



Planning &
Environment

**CRITICAL STATE SIGNIFICANT
INFRASTRUCTURE ASSESSMENT:
Inland Rail – Parkes to Narromine
CSSI 7475**



Environmental Assessment Report under
Section 5.18 of the
Environmental Planning and Assessment Act 1979

June 2018

Cover Photograph: A double stacked freight train (Source: EIS)

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EXECUTIVE SUMMARY

The Proposal

Australian Rail Track Corporation (ARTC - the Proponent), proposes to construct the Parkes to Narromine proposal (the proposal) as part of the Inland Rail program of works. Inland Rail is a 1,700 kilometre rail freight corridor designed to improve connections between the Ports of Melbourne and Brisbane via the Riverina, Central West and North West NSW. The proposal is the first stage of Inland Rail in NSW. The component projects of Inland Rail in NSW are summarised in the table below.

| Component | Approval Authority | Current Status |
|------------------------------|--|---|
| Albury to Illabo | The Proponent | NA |
| Illabo to Stockinbingal | Department of Planning and Environment | No application has been lodged with the Department |
| Stockinbingal to Parkes | The Proponent | NA |
| Parkes to Narromine | Department of Planning and Environment | The subject of this Report |
| Narromine to Narrabri | Department of Planning and Environment | No application has been lodged with the Department |
| Narrabri to North Star | Department of Planning and Environment | The Proponent is preparing a Submissions Report |
| North Star to NSW/QLD border | Department of Planning and Environment | Application lodged with the Department on 24 May 2018 |

The proposal involves the upgrade of the existing 106 kilometre rail corridor between the towns of Parkes and Narromine via Peak Hill, and the construction of a 5.3 kilometre greenfield rail corridor to the west of Parkes to connect the upgraded corridor to the Broken Hill rail line. It also includes the construction of three new crossing loops at Goonumbra, Peak Hill and Timjelly. Construction of the proposal would take 18 months and become operational in 2020. Subject to the granting of project approvals for each component, the wider Inland Rail program is expected to be operational in 2025.

Need and Justification

The NSW freight network supports economic growth in NSW by connecting regional NSW to domestic and international markets. However, the existing north-south rail line is constrained as it travels through the congested Sydney network and circuitous coastal route, bypassing some of the State's most productive agricultural regions. Inland Rail will provide benefits not only to NSW but also to the nation by providing a freight link between Melbourne and Brisbane which would see freight delivered between the two capital cities in less than 24 hours, with reliability and availability that is equal to or better than road. The link will also cater for the projected economic growth in the eastern states.

The Department considers that the Parkes to Narromine proposal is justified in its own right as it will increase the current capacity of the freight rail network in regional NSW and provide a link to the existing Broken Hill rail line, allowing a continuous movement of freight to and from the west to the north-south freight corridor. Specifically, the proposal will:

- unlock future economic potential in the region;
- support the regional agricultural industry;
- provide crossing loops for trains to pass, thereby reducing waiting times along other lengths of the rail corridor and consequently improve efficiencies in freight movements;
- improve the flood immunity of the rail corridor, reducing the number of track closures; and
- create employment opportunities (approximately 150 full-time construction jobs) and have economic flow-on effects for businesses supplying directly to the proposal.

State Significant Infrastructure

The proposal is State significant infrastructure (SSI) and has also been declared critical State significant infrastructure (CSSI) because it is deemed essential for the State. The Minister for Planning is the approval authority.

Consultation

The Environmental Impact Statement (EIS) was publicly exhibited from Wednesday 19 July 2017 until Friday 18 August 2017 (a total of 31 days). A total of 23 submissions were received. Sixteen public submissions were received from 15 individual submitters. Two submissions were received from local councils and five submissions from State government agencies.

Key issues raised in the submissions included:

- noise and vibration;
- flooding and water quality;
- calculation of biodiversity impacts;
- closure of and changes to level crossings and consequent impacts on property access;
- impact on property values; and
- amenity impacts including construction, air quality, and visual impacts.

Following the exhibition period, the Department of Planning and Environment directed the Proponent to prepare a response to the submissions. The Proponent provided a Submissions Report which addressed the issues raised in the submissions and changes to the proposal since the exhibition of the EIS. The Submissions Report was published on the Department's website on 12 February 2018.

The Department has undertaken and participated in stakeholder and community consultation as part of its assessment of the proposal. This has included engagement with Parkes and Narromine Shire Councils. The Department also met with Linfox Australia Pty Ltd (Linfox) at the National Logistics Hub in Parkes to understand the proposal from a freight transport business perspective. In addition, consultation was undertaken with a member of the NSW Farmers Federation in Parkes to understand the benefits and concerns relating to the proposal from an agricultural perspective.

The Department considers that community engagement should be continued throughout the detailed design and construction of the proposal. Consequently, the recommended conditions of approval provide for the preparation and implementation of a Communication Strategy which addresses how and when the community will be consulted. The community would also be consulted on the upgrade and consolidation of private level crossings.

Key Assessment Issues

Noise and Vibration

Noise and vibration impacts are expected to occur throughout the construction of the proposal, not only along the length of the rail corridor but also around construction ancillary facilities. As much of the rail corridor is located outside of residential areas, noise and vibration impacts will be restricted to localities where the rail line is adjacent to the town centres of Peak Hill and Narromine.

The Proponent has committed to a range of mitigation measures to reduce construction noise and vibration impacts and the Department is supportive of these measures. However, the Department considers that the Proponent must be more proactive in its management of noise impacts, particularly as works are proposed to be undertaken outside of standard construction hours. Of particular concern is the need to address highly noise affected receivers and the management of respite periods. Consequently, the Department has recommended conditions regulating the hours of work and periods of respite, which would be managed through the

preparation and implementation of a Construction Noise and Vibration Management Sub-plan. Out-of-hours works would also be regulated under an Environment Protection Licence. The Department has also recommended the implementation of operational noise management measures within six months of the commencement of construction to further reduce construction noise impacts.

To manage noise impacts once the proposal is operational, at-property treatments are proposed where noise levels are predicted to exceed the noise criteria detailed in the *Rail Infrastructure Noise Guideline* (EPA, 2013). The Department has also recommended the implementation of an Operational Noise Management Plan to ensure that noise and vibration levels generated by the operation of the proposal would comply with noise criteria specific to the proposal.

Biodiversity

The proposal was referred to the Commonwealth Department of the Environment and Energy who determined it to be a 'controlled action' under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* due to the potential impact on listed threatened species and communities. These species include the Koala, *Tylophora linearis*, Superb Parrot, Regent Honeyeater and Swift Parrot. The communities include *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*, and *Weeping Myall Woodlands*.

The proposal would result in the clearing of approximately 923 hectares of vegetation of which about 160 hectares is native vegetation that will require offsetting. The Department acknowledges the unavoidable impacts on areas of biodiversity value. However, it is considered that the proposal has avoided other areas of biodiversity significance by undertaking the majority of construction within the existing disturbed rail corridor.

The Proponent has developed a Biodiversity Offset Strategy (Phase 1) which identified methods for offsetting and has committed to finalising the strategy within 12 months of the commencement of construction. The Department has recommended that the Proponent must retire all biodiversity credits within 12 months of the approval of the Biodiversity Offset Strategy.

Flooding

A primary objective of the proposal is to decrease overtopping of the rail formation during flood events. The Proponent's flood modelling indicates that the existing rail formation currently overtops some seven kilometres in a 100 year ARI flood event. Following the upgrade works, the length of formation overtopped during a 100 year ARI flood event is predicted to be reduced by 94 per cent to about 406 metres. However, the proposal is predicted to increase the area of upstream flooding for all flood events exceeding the 50 year ARI flood event as well as increase flood levels immediately upstream of the rail formation, hence impacting on properties adjacent to the rail corridor.

To reduce the potential for adverse flood impacts, the Department has recommended maximum afflux levels and flood inundation times and placed limits on flow velocities exiting the rail corridor via culverts. The Department has also recommended conditions which require the Proponent to confirm the predicted flood impacts on completion of the detailed design.

While changes in the flood regime cannot be eliminated, the Department is satisfied that the recommended conditions of approval would assist in the management and mitigation of adverse flood effects on property and infrastructure resulting from the construction and operation of the proposal.

Construction Ancillary Facilities

The Proponent has assessed the potential establishment of construction ancillary facilities approximately every 4.5 to five kilometres along the alignment outside of the rail corridor on leased private property. The Department acknowledges that the establishment and operation of these facilities has the potential to impact on public amenity and access as well as biodiversity, water quality and heritage. To minimise the potential for adverse impacts to arise, the Department has recommended locational criteria and the need to prepare a site establishment management plan.

Spoil Management

An estimated 647,807 cubic metres of excess material, mainly from the excavation of track formation and cess drains, is proposed to be stockpiled within the existing rail corridor and then shaped and stabilised into permanent spoil mounds. There remains a degree of uncertainty regarding the spoil mounds, including their size, location, visual impact and potential effects on overland flow paths and flooding. Consequently, the Department has recommended strict establishment criteria which not only govern where the spoil mounds can be located, but also require the Proponent to ensure that placement of the mounds will not result in flooding, biodiversity and heritage impacts beyond those assessed.

Property and Land Use

The acquisition of land is an unavoidable impact of delivering major rail infrastructure projects where part of the proposal is proposed to be constructed within a greenfield area. However, the amount of land to be acquired has been minimised with most of the works being located within the existing rail corridor.

The proposal involves the potential consolidation of 17 private level crossings with consequent impacts on the movement of stock, machinery and equipment within properties that straddle the rail line. The Department has recommended the Proponent prepare a Private Level Crossing Treatment Report to document the outcomes of the consultation effort with impacted landowners, and describe and justify any proposed closures and upgrades of private level crossings. The Department considers this will facilitate greater community certainty around the process of consolidating level crossings.

Traffic and Access

The Department has considered traffic and transport impacts during the construction and operational stages. The key construction risk is the movement of construction vehicles on local and main roads. The busiest road in the vicinity of the proposal is the Newell Highway and the main route used by construction vehicles. The traffic assessment concluded the additional vehicles generated by the construction of the proposal would not reduce the existing level of service during the am and pm peak periods. Although construction traffic impacts will be unavoidable, they can be appropriately managed and would be addressed through the implementation of a Construction Traffic and Access Management Plan.

The operation of the proposal will increase train traffic which will impact on waiting times at level crossings depending on the length of trains and train speed. To ensure the effectiveness of level crossing treatments, the Department has recommended that the Proponent monitor the performance of level crossings at twelve months and ten years after the commencement of operation, and identify the need for additional treatment, if required.

Other Issues

The assessment concludes that relevant impacts of other issues such as groundwater, soils and contamination, water quality, air quality, greenhouse gas emissions and heritage can be appropriately managed through the implementation of mitigation measures and safeguards, as proposed in the EIS and as recommended by the Department.

Conclusions and Recommendations

The Parkes to Narromine proposal is a critical component of the Inland Rail program of works which in turn is key to achieving the Commonwealth Government's transport policy and objectives for providing an efficient national freight network. The proposal is justified by providing improved capacity and travel times for freight haulage and complementing road freight haulage.

The Department has assessed the Proponent's EIS, Submissions Report and submissions on the proposal and considers that there are a number of constraints to the proposal that will need to be carefully managed. These include construction noise, flooding, level crossing treatments, property and access, and biodiversity. Consequently, the Department has recommended conditions of approval in regards to these matters.

Overall, the potential environmental impacts associated with construction and operation would be acceptable subject to the implementation of appropriate mitigation measures. On balance, the benefits of the proposal outweigh its potential impacts and it is therefore in the public interest that the proposal proceeds.

The proposal would comply with the objects of the *Environmental Planning and Assessment Act 1979*. It would also comply with the principles of Ecologically Sustainable Development.

ABBREVIATIONS

| Abbreviation | Explanation |
|---------------------|---|
| AEP | Annual Exceedance Probability – the probability of a flood event occurring in any year, expressed as a percentage. For example a 1% AEP flood event has a 1% chance of occurring in any year and corresponds to a 1 in 100 ARI flood event. |
| AHIMS | Aboriginal Heritage Information Management System – an online database of all recorded Aboriginal heritage items |
| ALCAM | Australian Level Crossing Assessment Model – a computer model which assesses risk to trains from vehicle collisions at level crossings. |
| ARI | Average Recurrence Interval – the long-term average number of years between the occurrence of the selected flood event. For example, a 1 in 5 (or 1:5) ARI flood event would likely occur every 5 years, and a 1 in 20 ARI flood event would take place every 20 years. |
| ARTC | Australian Rail Track Corporation (the Proponent) |
| BC Act | <i>Biodiversity Conservation Act 2016</i> |
| CEEC | Critically Endangered Ecological Community |
| CEMP | Endangered Ecological Community |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| CSSI | Critical State Significant Infrastructure |
| dB | Decibel – a measure of sound level |
| dB(A) | Unit used to measure ‘A-weighted’ sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear. |
| DoEE | Commonwealth Department of the Environment and Energy |
| DPI | NSW Department of Primary Industries |
| DSPG | <i>Dark Sky Planning Guideline (DPE, 2016)</i> |
| EEC | Endangered Ecological Community |
| EIS | Environmental Impact Statement |
| EP&A Act | <i>Environmental Planning and Assessment Act 1979 (NSW)</i> |
| EPA | NSW Environment Protection Authority |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i> |
| EPL | Environment Protection Licence – regulated by the EPA |
| ESD | Ecological Sustainable Development |
| FBA | <i>NSW Framework for Biodiversity Assessment (OEH, 2014)</i> |
| GDE | Groundwater Dependent Ecosystem |
| ICNG | Interim Construction Noise Guideline (DECC, 2009) |
| Infrastructure SEPP | <i>NSW State Environmental Planning Policy (Infrastructure) 2007</i> |
| LGAs | Local Government Areas – also known as the area which a local or shire council controls |
| m/s | Metres per second |
| NMLs | Noise Management Levels – specified in the ICNG |
| NSW | New South Wales |
| OEH | NSW Office of Environment and Heritage |
| ONVR | Operational Noise and Vibration Review |
| PCT | Plant Community Types |
| RING | Rail Infrastructure Noise Guideline (EPA, 2013) |
| RMS | Roads and Maritime Services |
| SRD SEPP | <i>NSW State Environmental Planning Policy (State and Regional Development) 2011</i> |
| SSI | State Significant Infrastructure |
| TAP | Threat Abatement Plan |
| TfNSW | Transport for New South Wales |

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In May 2017, the Australian Government announced (as part of the 2017-2018 budget) its commitment to the full delivery of Inland Rail programme with an additional \$8.4 billion equity investment in the Australian Rail Track Corporation (ARTC). This was followed in May 2018 with the signing of a Bilateral Agreement by the Federal and State Governments which provides guiding principles for the delivery of Inland Rail in NSW. Inland Rail is a series of freight rail projects, to be delivered by ARTC, which when completed will form a 1,700 kilometre, high-capacity freight rail network, between Melbourne and Brisbane (**Figure 1**).



It is anticipated that by 2040 Inland Rail will carry 15 double deck 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 freight, and other general 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).

The Inland Rail Programme is being delivered as 13 separate projects, seven of which will be in NSW. The Parkes to Narromine proposal is the first component to be delivered.

The Parkes to Narromine proposal spans the Parkes and Narromine Local Government Areas (LGAs) in central west NSW. Land uses along the route alignment include:

- existing rail track infrastructure within the current rail corridor;
- light industrial uses at Parkes, including the Parkes Logistics Hub;
- agriculture (cropping and livestock grazing);
- residential and urban development surrounding the towns of Parkes, Peak Hill and Narromine, and the hamlet of Alectown;
- mining and quarrying near the town of Peak Hill; and
- travelling stock reserves.

2. THE PROPOSAL

2.1. Description of the Proposal

The Parkes to Narromine proposal comprises the upgrade of approximately 106 kilometres of the existing rail freight line between Parkes and Narromine, and the construction of a 5.3 kilometre-long rail spur connecting the proposal to the existing Broken Hill line west of Parkes. It includes the upgrade of existing culverts, construction of new culverts in new locations, track reconstruction and realignment within the existing rail corridor, three new passing loops and two new level crossings. The northern end of the proposal is located south of the intersection of Old Blackwater Road and the railway line, approximately 500 metres south west of Narromine. The southern end of the proposal is located west of Parkes near where Brolgan Road crosses the existing railway. The proposed alignment is shown in **Figure 2**. The key components and operational features of the proposal are described in **Table 1**.

2.2. Construction Works

Construction of the proposal, if approved, is expected to take 18 months commencing in 2018 and continuing through to late 2019. The work would be carried out in three parts:

- Part 1 is from Parkes to Goonumbla;
- Part 2 is from Goonumbla to Narwonah; and
- Part 3 is from Narwonah to south of Narromine.

Construction of the Parkes North-West Connection to the Broken Hill line would occur in parallel with Stages 1 and 2. The indicative construction program is shown in **Table 2**.

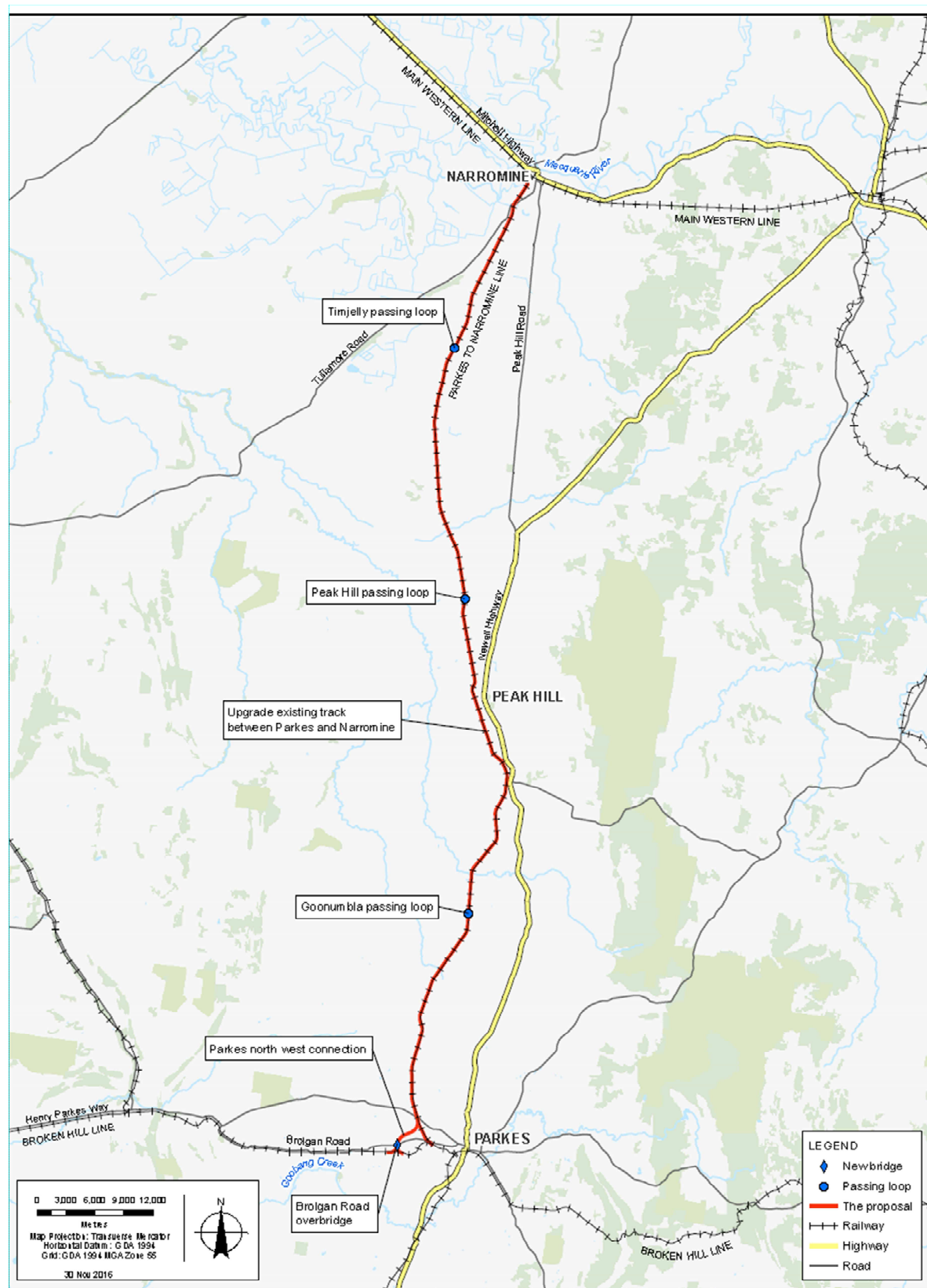


Figure 2: Proposal Alignment (Source: EIS)

Table 1: Key Components of the Proposal

| Aspect | Description |
|-------------------------------|---|
| Track reconstruction | <ul style="list-style-type: none"> Replacement of existing track and formation for a distance of approximately 14 kilometres |
| Skim reconditioning | <ul style="list-style-type: none"> Proposed for a distance of approximately 37 kilometres Involves using the existing track ballast and sub-ballast as structural capping on the existing consolidated subgrade |
| Skim plus reconditioning | <ul style="list-style-type: none"> Combination of skim reconditioning and track reconstruction for a distance of approximately 55 kilometres |
| Culvert upgrading | <ul style="list-style-type: none"> Replacement or upgrade of 165 culverts and construction of 60 new culverts |
| Passing loops | <ul style="list-style-type: none"> Construction of three approximately 2.3 kilometre new passing loops at Goonumbla, Peak Hill and Timjelly parallel to the existing track |
| Turn outs | <ul style="list-style-type: none"> Turn outs at either end of the passing loops to allow trains to be guided from one track to another |
| Parkes North -West Connection | <ul style="list-style-type: none"> New rail link between Inland Rail and the existing Broken Hill rail line Approximately 5.3 kilometres of new track and formation, including three turnouts, four culverts, and two new level crossings |
| Track drainage | <ul style="list-style-type: none"> Cess drains would be located within the rail corridor adjacent to the track |
| Spoil mounds | <ul style="list-style-type: none"> Excess spoil would be formed into permanent spoil mounds adjacent to the track, with a maximum height of two metres |
| Level crossings | <ul style="list-style-type: none"> Existing level crossings would be retained, refurbished, or decommissioned Upgrade of signalling and communications |
| Ancillary works | <ul style="list-style-type: none"> Signalling and communications, signage, fencing, and services and utilities works |

Table 2: Indicative Construction Program (Source: EIS)

| Work phase | Q2 2018 | | | Q3 2018 | | | Q4 2018 | | | Q1 2019 | | | Q2 2019 | | | Q3 2019 | | |
|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|---------|--|--|
| Mobilisation and site establishment | | | | | | | | | | | | | | | | | | |
| Stage 1 – Parkes to Goonumbla | | | | | | | | | | | | | | | | | | |
| Stage 2 – Goonumbla to Narwonah | | | | | | | | | | | | | | | | | | |
| Stage 3 – Narwonah to Narromine | | | | | | | | | | | | | | | | | | |
| Parkes North-West Connection | | | | | | | | | | | | | | | | | | |
| Signalling | | | | | | | | | | | | | | | | | | |
| Testing and commissioning | | | | | | | | | | | | | | | | | | |
| Demobilisation and finishing works/reinstatement | | | | | | | | | | | | | | | | | | |

The Proponent proposes to upgrade the existing rail line between Parkes and Narromine via a combination of track reconstruction, skim reconditioning, and skim plus reconditioning. These methods are shown in **Figure 3**, **Figure 4** and **Figure 5**.

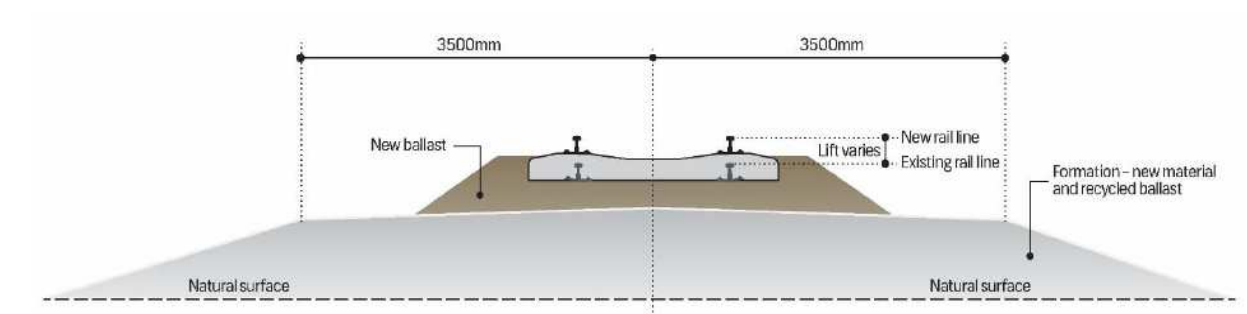


Figure 3: Track Reconstruction (Source: EIS)

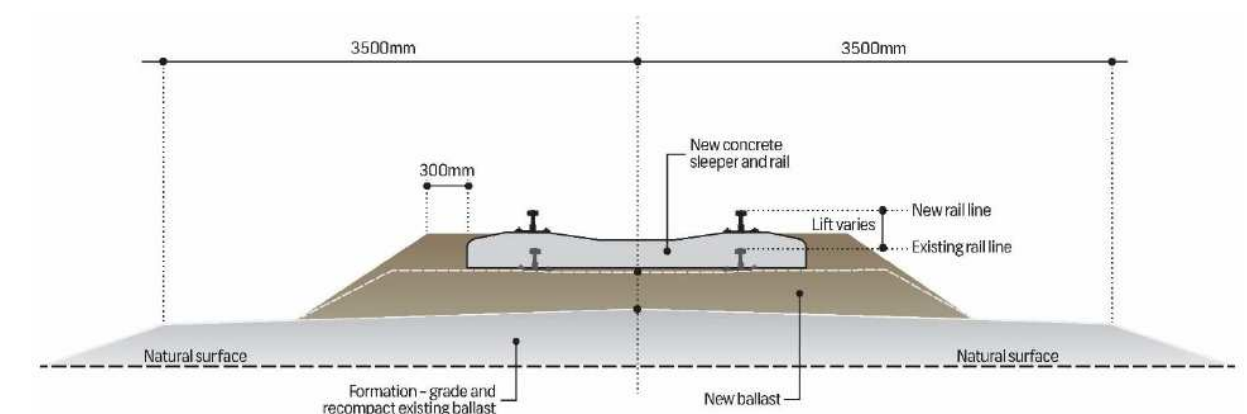


Figure 4: Skim Conditioning (Source: EIS)

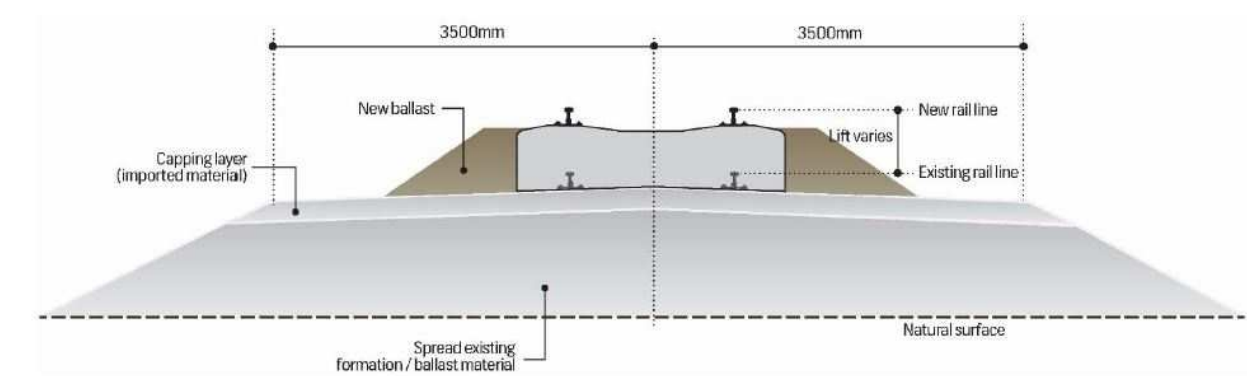


Figure 5: Skim plus Reconditioning (Source: EIS)

A number of construction ancillary facilities (compounds) would be required to construct the proposal. Minor construction ancillary facilities would be located within the rail corridor and would be used for the assembly of adjacent infrastructure such as culverts and turnouts. Larger construction ancillary facilities would be used for stockpiles, laydown areas, refuelling areas, portable offices, and hazardous materials storage and located outside the rail corridor.

2.3. Need and Justification for the Proposal

Inland Rail Programme

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).

The Department is satisfied that construction of Inland Rail will result in economic benefit being realised in rural and regional areas of NSW. Modelling indicates a positive net benefit on the NSW Gross State Product of \$2.6 billion with benefits predominantly flowing to northern and western NSW (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 the freight task, which is projected to increase by 70 per cent by 2030. The Melbourne to Brisbane freight task is currently dominated by road which accommodates approximately 100,000 truck trips per year. The completed Inland Rail Programme will remove approximately 160 trucks for every train between Melbourne and Brisbane, minimising network congestion and improving safety for road users (ARTC, 2015).

At ultimate capacity, Inland Rail would provide a rail line between the ports of 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). By-passing Sydney would not only reduce travel times but also free up coastal rail paths through Sydney for both passenger and freight rail services.

Inland Rail is identified as a committed initiative in the NSW Government's *Future Transport Strategy 2056* and supporting plan, *Regional NSW Services and Infrastructure Plan (2018)*. In particular, the *Regional NSW Services and Infrastructure Plan* recognises the importance of Inland Rail in optimising the movement of freight in regional NSW and providing opportunities for the establishment of economically sustainable intermodal hubs along its alignment through inland NSW.

North-south freight movements facilitated by Inland Rail will provide opportunities for improved movements of freight to ports and also provide relief for the coastal road and rail networks which will continue to experience growth in flows dominated by passenger movements.

Parkes to Narromine

The Parkes to Narromine proposal would contribute to improved freight transport outcomes by increasing the current capacity of the freight network. The provision of increased capacity has the added benefit of unlocking future economic potential in the region and supporting the regional agricultural industry. The upgraded track will also improve safety and reliability along the rail corridor.

The proposal is also justified in its own right in that it would provide a link to the existing Broken Hill rail line allowing a continuous movement of freight to and from the west to the north-south freight corridor.

The construction of three passing loops will provide efficiencies in freight movements by providing additional lengths of track for trains to pass, thereby reducing waiting times along other lengths of the rail corridor. Upgrading of the track formation and straightening of tight

curves will allow for increased train speeds, thus 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 number of track closures hence improving the efficiency of freight movements.

Construction of the proposal is expected to create approximately 150 full-time construction jobs.

The Department is of the opinion that the proposal is strategically justified and consistent with the State and Federal governments' commitment to creating regional jobs and economic growth and providing increased freight capacity and infrastructure, as identified through several strategies and initiatives including:

- **Future Transport Strategy 2056 (2018)** – Inland Rail is recognised as part of the solution to improving freight movements;
- **Regional NSW Service and Infrastructure Plan (2018)** – Inland Rail is listed as a key initiative which provides a once-in-a-generation opportunity to reconfigure the regional freight network in NSW;
- **State Infrastructure Strategy 2018-2038 (2018)** – the Strategy reiterates the importance of Inland Rail in improving intercity and intracity general and freight transport connections and providing improved travel times and increased network capacity;
- **New South Wales Freight and Ports Strategy (2013)** – the Parkes to Narramine proposal is consistent with the strategic action programs which include developing a seamless interstate freight network and improve productivity of the rail freight network;
- **Australian Infrastructure Plan: The Infrastructure Priority List (2016)** - Inland Rail (and its component projects) is listed as a “high priority initiative”;
- **National Land Freight Strategy (2012)** - the proposal is consistent with the Strategy's objective to improve the efficiency of freight movements across infrastructure networks;
- **Central West Freight Strategy (Regional Development Australia, 2014)** – Inland Rail is strongly supported by the Central West Freight Strategy as it would provide a viable alternative for freight travelling along the Newell Highway; and
- **Central West and Orana Regional Plan (2017)** – the proposal is consistent with the Plan's vision which includes improved transport connections, improved capacity and connectivity for agribusiness, manufacturing, and mining, and investment in logistics facilities to provide a more efficient network and make the region a nationally significant freight hub.

As noted, the proposal forms part of the Inland Rail Programme and the identified benefits of the proposal would be maximised with the implementation of this wider programme. Whilst applications for the other NSW based sections of Inland Rail have not been assessed, the Department is satisfied with the standalone benefits of the proposal.

2.4. Development of the Proposal and Alternatives

The Environmental Impact Statement (EIS) considers the merits of the proposal in the context of a number of alternative options, including:

- 'do nothing';
- alternative freight transport solutions – maritime freight, air freight, road freight; and
- alternative rail solutions.

The assessment also 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 Barrabri, Gwabergar and Narrabri, or Coonamble and Burren Junction), and two main options between Moree and Brisbane (via Warwick or Toowoomba).

Alternative 1 - '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 consistent with the State and Federal governments' commitments regarding creating regional jobs and economic growth in NSW, and the provision of increased freight capacity and infrastructure. This option is also not consistent with the above listed strategies and initiatives.

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 freight, air freight and/or road freight. The Proponent's strategic options assessment *ARTC 2015 Inland Rail Programme Business Case* (the Business Case) 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 to the Australian Government* (2015) 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 Business Case for Inland Rail and *Inland Rail Implementation Group Report* assessed the feasibility of upgrading the existing east coast railway and constructing a new inland railway. The Department acknowledges the constraints associated with moving freight trains through the existing 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 has provided a considered balance between environmental costs and benefits, engineering constraints, railway operational requirements and economic viability. The Parkes to Narromine proposal largely involves the upgrade of existing track thereby minimising potential environmental impacts that would otherwise be associated with a greenfield site. The Department is also satisfied that the location of the Parkes North-West Connection to the Broken Hill line provides the best outcome in terms of operational benefits, environmental impacts and capital costs.

3. STATUTORY CONTEXT

3.1. State Significant Infrastructure

The proposal is development specified in Schedule 3 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP), i.e. development for the purpose of rail infrastructure by or on behalf of the ARTC that has a capital investment value of more than \$50 million. The proposal is therefore State significant infrastructure under section 5.12 of the EP&A Act.

3.2. Critical State Significant Infrastructure

The proposal is critical State significant infrastructure (CSSI) pursuant to Section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposal was declared CSSI on 20 October 2017. The Minister for Planning is the approval authority for the proposal.

3.3. Permissibility

The proposal is development permitted without consent, in accordance with clause 79 of *State Environmental Planning Policy (Infrastructure) 2007*.

3.4. Environmental Planning Instruments

In accordance with Section 5.22(2) of the EP&A Act, the only environmental planning instruments that apply to the proposal are *State Environmental Planning Policy (Infrastructure) 2007* (insofar as it relates development that does not require consent) and SRD SEPP (as it pertains to the declaration of infrastructure as SSI). There are no other environmental planning instruments that substantially govern the carrying out of the proposal.

3.5. 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 given consideration to the objects of the EP&A Act including:

- economic sustainable development (see **Sections 2 and 5**);
- social and economic welfare (see **Section 5**);
- protection of the environment, including in relation to biodiversity, flooding, traffic, noise and vibration, amenity and socio-economic issues (see **Section 5**);
- sustainable management of built and cultural heritage, including Aboriginal cultural heritage (see **Section 5**);
- amenity of the built environment (see **Section 5**);
- the principles of ecologically sustainable development (ESD) (see **Section 3.6**);
- promote the sharing of the responsibility for environmental planning and assessment between the different levels of government (see **Section 4**); and
- community participation in the assessment of the proposal (see **Section 4**).

3.6. 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 has addressed the above principles directly in the Environmental Impact Statement (EIS) and has identified a broad range of mitigation measures to manage impacts associated with these issues. The Department is satisfied with the measures and considers that the valuation and pricing of the environmental resources associated with the proposal have been adequately undertaken and internalised through the proposal design and mitigation measures.

The EIS has considered the precautionary principle to address potential risks through the selection of the preferred option, which avoids to the greatest extent possible impacts to known areas or items of environmental value. However, it is acknowledged that the proposal would impact on areas of *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (critically endangered ecological community -CEEC), *Grey Box (Eucalyptus macrocarpa) Grassy Woodland and Derived Native Grassland of South-eastern Australia* (endangered ecological community - EEC), *Weeping Myall Woodlands* (EEC), known foraging habitat of the Koala and Superb Parrot, potential foraging habitat for the Swift Parrot and Regent Honeyeater, and potential habitat for the flora species *Tylophora linearis*. The Proponent has developed measures for managing the impacts to the threatened species and ecological communities. The Department considers that the proposed mitigation measures are appropriate and commensurate with the degree of impact and its assessment of this issue is provided in **Section 5.2**.

The assessment of the proposal has considered the impacts of the proposal in terms of inter-generational equity and notes that it would provide benefits for current and future generations in terms of efficiencies in freight movements which in turn provide a direct economic benefit to the State, especially regional NSW.

To assist in achieving sustainable outcomes, the Department has recommended that the proposal achieve a minimum "Excellent" 'Design' and 'As built' rating under the Infrastructure Sustainability Council of Australia infrastructure rating tool (or through the use of an equivalent process).

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

3.7. Environment Protection and Biodiversity Conservation Act 1999

On 11 October 2016, the Commonwealth Department of the Environment and Energy (DoEE) determined the proposal to be a 'controlled action' under Section 18 of the Commonwealth *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 or endangered communities.

Following notification from the Commonwealth of the decision that the proposal is a controlled action, the Department confirmed that the proposal would be assessed in the manner specified in Schedule 1 to the NSW Assessment Bilateral Agreement (February 2015). Under this agreement, the Commonwealth has accredited the assessment process under the former Section 5.1 (now Division 5.2) of the EP&A Act for the purposes of the EPBC Act, enabling a single assessment of the proposal. Note that an approval decision under the EPBC Act is still required by the Commonwealth decision-maker. Accordingly, NSW has conducted an assessment of the potential impacts on the relevant Matters of National Environmental Significance in accordance with the requirements of the bilateral agreement.

The relevant controlling provision of the EPBC Act is threatened species and ecological communities. The assessment of Matters of National Environmental Significance is provided in **Section 5.2** of this report and includes 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. CONSULTATION AND SUBMISSIONS

4.1 The Department's Community Consultation Process

The Department has undertaken and participated in stakeholder and community consultation as part of its assessment of the proposal. This has included meeting with Narromine and Parkes Shire Councils in May 2017 to discuss the proposal and gain an understanding of local and regional constraints and issues, community concerns and how the proposal might interact with local projects and initiatives. The Department also met with Linfox Australia Pty Ltd (Linfox) at their depot at the National Logistics Hub in Parkes to understand the proposal from a freight transport business perspective. In addition, consultation was undertaken with a representative of the NSW Farmers Federation in Parkes to understand the benefits and concerns relating to the proposal from an agricultural perspective.

Ongoing engagement with agencies and councils has also occurred during the assessment process. The Department has considered the issues raised during the engagements and in the submissions as part of its assessment.

The Department considers that community engagement should be ongoing throughout the construction of the proposal. Consequently, the recommended conditions of approval require the preparation and implementation of a Communications Strategy which details the types of consultation that must be undertaken by the Proponent during the construction of the CSSI.

4.2 Exhibition of the EIS

Under Schedule 1 of the EP&A Act, the Department is required to make the EIS publicly available for a minimum period of 28 days. The Department exhibited the EIS (**Appendix A**) from Wednesday 19 July 2017 until Friday 18 August 2017 (a total of 31 days). The EIS was published on the Department's website, and also made available for viewing at the following locations:

- Department of Planning & Environment, Dubbo Regional Office – Area 1, Level 1, 188 Macquarie Street, Dubbo;
- Australian Rail Track Corporation (Head Office) – Level 15, 60 Carrington Street, Sydney
- Parkes Shire Council: Administration Centre – 2 Cecile Street, Parkes
- Narromine Shire Council: Administration Building – 124 Dandaloo Street, Narromine
- Peak Hill Library: 98 Caswell Street, Peak Hill;
- Nature Conservation Council of NSW: Level 14, 338 Pitt Street, Sydney; and
- Service NSW centres.

The Department advertised the public exhibition in the Sydney Morning Herald, Daily Telegraph, Parkes Champion Post, The Australian, Dubbo Daily Liberal, Narromine News, and The Land. The Department also notified State and relevant local government authorities of the exhibition in writing.

A total of 23 submissions were received. Sixteen public submissions were received from 15 individual submitters (**Appendix B**). Five submissions were received from government agencies and two from local councils. A summary of the key issues raised in the submissions is presented in **Sections 4.3, 4.4 and 4.5**.

4.3 Submissions from the Public on the EIS

Of the sixteen public submissions received, three objected to the proposal. The main issues raised in public submissions were:

- higher levels of, and more frequent, noise resulting from increases in the number of train movements and upgraded level crossing infrastructure;
- impact of the proposal on the value of properties adjoining the rail corridor due to increased noise and reduced rural amenity; and
- concerns around level crossing works, including their consolidation being incompatible with the operations of adjoining properties, and safety concerns about their close proximity to a school bus stop.

The **Siding Spring Dark Sky Committee** made a submission on behalf of the Australian Astronomical Observatory, the Australian National University, and other stakeholders on the Siding Springs site. They commended the Proponent for their cooperation and engagement with them regarding the proposal, and reiterated that the good lighting principles outlined in the *Dark Sky Planning Guideline* must be followed during the construction and operation of the proposal.

4.4 State Government Agency Submissions on the EIS

Five submissions were received from State government agencies. None of the agencies objected to the proposal, however, they did raise issues for the Department's consideration including biodiversity, noise, water quality, modifications to level crossings and traffic.

The **Department of Primary Industries'** (DPI) submission included a request for the Proponent to confirm water supply requirements and undertake further detailed modelling of the hydrological impacts of the proposed culverts. DPI also raised concerns regarding the potential impacts of activities associated with construction compounds on waterfront land.

The **Environment Protection Authority's** (EPA) raised concern over the proposed construction hours, the adequacy of the noise and vibration assessments, and management of surface and reused mine water.

Transport for NSW (TfNSW) expressed concerns about the safety and efficiency of increased freight movements at level crossings, impacts of increased rail noise in Parkes, and noted the EIS crash data was outdated and did not consider level crossing crashes. TfNSW requested the Proponent prepare further assessments of the interactions of the proposal with the level crossings on Henry Parkes Way the Newell Highway, and The McGranes Way.

The **Office of Environment and Heritage** (OEH) highlighted gaps in the Proponent's flooding assessment, and raised concerns regarding impacts to biodiversity values including the impact assessment methodology, categorisation of temporary impacts, and the use of vegetation mapping.

Water NSW had no particular comments or requirements as the proposal would not impact any Water NSW land, assets or infrastructure.

4.5 Local Government Submissions

Parkes Shire Council indicated support for the proposal but noted it was unable to properly consider the proposal until the detailed designs are finalised. The Council requested the Proponent provide timeframes for stakeholder consultation regarding level crossings, and consider how impacts to the condition of local roads will be mitigated. Council also commented on the presence of council-owned public utilities in the area associated with the Parkes North-West Connection, and reiterated the need for any impact to be fully detailed.

Narromine Shire Council stressed the need for the Proponent to consult with Council on mitigating the proposal's potential impacts to the condition of local roads. The Council also highlighted gaps and generalisations in the EIS surrounding existing road network usage, noise, property access requirements, spoil mounds, flooding, and cropping land requirements.

4.6 Proponent's Response to Submissions

Following completion of the formal exhibition period, the Department directed the Proponent to prepare a response to the submissions received. As part of this process, the Proponent reviewed each submission and made specific comment on each of the issues. The Submissions Report (**Appendix C**) was made publicly available on the Department's website on 12 February 2018.

Four State government agencies (EPA, Transport for NSW, OEH and DPI) and two local government councils (Parkes and Narromine Shire Councils) provided comments on the Submissions Report. The State government agencies and councils reiterated a number of the issues raised in their original submissions and recommended conditions of approval, should the proposal be approved. New or residual issues raised by State government agencies and councils included:

- impacts to local roads from construction traffic or proposed road closures (Parkes and Narromine Shire Councils);
- impacts to agricultural land from increased or redirected flooding (Narromine Council);
- lack of clear justification, other than convenience, for construction hours outside the recommended standard construction hours in the *Interim Construction Noise Guideline* (ICNG - Department of Environment and Climate Change, 2009) (EPA);
- management and mitigation of construction noise impacts (EPA);
- water extraction points should be confirmed and any relevant approvals obtained (DPI);
- need for grade separation of level crossings on State Roads (Transport for NSW); and
- adequacy of the survey effort carried out to inform the proposal's biodiversity offset liabilities (OEH).

The Submissions Report proposed and assessed several minor changes to the proposal from what was proposed in the EIS. As these changes were minor, the Department advised the Proponent that a Preferred Infrastructure Report was not required. The proposed changes included:

- the addition of 60 new culverts to the rail alignment between Parkes and Narromine, on top of the existing 165 culverts proposed for replacement; and
- replacement of the proposed Brolgan Road Overbridge with two level crossings – one on Brolgan Road (near Coopers Road), and the second on Coopers Road between the existing Broken Hill Rail Line and Brolgan Road – to enable Coopers Road to remain open.

The residual issues raised by the State government agencies and councils, and the Proponent's proposed changes to the proposal, have been considered by the Department in its assessment and are addressed in **Chapter 5**.

5. ASSESSMENT

5.1. Noise and Vibration

Issue

The existing environment along the proposal alignment is predominantly rural and characterised by low background noise levels. Areas adjacent to State and local roads are subjected to traffic noise while those adjacent to the rail line are subjected to intermittent rail noise. The area around the Parkes North-West Connection is subject to low levels of noise generated from operations at the Parkes Intermodal Facility.

A noise assessment was undertaken by the Proponent in accordance with the NSW Government noise guidelines, and included the prediction of worst-case noise scenarios across the length of the proposed alignment. Sensitive receivers are focused around the towns of Peak Hill and Narromine.

Construction Noise

The Proponent has proposed that construction/works would be undertaken between the hours of 6:00 am and 6:00 pm Monday to Sunday. This is not consistent with the standard construction hours set out in the ICNG, (2009). In addition, it is proposed that works associated with the existing rail line would be undertaken 24 hours a day during rail corridor possessions. The number, duration and frequency of rail corridor possessions is yet to be finalised but individual possessions could extend for periods of up to three months.

An assessment of potential construction noise impacts was undertaken in accordance with the ICNG. The ICNG outlines Noise Management Levels (NMLs) that are used to assess the impact at a sensitive receiver. The number of sensitive receivers predicted to be impacted by noise levels above the NMLs are set out in **Table 3**. The Proponent has committed to managing construction noise through its Inland Rail NSW Construction and Noise and Vibration Framework (the Noise Framework).

Table 3: Number of Sensitive Receivers Predicted to Experience Noise Levels above NMLs

| Construction Activity | Number of Impacted Receivers | Level of Exceedance |
|--------------------------------------|---|---|
| Track works | 29 between Parkes and Peak Hill 123 at Peak Hill 76 between Peak Hill and Narromine Total = 228 | Up to 27 dB Up to 30 dB Up to 33 dB |
| Culvert works | 23 between Parkes and Peak Hill 119 at Peak Hill 67 between Peak Hill and Narromine Total = 209 | Up to 10 dB Up to 18 dB Up to 25 dB |
| Crossing loops | 1 between Parkes and Peak Hill 105 at Peak Hill 7 between Peak Hill and Narromine Total = 113 | Up to 2 dB Up to 17 dB Up to 18 dB |
| Level crossing upgrades and removals | 9 between Parkes and Peak Hill 37 at Peak Hill 14 between Peak Hill and Narromine Total = 60 | Up to 13 dB Up to 24 dB Up to 19 dB |
| Parkes North-West Connection | Total = 18 | Up to 18 dB |

The Proponent undertook an assessment of the cumulative noise impacts of concurrent construction scenarios that may occur in the Submissions Report. The assessment predicted the following exceedances:

- between Parkes and Peak Hill – at 68 receivers, with exceedances up to 30 dB(A);
- within Peak Hill – at 317 receivers, with exceedance up to 34 dB(A); and
- between Peak Hill and Narromine – at 338 receivers, with exceedances up to 36 dB(A).

Sleep disturbance

The Submissions Report predicted the sleep disturbance screening criterion (i.e. rating background level plus 15 dB(A)) is likely to be exceeded for all construction scenarios. The most significant exceedances would be during the construction of the rail line and installation of new or replacement culverts. The number of sensitive receivers that would be subjected to exceedances of the sleep disturbance criteria are presented **Table 4**.

Table 4: Sleep Disturbance (Source: Submissions Report)

| | INP Sleep Disturbance Criteria | |
|--|---|---|
| | Number of sensitive receivers experiencing exceedances | Maximum predicted exceedance above the criterion (dB(A)) |
| Full alignment works | 294 | 33 |
| Level Crossing works – Signalised crossing | 59 | 24 |
| Level Crossing works – Give Way crossing | 20 | 21 |
| Level Crossing works – removal | 9 | 13 |
| Culvert works | 264 | 25 |
| Crossing loops | 135 | 18 |
| Post construction | 99 | 28 |
| Parkes North-West Connection – establishment | 9 | 14 |
| Parkes North-West Connection – earth works | 23 | 28 |
| Parkes North-West Connection – track works | 9 | 14 |

Construction Vibration

The main sources of construction vibration would be excavation, rolling and compaction works. The Proponent has indicated that construction vibration is unlikely to result in structural damage to residential buildings due to their distance from the vibration-generating activities (i.e. greater than the recommended buffer of 18 metres). There are a number of potential heritage structures (Wyanga cottage, rail stations, sidings and silos) within the recommended vibration buffer distances. Although vibration damage is not anticipated for the rail-related structures, there is the potential for Wyanga Cottage (located approximately 15 metres to the west of the existing rail line) to be impacted.

There is the potential for construction vibration to be perceptible at distances of up to 303 metres from the works. There are 42 residential receivers within this buffer distance.

Operational Noise

The EPA's *Rail Infrastructure Noise Guideline (2013)* (RING) includes noise trigger levels which the Proponent has adopted as its operational design objectives. The noise trigger levels include noise averaged over a time period, and maximum noise emitted.

The noise assessment predicted that the RING trigger levels would be exceeded at 28 sensitive receivers (refer **Figure 6** to **Figure 11**) along the Parkes to Narromine line between 2025 and 2040:

- one receiver in Parkes;
- 16 receivers in Peak Hill;
- three receivers in Tomingley; and
- eight receivers in Narromine.

The operation of the Parkes North-West Connection would not result in exceedances of the RING trigger levels at any sensitive receivers.

The noise assessment found the use of 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 90 dB(A) low noise level horn, or within 100 metres of a 85 dB(A) low noise level horn. Specific mitigation measures for affected sensitive receivers would be determined during detailed design.

The Submissions Report included an assessment of noise impacts from bells and whistles associated with level crossings. The assessment found the use of bells and whistles would increase operational noise levels by a maximum of one decibel. No additional sensitive receivers would qualify for mitigation.

Submissions

Public Submissions

Key noise issues raised in the public submissions included:

- construction and operational impacts on the rural amenity of the area;
- construction noise impacts on sensitive receivers;
- operational noise impacts on sensitive residential receivers from increased train movements, particularly at night;
- operational noise impacts on sensitive receivers near level crossings from the use of train horns, and the bells and whistles installed on the level crossings;
- impacts to local businesses from increased operational noise.

Council and Government Agency Submissions

Narromine Shire Council expressed concern that the increased track height would cause operational noise to travel farther than existing rail noise, and requested the Proponent consider noise attenuation. Narromine Shire Council also requested that construction hours reflect the proximity to nearby sensitive receivers and quiet background noise levels.

The **EPA** requested that the Proponent provide further justification for undertaking construction outside of standard construction hours. The EPA also indicated that the Proponent used the incorrect sleep disturbance and noise criteria in the noise assessment, and requested the noise assessment be updated in the Submissions Report to include the correct criteria.

The EPA recommended a suite of conditions, including for the Proponent to implement all noise mitigation measures to minimise noise impacts where noise exceeds the NMLs, and for construction of the CSSI to be restricted to standard construction hours.

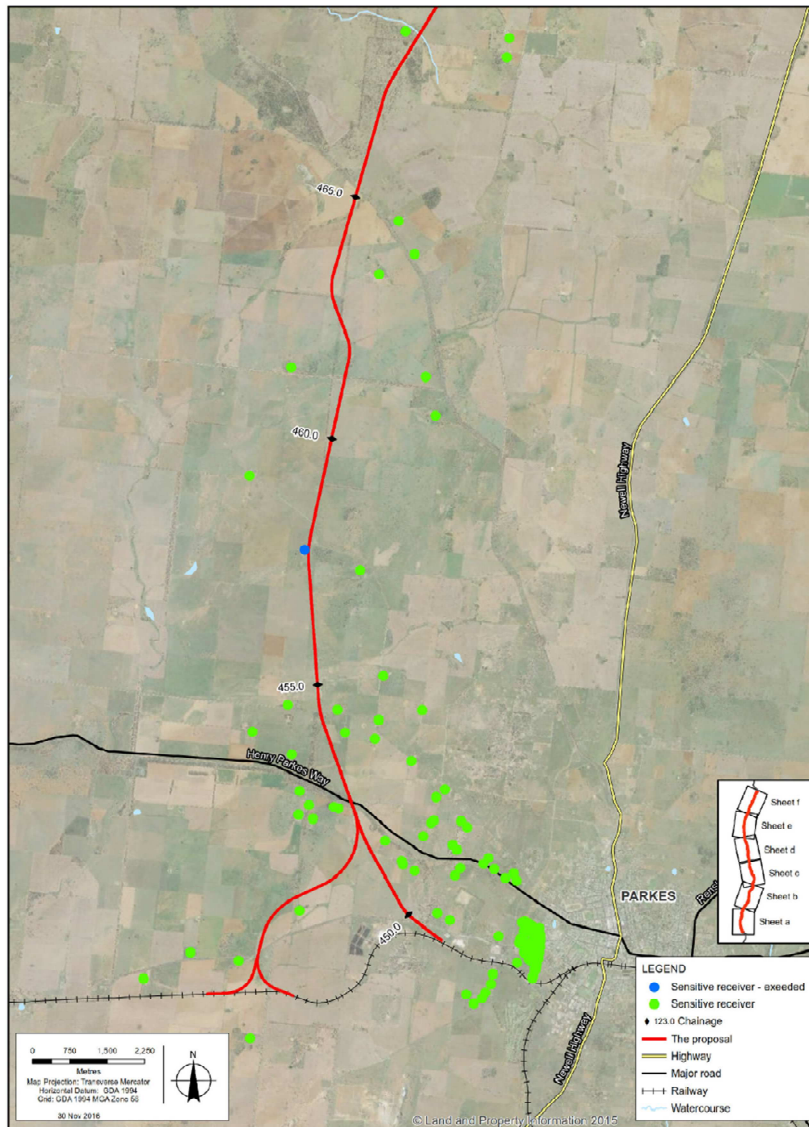


Figure 6: Sensitive Receiver Locations – Operational Noise Exceedences (Source: EIS)

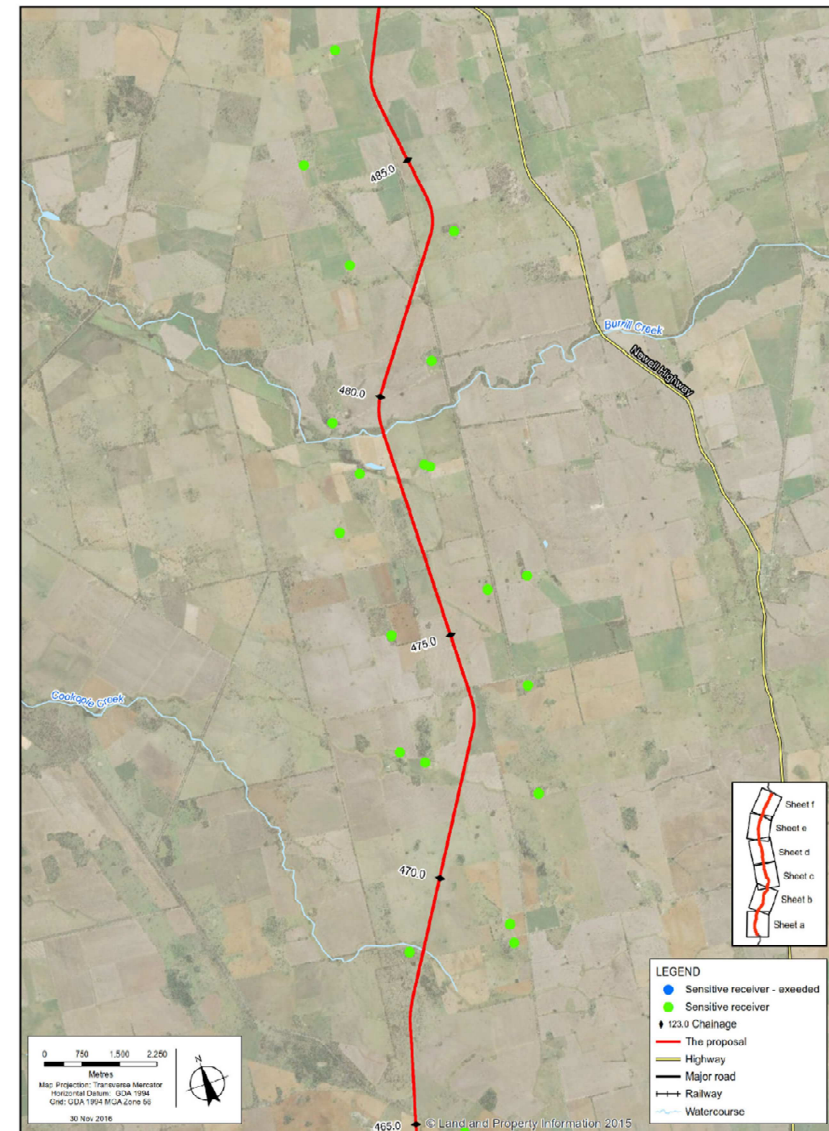


Figure 7 : Sensitive Receiver Locations – Operational Noise Exceedences (Source: EIS)

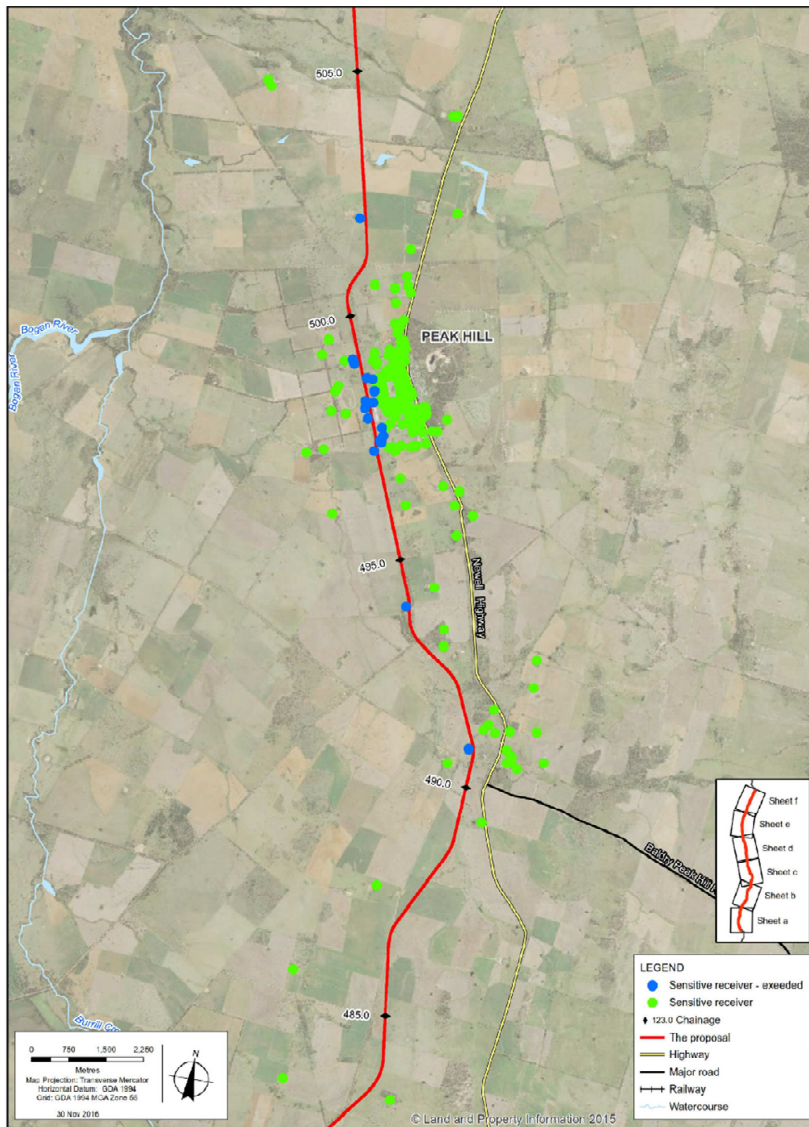


Figure 8: Sensitive Receiver Locations – Operational Noise Exceedences (Source: EIS)

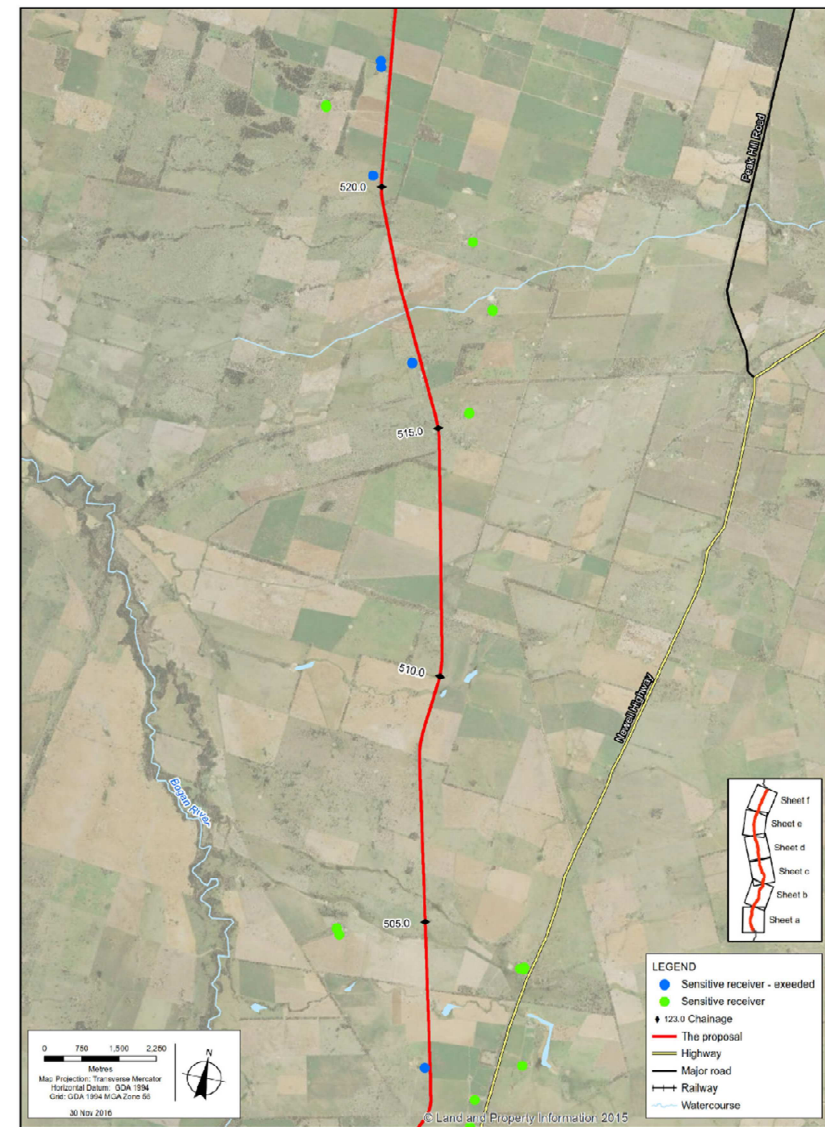


Figure 9: Sensitive Receiver Locations – Operational Noise Exceedences (Source: EIS)

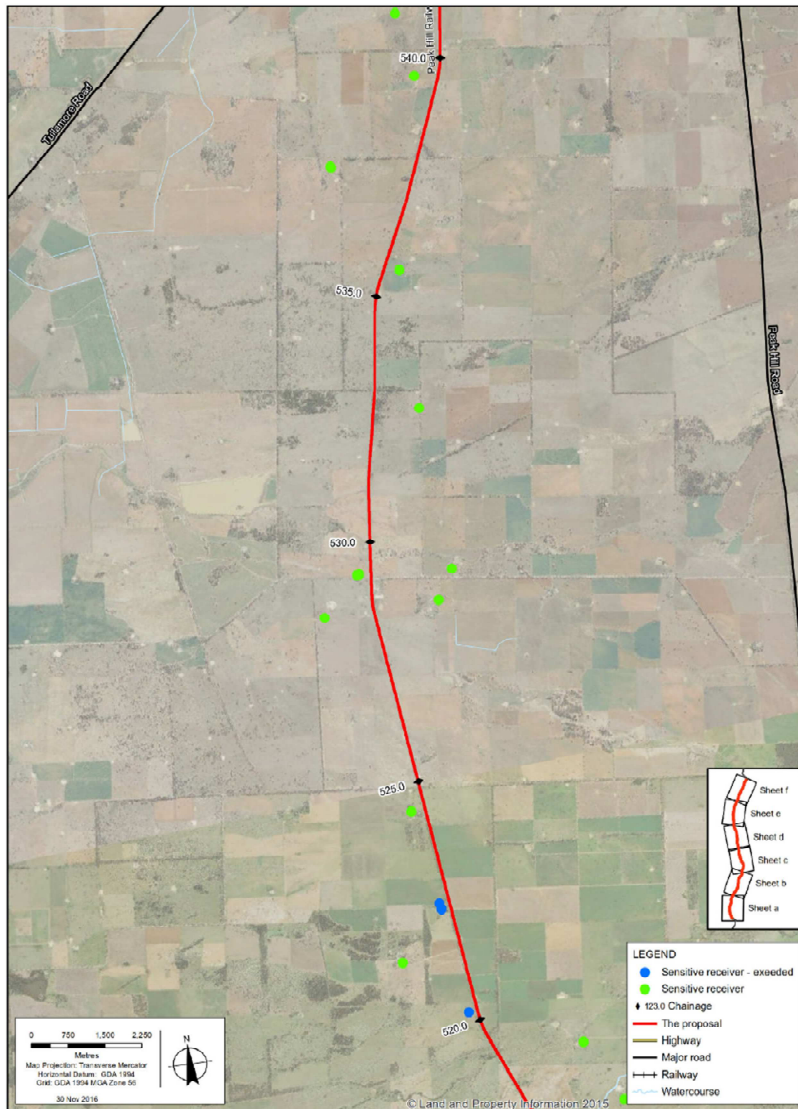


Figure 10: Sensitive Receiver Locations – Operational Noise Exceedences (Source: EIS)

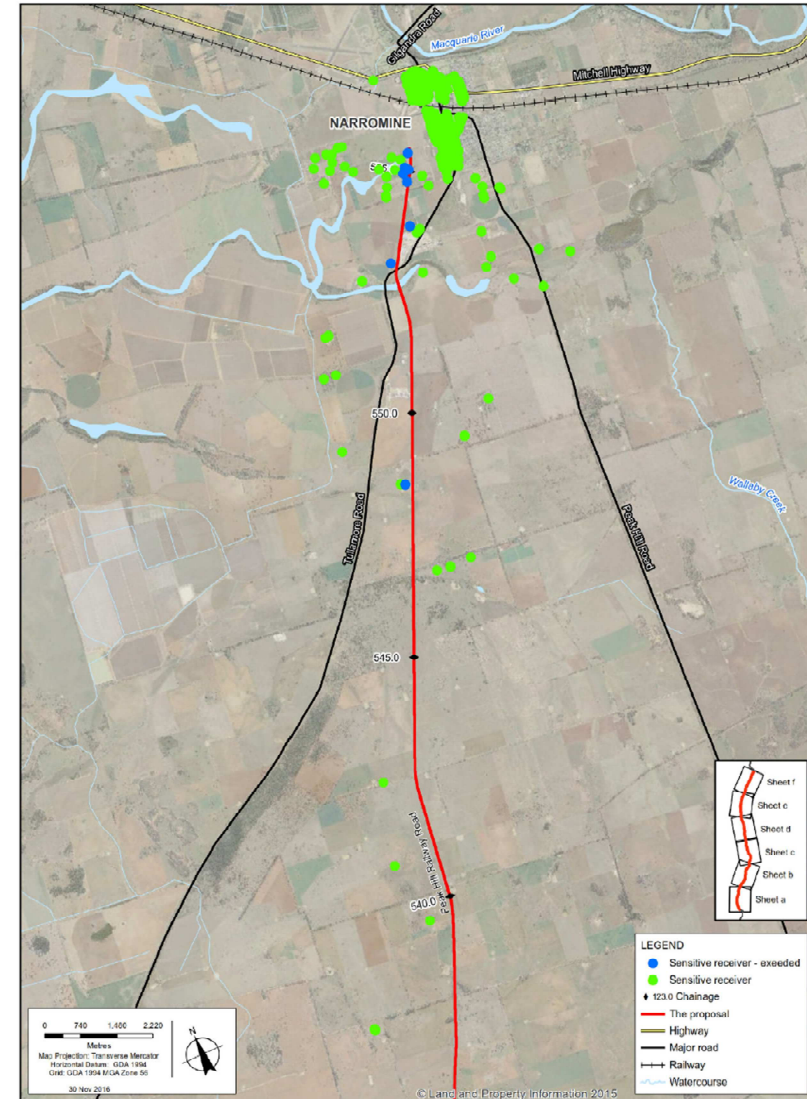


Figure 11: Sensitive Receiver Locations – Operational Noise Exceedences (Source: EIS)

Department's Consideration

Construction Noise

The Department recognises that multiple receivers will be impacted under various construction scenarios. Although some of the construction activities will have short-term impacts (days to weeks), other activities will have longer-term impacts (months). The Proponent has committed to managing construction noise through its *Inland Rail NSW Construction and Noise and Vibration Framework* (submitted as part of the EIS) which sets out standard noise mitigation measures. It has also proposed to prepare Construction Noise and Vibration Impact Statements for specific activities to manage and monitor construction and vibration impacts. Notwithstanding, the Department has recommended the preparation and implementation of a Construction Noise and Vibration Management Plan and Construction Noise and Vibration Monitoring Program, consistent with the requirements for other SSI rail proposals.

Although the EIS and Submissions Report proposed that construction would be undertaken from 6:00 am to 6:00 pm Monday to Sunday, the Proponent proposed that alternative construction hours would be undertaken under a range of circumstances, including:

- under hours permitted through an out-of-hours work protocol or an Environment Protection Licence (EPL);
- where agreement is reached between ARTC and potentially affected sensitive receivers;
- where works cannot be undertaken during the day due to high ambient daytime temperatures;
- 24 hours per day where five days' notice has been provided to noise sensitive receivers (for works on the existing rail corridor); and
- where works have been assessed as part of the Construction Noise and Vibration Impact Statement.

The Proponent has stated that it also intends for works to be carried out 24 hours a day during rail possessions. Rail possessions could extend for up to a three-month period.

The Department notes that the predicted residual noise impacts at sensitive receivers for the evening and night-time periods are considerable and the Proponent's intention to rely on notifications as a primary management measure (refer **Table 5**) is not consistent with high impact projects. Consequently, the Department does not support the Proponent's request for the proposed evening and night-time works where these would adversely impact on sensitive receivers.

Table 5: Management Measures for Noise and Vibration Exceedances (Source: EIS)

| Time period | | NML dB (A) | Perception | Exceedance of NML, dB(A) | Additional Mitigation Measures |
|-----------------------------|---------|------------|---------------------------------------|--------------------------|--------------------------------|
| All hours | | - | Highly affected, noise above 75 dB(A) | | Respite offer Communication |
| Proposal construction hours | 6am-6pm | 35 | Noticeable | <5 | - |
| | | | Clearly audible | 5-15 | Communication |
| | | | Moderately intrusive | 15-25 | Communication |
| | | | Highly intrusive | >25 | Respite Communication |
| Out-of-hours work | 6pm-6am | 35 | Noticeable | <5 | Communication |
| | | | Clearly audible | 5-15 | Communication |
| | | | Moderately intrusive | 15-25 | Respite Communication |
| | | | Highly intrusive | >25 | Respite Communication |

The Department acknowledges the need for some works outside of standard construction hours, especially during rail possessions where the Proponent has access to the rail corridor for restricted periods of time. However, due to the predicted high level of noise exceedances of a night time, it is considered that construction should not be permitted 24 hours a day under extended possession periods. Consequently, the Department has recommended that works may be undertaken during the hours of 6:00 am to 6:00 pm each day over a three-month period provided that there is no work between 1:00 pm on a Saturday and 7:00 am on a Monday every alternate week. This provides the Proponent with ability to undertake works effectively during extended rail possession periods, but also ensures that the community is provided with respite.

The Department has recommended that the Proponent prepare a Construction Noise Monitoring Program which would include details on noise monitoring to be undertaken outside of standard construction hours (i.e. 7:00 am to 6:00 pm Monday to Friday and 8:00 am to 1:00 pm on a Saturday). The recommended conditions also require the Proponent to establish a complaints management system which would include measures for responding to construction noise complaints.

The proposal will be subject to an EPL and therefore works outside of standard construction hours will be subject to review and approval by the EPA.

To facilitate a more pro-active approach to the management of noise impacts, particularly construction noise generated outside of standard hours, the Department has also recommended that operational noise mitigation measures be implemented during the early stages of construction to assist in addressing construction noise impacts.

The Department recognises the benefits of permitting low-noise impact construction activities to occur outside 6:00 am to 6:00 pm, if it expedites the progress of construction and reduces the overall period to which any one sensitive receiver is exposed to construction impacts. In addition, there are sections of the CSSI which are remote from sensitive receivers. As such, the Department has recommended conditions which allow for the Proponent to undertake works outside of standard construction hours where construction noise levels and impacts are relatively minor.

The Department also recognises that in some instances sensitive receivers are open to out-of-hours works if it reduces their overall duration of noise exposure. As such, the recommended conditions allow for negotiated agreements to be entered into with sensitive receivers which would specify agreed hours of work and noise levels.

The Department recognises that multiple receivers will be impacted under various construction scenarios. While the cumulative construction noise impact assessment indicates that a larger number of sensitive receivers would potentially be impacted when compared to the activity-specific assessment undertaken as part of the EIS, it is acknowledged that the actual potential for receivers to be impacted from concurrent activities is low.

Construction Traffic Noise

The increase in noise levels due to construction traffic was estimated to be less than one decibel which would not be perceptible at receivers. Accordingly, the Department has not recommended specific conditions in regards to construction traffic noise. However, it has recommended that construction traffic must not use local roads or privately-owned roads unless no alternate access is available, and that the Proponent must obtain the permission of the landowner to utilise existing private access tracks.

Construction Vibration

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 generally 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 be notified before construction that generates vibration commences in the vicinity of such properties.

Operational Noise

Noise from train movements

The issue of operational train noise was raised in most of the public submissions. The proposed increase in train movements will result in an increase in noise with a predicted 28 sensitive receivers experiencing noise levels in excess of the RING trigger levels. The Proponent has deferred the selection of mitigation and management measures for operational noise until detailed design has been completed. The Proponent committed to preparing an Operational Noise and Vibration Review (ONVR) to confirm noise and vibration control measures based on the final detailed design, with the ONVR to be completed within three months of through connection (2025).

The Department supports the Proponent's commitment to prepare an ONVR, but does not support the proposal for it to be submitted in 2025. Therefore, the Department has recommended a condition requiring the ONVR to be submitted within three months of construction commencing. The ONVR must describe the final suite of noise and vibration management measures that would be implemented to reduce operational noise impacts.

The Department has also recommended that the Proponent prepare an Operational Noise Compliance Report within 12 months of and at 10 years after the commencement of operation to verify the noise performance of the proposal and identify any additional measures that would be implemented in the event that noise levels exceed the operational noise criteria.

The only operational noise mitigation measure currently proposed by the Proponent is the installation of at-property architectural treatment. However, the Proponent has indicated that there is the potential for excess spoil to be used as noise mounds. This option would be investigated as part of the ONVR.

Noise from Train Horns and Warning Bells at Level Crossings

The Department acknowledges that there is a need to balance the community's concerns regarding horn noise and bell noises at level crossings and the safety requirements the Proponent must abide by when operating a rail line.

The Proponent's noise assessments conclude that horn and warning bell noises would not significantly increase the overall noise levels of the proposal (less than 3 db(A) increase). The Department considers that an appropriate method of mitigating against these noise sources, where the cumulative noise impact exceeds the operational noise criteria, is through at-property treatments or barrier treatments which would be implemented as part of the overall operational noise management strategy. Further, the Department is confident that the requirement to confirm operational noise levels as part of the ONVR would ensure that horn and warning bell noise are further considered and appropriate mitigation implemented, if required.

Operational Vibration

The Proponent's assessment indicates that the operation of the proposal is unlikely to exceed vibration criteria at the nearest sensitive receivers. The Department acknowledges that the potential for vibration to impact on structures and human comfort will be reviewed upon completion of detailed design and confirmed as part of the recommended ONVR.

Conclusion

The Department acknowledges that the construction of the proposal will have construction noise and vibration impacts at a large number of sensitive receivers. The Department has recommended conditions that require the Proponent to implement mitigation measures to reduce construction noise and vibration. It is considered that these measures, along with the requirements to provide periods of respite and implement operational noise mitigation measures during construction, would provide for construction noise and vibration impacts to be managed to an acceptable level. Further, out-of-hours works would be regulated through an EPL. The Department is satisfied that operational noise will be adequately managed through the implementation of the ONVR.

5.2. Biodiversity

Issue

The proposal is located within the NSW South Western Slopes and Darling Riverine Plains Bioregions and Lower Slopes and the Bogan Macquarie Subregions. The majority of the area to be utilised for the proposal is cleared or consists of non-native vegetation. However, patches of native vegetation are located within and nearby the alignment, and in some instances are connected to small woodland patches on adjacent agricultural land.

To assess the impacts of the proposal on ecological values, the Proponent undertook a biodiversity assessment which included flora and fauna surveys and database searches. The information collected from the surveys and database searches was used in conjunction with the concept design to determine the impacts on biodiversity and calculate the number of biodiversity credits to be retired. Consequent to concerns raised by OEH in its submission on the EIS, and by the Department, regarding the assessment methodology, the Proponent revised its vegetation mapping and updated the calculation of biodiversity credits to reflect the revised vegetation mapping and included temporary impacts to native vegetation (refer to the biodiversity addendum report in **Appendix D**).

Bilateral Agreement and Framework For Biodiversity Assessment

The Bilateral Agreement between the Commonwealth and NSW governments for the assessment of environmental approvals under the EPBC Act has endorsed the *NSW Biodiversity Offsets Policy for Major Projects* (OEH, 2014) and *Framework for Biodiversity Assessment* (FBA) (OEH, 2014) as providing a basis for undertaking biodiversity assessments. OEH has reviewed the Proponent's biodiversity assessment against the FBA and has determined that it meets the requirements of the FBA. A copy of OEH's assessment is attached as **Appendix E**.

The Proponent has addressed the Commonwealth requirements and assessed the impacts of the proposal on matters of national environmental significance in the Biodiversity Assessment Report prepared as part of the EIS and in the addendum to the Biodiversity Assessment Report (included as **Appendix D** in this report). Sections of the EIS relevant to Matters of National Environmental Significance include: Chapter 10 – Biodiversity; Chapter 26 – Cumulative and Residual Impacts; Appendix L – Inland Rail, Parkes to Narromine Biodiversity Offset Strategy (Phase 1); and Technical Report 2 – Biodiversity Assessment Report, Technical Report 3 – Aquatic Ecology Assessment; and Technical Report 4 – Commonwealth Matters Assessment. Sections of the Submissions Report relevant to Matters of National Environmental Significance include Table B-5 in Appendix B, Appendix D and Appendix I.

Terrestrial Flora

The proposal will require the clearing of approximately 923 hectares of vegetation, of which about 160 hectares is native vegetation. Construction of the proposal will require clearing vegetation identified as endangered ecological communities (EECs) listed under the NSW *Biodiversity Conservation Act 2016* and the EPBC Act.

Table 6 provides a summary of the impacts to vegetation located within the clearing impacts of the proposal. Approximately 27.35 ha of Koala habitat will also be cleared.

Table 6: Vegetation in the Proposal Area (Source: Biodiversity Addendum Report)

| Vegetation zones / plant community type (PCT) | Endangered ecological community equivalent | EEC (hectares) | Total impact (hectares) |
|--|---|----------------|-------------------------|
| PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion | Myall Woodland EEC under the BC Act* | 4.74 | 4.74 |
| | Weeping Myall Woodlands EEC under the EPBC Act | 1.69 | |
| PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | Not listed | n/a | 1.49 |
| PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | Not listed | n/a | 29.4 |
| PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt | Not listed | n/a | 1.95 |
| PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | Inland Grey Box Woodland EEC under the BC Act | 44.08 | 62.16 |
| | Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC under the EPBC Act | 61.47 | |
| PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) | Not listed | n/a | 23.46 |
| PCT201 (CW138, LA145) Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion | Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions EEC under the BC Act | 1.88 | 1.88 |
| PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | White Box Yellow Box Blakely's Red Gum Woodland EEC under the BC Act | 8.43 | 8.43 |
| | White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act | 6.26 | |
| PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | White Box Yellow Box Blakely's Red Gum Woodland EEC under the BC Act | 26.96 | 26.96 |
| | White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act | 26.96 | |
| Cleared/Non-native vegetation | Not listed | | 762.26 |
| Total | | | 922.74 |

Note: Total PCT impact Includes EEC and non-EEC

*BC Act – Biodiversity Conservation Act 2016

The DoEE found in its assessment of the referral documentation (EPBC 2016/7731) that there are likely to be significant impacts arising from the action on the following matters of national environmental significance:

- critically endangered White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community;
- endangered Grey Box (*Eucalyptus microcarpa*) Grassy woodlands and Derived Native Grasslands of South-eastern Australia;
- foraging habitat for the vulnerable Superb Parrot (*Polytelis swainsonii*); and
- foraging habitat for the critically endangered Regent Honeyeater (*Anthochaera phrygia*), and critically endangered Swift Parrot (*Lathamus discolor*).

In addition, DoEE advised that the endangered *Tylophora linearis* may be present. The updated biodiversity assessment indicates that approximately 35.39 hectares of potential habitat is present. However, field surveys did not record this species in the proposal area.

Threatened Species - Flora

Four threatened flora species were identified in the Secretary's Environmental Assessment Requirements as potentially being at risk from construction of the proposal - spear-grass (*Austrostipa wakoolica*), spiny peppergrass (*Lepidium aschersonii*), small purple-pea (*Swainsona recta*) and silky swainson-pea (*Swainsona sericea*). Field surveys confirmed these species are not present in the area to be used for the proposal. As the potential habitat is highly modified the assessment did not consider these matters further.

Terrestrial Fauna

A total of 66 fauna species were recorded during field surveys, including two threatened species - the Superb Parrot (*Polytelis swainsonii*, listed as vulnerable under the *Biodiversity Conservation Act* and EPBC Acts) and Grey-crowned Babbler (*Pomatostomus temporalis*, eastern sub-species, listed as vulnerable under the *Biodiversity Conservation Act*). Potential habitat exists for the EPBC Act listed species the Regent Honeyeater (*Anthochaera phrygia*), Painted Honeyeater (*Grantiella picta*), Koala (*Phascolarctos cinereus*), and the South-eastern Long-eared bat (*Nyctophilus corbeni*). However, these species were not recorded during the surveys. Although the Koala was not recorded, there have been four recordings of this species in the past in proximity to the route alignment indicating that the species may forage within the area as part of a broader home range.

As noted, the proposal is likely to significantly impact foraging habitat for the following EPBC Act listed species: Swift Parrot (21.22 hectares); Regent Honeyeater (21.22 hectares); and Superb Parrot (160.47 hectares). As breeding habitat for these species is not impacted, ecosystem credits have been generated as part of the offset requirements rather than species credits. **Table 7** provides a summary of the proposed offset credits on direct impacts.

Aquatic Flora and Fauna

The biodiversity assessment concluded that aquatic threatened species/populations are unlikely to occur in the area of the proposal as the watercourses along the existing rail corridor are first and second order ephemeral streams with intermittent flow following rain events, and little or poorly defined channels. The watercourses have been modified by crossing structures for rail, road and agricultural land practices, with minimal native vegetation retained along the banks of the watercourses.

Three fish species listed as threatened under the EPBC Act are predicted to occur within the locality - Trout cod (*Maccullochella macquariensis*), Murray cod (*Maccullochella peelii*) and Macquarie perch (*Macquaria australasica*). There are no records of threatened fish species within the watercourses crossed by the existing rail corridor between Parkes and Narromine or within the Parkes LGA. However, two threatened fish species have been recorded in the Narromine LGA - Murray cod (*Maccullochella peelii*) and Silver perch (*Bidyanus bidyanus*).

Table 7: Biobanking Offset Credit Requirements (Source: Biodiversity Addendum Report)

| Plant community type/species | EPBC Act listed items | Credits required |
|---|---|------------------|
| Ecosystem credits | | |
| PCT26 Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion | - Myall Woodland - Superb Parrot (foraging habitat) | 219 |
| PCT36 River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | - Superb Parrot (foraging habitat) | 54 |
| PCT55 Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | - Superb Parrot (foraging habitat) | 1409 |
| PCT70 White Cypress Pine woodland on sandy loams in central NSW wheatbelt | - <i>Tylophera linearis</i> (potential habitat) - Superb Parrot (foraging habitat) | 48 |
| PCT76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | - Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia - Superb Parrot (foraging habitat) - Regent Honeyeater (foraging habitat) - Swift Parrot (foraging habitat) | 1,793 |
| PCT244 Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) | - Superb Parrot (foraging habitat) | 773 |
| PCT201 Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion | - Superb Parrot (foraging habitat) | 88 |
| PCT267 White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | - White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland - <i>Tylophera linearis</i> (potential habitat) - Superb Parrot (foraging habitat) - Regent Honeyeater (foraging habitat) - Swift Parrot (foraging habitat) | 366 |
| PCT276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | - White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland - <i>Tylophera linearis</i> (potential habitat) - Superb Parrot (foraging habitat) - Regent Honeyeater (foraging habitat) - Swift Parrot (foraging habitat) | 1161 |
| Total ecosystem credits required for offsetting | | 5,911* |
| Species credits | | |
| Koala | | 711 |
| Total species credits required for offsetting | | 711 |

Note*: due to rounding the biodiversity credit reports total 5,913 ecosystem credits, however according to the BioBanking Credit Calculator the total number of ecosystem credits is 5,911.

There are records of the freshwater Catfish/eel tailed catfish (*Tandanus tandanus*) endangered population in the Murray/Darling Basin in the Macquarie River upstream and downstream of Narromine. The biodiversity assessment concluded that the areas to be impacted by construction of the proposal do not provide habitat for an important population of the Murray cod which is listed as vulnerable under the EPBC Act.

The proposal will have localised disturbances due to the replacement of existing watercourse crossing structures. As part of these works, approximately 3.2 hectares of riparian vegetation is predicted to be removed. The clearing of these areas has been assessed in accordance with the FBA.

Groundwater Dependent Ecosystems

The assessment identified two groundwater dependent ecosystems (GDEs) within the area to be affected by construction - River Red Gum Forest along Burrill Creek and the Belah Woodland associated with Tomingley Creek. The GDE *Artesian Springs Ecological Community in the Great Artesian Basin*, which is listed as critically endangered under the *Biodiversity Conservation Act* and endangered under the EPBC Act, is predicted to occur in the proposal area but was not identified during the vegetation surveys. As the proposal will not require groundwater extraction or significant changes to the surface water regime, the risk of impact on GDEs is predicted to be low.

Biosecurity Risks - Noxious weeds

The proposed rail corridor area and surrounding area is subject to noxious weed infestations which are 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 via construction vehicles or machinery, or construction crew clothing and footwear.

Submissions

Public Submissions

None of the community submissions raised biodiversity as an issue.

Council and Government Agency Submissions

Neither Parkes nor Narromine Shire Councils raised biodiversity as an issue.

OEH raised the following issues in its submission:

- temporary impacts on biodiversity values must be assessed in accordance with *Framework for Biodiversity Assessment* and offset as part of the Biodiversity Offset Strategy;
- impacts on biodiversity values (temporary and permanent) should be finalised prior to approval of the proposal;
- native vegetation mapping should be reviewed and updated;
- there is a need to justify the use of a three to one (3:1) crown separation ratio to identify woodland areas;
- there are inconsistencies in the total area of native vegetation being cleared throughout the EIS;
- further justification is required as to why PCT 55 and PCT 70 are not considered to be potential Koala habitat; and
- there is a need to confirm when the Biodiversity Offset Strategy will be finalised.

DPI indicated that its Guidelines for Controlled Activities on Waterfront Land should be implemented as part of the mitigation measures to address watercourse stability and to maintain riparian vegetation.

Department's consideration

Assessment Methodology

As noted above, OEH raised a number of issues in regards to the methodology and adequacy of the biodiversity assessment, which the Department concurred with, and consequently the Proponent was required to update the vegetation mapping based on available regional vegetation mapping data. In addition, all biodiversity impacts identified as temporary in the EIS were reclassified as permanent and biodiversity credits were recalculated based on the

revised impacts. The additional assessment work was submitted as an addendum report to the Department (**Appendix D**). OEH indicated that the additional assessment met the minimum survey effort requirements of the FBA.

Biodiversity Offsets

Ecosystem credits have been generated for all EPBC Act listed ecological communities and threatened species likely to be significantly impacted, whereas species credit have been generated for the Koala. As *Tylophora linearis* was considered to possibly be at risk of being impacted, ecosystem credits will be retired to offset impacts to the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC as these communities provide habitat for this species.

Based on the results of the updated assessment, the Proponent has determined that a total of 5,911 ecosystem credits and 711 species credits are required to offset the impacts of the proposal (refer **Table 7**).

The Proponent has committed to limiting clearing of native vegetation to the greatest extent practicable and this has been reinforced in the recommended conditions of approval. Consequently, it is possible that the amount of native vegetation cleared may differ to the predictions made. It is also plausible that the actual extent and type of vegetation to be cleared may differ slightly to that shown on the regional mapping due to changes in land use and vegetation since the date of mapping. The Department considers that the Proponent should be provided with the opportunity to review and update the ecosystem and species credit requirements to reflect the final impact zone and has recommended a condition to this effect and the process for review and update. This approach has been endorsed by OEH and DoEE.

The Proponent's Biodiversity Offset Strategy (Phase 1) identifies methods for offsetting all matters of national environmental significance on a 'like-for-like' basis, in accordance with the Bilateral Agreement. The Proponent has committed to finalising the Strategy within 12 months of the commencement of construction. The finalised Biodiversity Offset Strategy would set out details of the proposed offset sites, the ecosystem and species credits created at offset sites, and any supplementary measures. The Department has reinforced this commitment in the recommended conditions of approval and stipulated that the Strategy must be prepared in consultation with OEH, DoEE and in accordance with the FBA.

In accordance with the advice of OEH, the Department has recommended that the Proponent must retire all biodiversity credits within 12 months of the approval of the Biodiversity Offset Strategy. Three options have been provided for the retirement of credits:

- retiring credits under the *Biodiversity Conservation Act*;
- making payments into the Biodiversity Conservation Fund (upon approval of the Secretary);
- providing supplementary measures.

It is understood that the Proponent seeks to combine the offset requirements for the Parkes to Narromine proposal with the biodiversity requirements for other (Narrabri to North Star) and future Inland Rail proposals in NSW, which have not yet been determined. The Department considers this approach would allow adjoining biodiversity values to be captured and reduce the potential for offsets to be located in isolated patches. This approach is supported in principle, consequently the recommended Instrument of Approval does not prevent the Proponent from combining the offset requirements with other Inland Rail proposals and submitting an updated Biodiversity Offset Strategy for more than one proposal.

Groundwater Dependent Ecosystems

As the proposal is unlikely to impact on GDEs, the Department has not recommended any conditions in regards to these communities.

Aquatic Flora and Fauna

It is considered that the proposal's impacts to fish species is negligible as the proposal crosses first and second order ephemeral streams with intermittent flow following rain events, and little or poorly defined channels. The use of standard construction mitigation measures such as erosion and sediment control would be implemented to minimise the potential for adverse impacts.

The proposal will be required to offset approximately 3.2 hectares of riparian vegetation in accordance with the FBA. This would be addressed as part of the Biodiversity Offset Strategy.

Noxious Weeds

The Proponent will be required to manage weeds in accordance with the *Biosecurity Act 2015* during construction and operation. To ensure the risks of transmitting noxious weeds is minimised, the Department has recommended the preparation and implementation of a Weed Management Plan and hygiene protocol as part of the Construction Flora and Fauna Management Sub-plan.

Conclusion

The assessment of the biodiversity impacts of the proposal has been carried out in accordance with the FBA. The Department acknowledges the proposal will directly impact ecological communities and threatened species identified under the *Biodiversity Conservation Act* and EPBC Act. The impacts to all these communities will be offset in accordance with the FBA.

The Department considers the impacts on matters of national environmental significance have been adequately addressed by the Proponent. The Department also considers that the likely impacts to the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC*, *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC*, *Weeping Myall Woodlands EEC*, *Tylophora linearis* (potential habitat), Superb Parrot (foraging habitat), Regent Honeyeater (foraging habitat) and Swift Parrot (foraging habitat) would be effectively managed and offset through the recommended conditions. The Department recommends that the DoEE considers and adopts these recommendations which are set out in Part C (conditions C4 and C8) and Part E (conditions E14 to E20) of the recommended instrument of approval and reproduced in **Appendix F. Appendix G** of this report sets out the additional EPBC Act considerations, including the Commonwealth's international obligations, consideration of relevant approved conservation advices, threat abatement plans and recovery plans.

5.3. Hydrology and Flooding

Issue

The proposal is located in the Lachlan River and Macquarie-Bogan River basins, both of which drain to the broader Murray-Darling Basin via the Macquarie Marshes, Great Cumbung Swamp, and the Darling River. Surface watercourses in the study area are predominantly ephemeral, in moderate condition with evidence of channel erosion downstream of existing rail culverts. Flood events within the area impacted by the proposal can be divided into two categories – regional and local. Regional floods occur due to high flows in the Macquarie and Lachlan Rivers following widespread rainfall over the whole catchment, while localised floods occur due to rainfall over the local catchment draining to an individual bridge or culvert. Regional flooding typically results in closures of local roads and highways.

An objective of the proposal is to decrease overtopping of the rail formation during flood events, thus improving the reliability of the line. The Proponent's flood modelling indicates that the existing rail formation currently overtops along approximately 70 metres of the rail corridor in a two year ARI flood event (i.e. a flood with an average recurrence once every two years),

along three kilometres in 20 year ARI flood event, and some seven kilometres in a 100 year ARI flood event.

The Proponent's flooding design objective for the CSSI is for the rail formation (at the corner of the formation capping) and tracks to have a flood immunity up to the 100 year ARI flood event. To facilitate this, the Proponent proposes to raise the height of the rail formation level between 30 centimetres and 1.5 metres, upgrade the existing culverts and construct new culverts. New and replacement culverts would be located at terrain low points at or adjacent to existing structures to avoid the creation of new flow paths across the rail line.

Following the upgrade works, the length of formation overtopped during a 100 year ARI flood event is predicted to be reduced by 94 per cent to about 406 metres. The predicted overtopping locations under the future operational design scenario are shown in **Figure 12**.

The flood assessment indicates that the increased height of the rail formation and placement of spoil mounds will increase the area of upstream flooding for all flood events exceeding the 50 year ARI flood event as well as increase flood levels immediately upstream of the rail formation, hence impacting on properties adjacent to the rail corridor.

It is also anticipated that the period of inundation would increase by up to nine times in some localities upstream of the upgraded rail formation. However, flood levels in most areas downstream of the existing rail corridor are expected to reduce for all events up to the 100 year ARI flood event.

No buildings are predicted to be inundated for all events up to and including the 100 year ARI flood event once the proposal is constructed.

Approximately 355 metres of existing public roads immediately adjacent to the rail corridor are predicted to be currently impacted by flooding. The impacts occur where the roads cross the rail line (i.e. level crossings) and include Alecstown West Road, Bulgandramine Road, Bogan Road Peak Hill Railway Road, Tomingley Road, Tomingley West Road and Wyanga Road. Following construction of the proposal, no new roads would be inundated and the depth of overtopping is predicted to remain unchanged at most roads. The exception to this is Wyanga Road and Peak Hill Railway Road where overtopping is predicted to increase in both depth (an increase of 0.51 metres and 0.11 metres, respectively) and length (an increase of 141 metres and 30 metres, respectively) for the 100 year ARI flood event. **Figure 13** shows the locations and extent of the predicted locations where public roads would be overtopped for the proposal compared with the existing situation.

The construction of new (up to 60) and upgraded culverts has the potential to result in altered local flows and increased velocities downstream of culverts by up to one metre per second, resulting in an increased potential for erosion and scouring downstream of the culverts. Upstream flow velocities are not anticipated to change appreciably (less than 0.1 metres per second).

An independent hydrologist (Bewsher Consulting) was engaged to assist the Department in undertaking a technical review of the Proponent's flood assessment. The review report is provided at **Appendix H**.

Submissions

Public Submissions

None of the public submissions raised flooding as an issue.

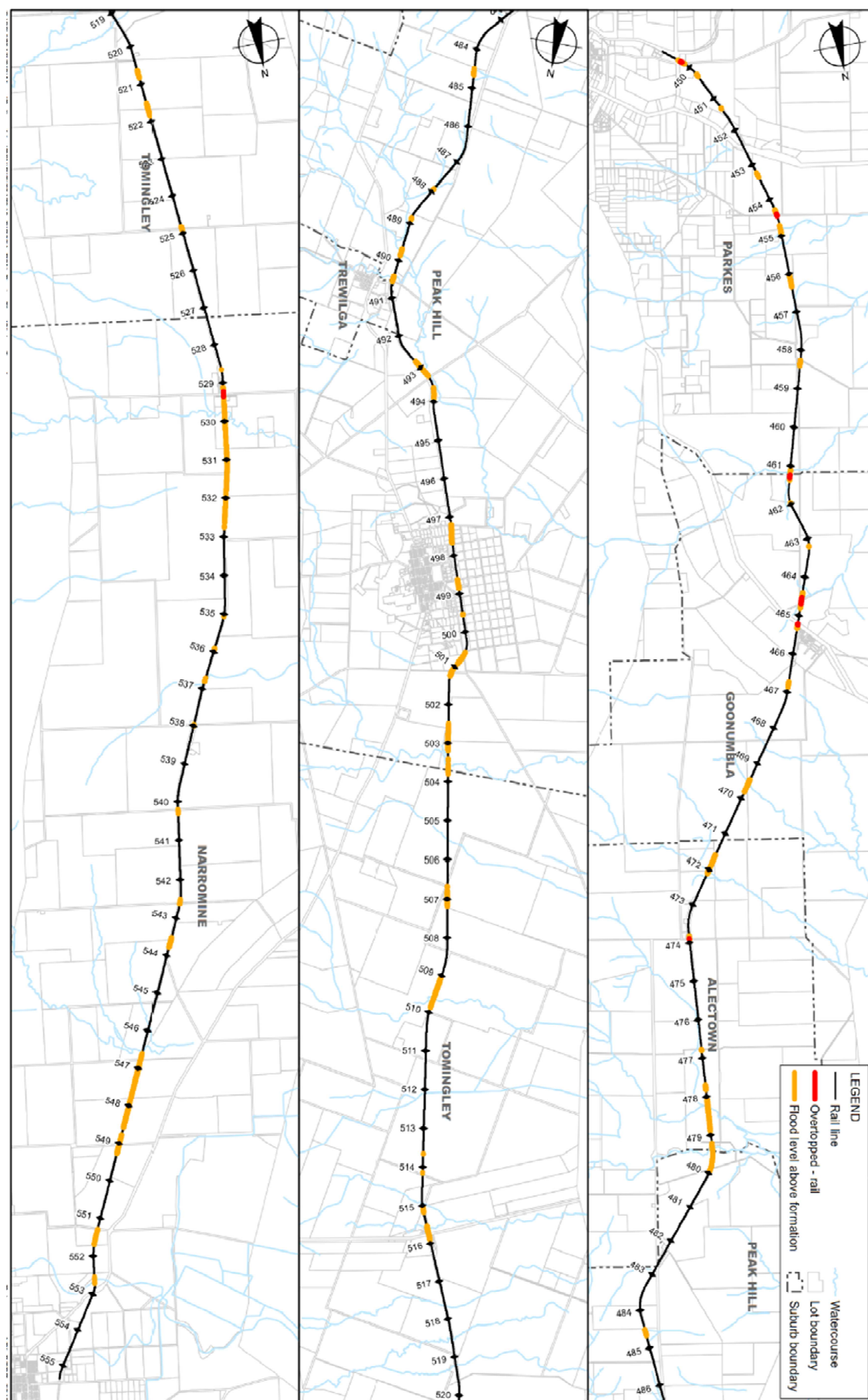


Figure 12: Rail Overtopping During Operation – Design Scenario (Source: EIS)

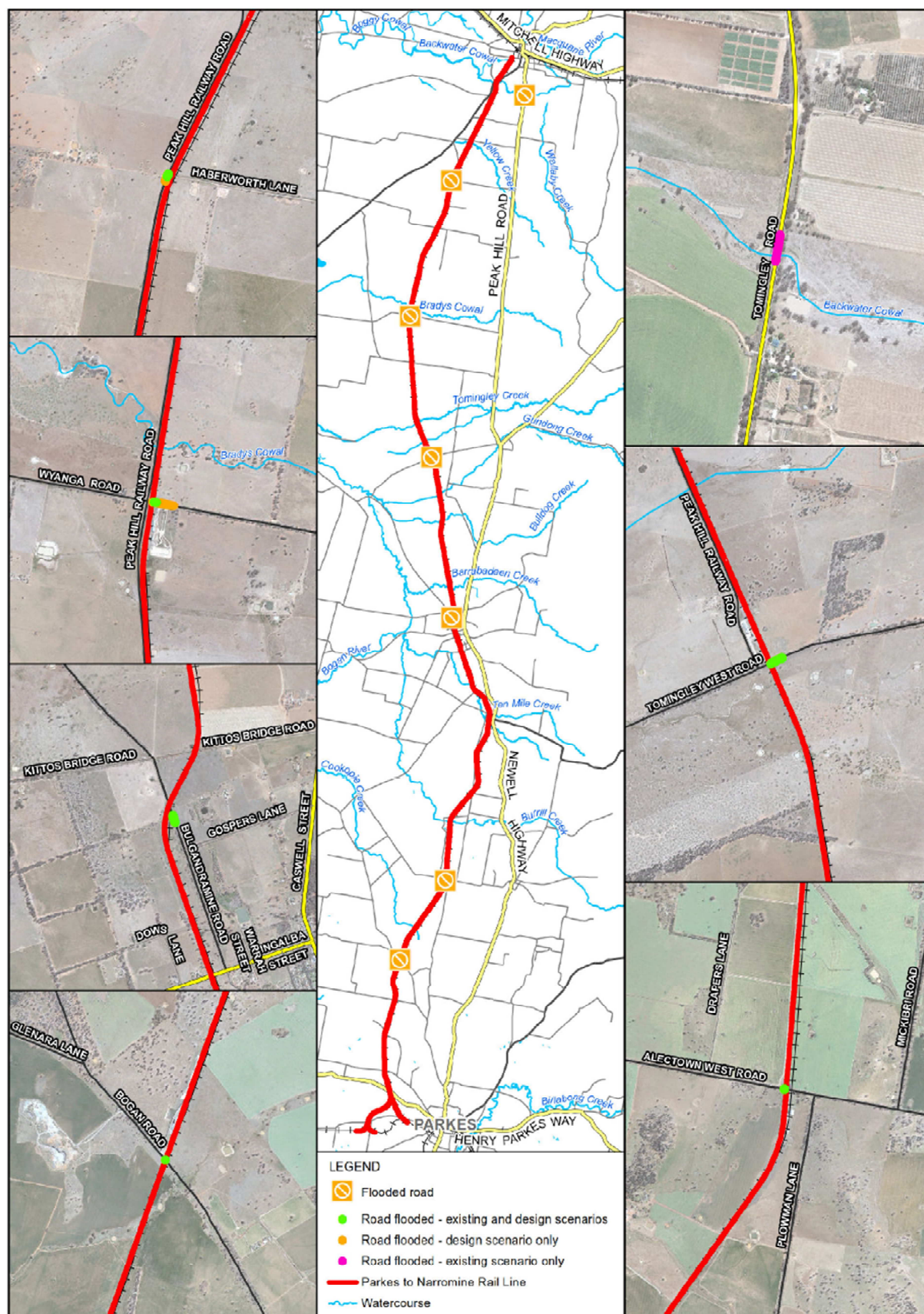


Figure 13: Public Roads Impacted by Flooding during a 100 Year ARI Flood Event - Existing and Design Scenarios (Source: EIS)

Council and Government Agency Submissions

Narromine Council raised concern over the potential for spoil mounds to have a damming effect on water flows and result in flow diversions. It also raised concern over the potential for the proposal to increase the maximum length and depth of inundation along local roads including Peak Hill Railway Road, Tomingley West Road and Wyanga Road. Further, Council highlighted the financial and productivity impacts of diverting floodwaters onto paddocks not previously flooded.

OEH raised concern that the flood assessment focussed on upstream impacts and recommended investigation of downstream tail water conditions. It also recommended investigation of the impact of the breakout of the Macquarie River during large events.

Consideration

As noted above, the flood modelling predicts a potential increase in flood levels, extent and duration upstream of the rail formation once the proposal is operational. The Proponent has committed to refining the design of the proposal with the aim of not worsening existing flooding characteristics, and to undertake flood modelling to support the detailed design. The Department supports the Proponent's commitment for further flood modelling following completion of the design. However, rather than have the design drive the flood outcomes, the Department considers that flooding outcomes should guide the design. This approach is supported by OEH and the Department's independent flood specialist.

Consequently, the Department has recommended maximum afflux levels for properties, floor levels and agricultural areas. In addition, maximum increases in inundation times for houses, commercial properties, agricultural areas and public infrastructure (e.g. sewage pumping stations) have been recommended. Further, the recommended conditions require spoil mounds to be located so that they do not affect the flood regime or impede the flow of water through culverts.

Narromine Council raised concern over the potential increase in length and level of floods over local roads. In response to this concern, the Department has recommended that the proposal be designed with the objective of achieving a maximum increase of 100 millimetres in flood height and 10 per cent maximum increase in inundation time over local roads.

The Department has also recommended that the results of the flood modelling be documented in a Flood Design Report which details the results of upstream and downstream flood modelling, compares the modelling results against the Department's recommended afflux and inundation parameters and, where it is found that the flooding characteristics exceed these parameters, describes the mitigation measures that would be implemented to meet the parameters. In the event that the flooding parameters are exceeded, the Proponent must achieve compliance through modified design of the proposal or at-property design measures such as raised access tracks or house raising.

Further, the Department has recommended that the Proponent compare the predicted flooding outcomes with the observed extent, level and duration of flood events once the proposal is operational. Where the observed impacts due to the proposal exceed the predicted impacts, with the consequent effect of adversely impacting on property, structures or infrastructure, the Proponent must identify and implement measures to reduce further impacts. The measures must be developed in consultation with OEH, the relevant councils, and affected property and infrastructure owners.

The Department notes that the EIS did not include modelling of downstream flooding impacts as the Proponent did not consider the flood extent would change as a result of the CSSI. Further, the Proponent's flood assessment indicates that there is expected to be a reduction in design flood levels for events up to the 100 year ARI flood event. To confirm this position,

the Department has recommended that downstream flood impacts be reviewed as part of the Flood Design Report. This will ensure that any potential for increased flood levels or extents will be identified and appropriate mitigation measures developed. This will also address OEH's recommendation to investigate downstream tail water conditions.

Watercourses downstream of existing culverts currently exhibit signs of erosion. This is inferred as being the result of progressive stream instability arising from increased watercourse flow velocities exiting existing culverts during flood events. At most locations, the length of watercourse instability does not exceed further than 50 metres. However, there are some localised areas where the effects extend further downstream of the individual structures. The Department has recommended that where areas outside of the rail corridor currently show scour or erosion and this is directly attributable to a rail culvert that is to be replaced as part of the proposal, the Proponent must implement measures to ensure stable downstream conditions and mitigate the potential for further scouring and erosion. To minimise the potential for scour and erosion downstream of replacement and new culverts during flood events, the Department has also recommended limits on flow velocities exiting the rail corridor.

The recommended conditions also require the Proponent to consult with landowners downstream of new culverts to determine the potential for introduced flows to affect the agricultural productivity of the land and, where adverse impacts are predicted, the management measures that would be implemented. This recommendation addresses Narromine Council's concern regarding the diversion of flood water onto paddocks not previously flooded.

Conclusion

The raising the height of the rail formation coupled with upgrading of existing culverts and construction of up to 60 additional culverts, has the potential to exacerbate upstream and downstream flood impacts. Based on recommendations from OEH and the Department's independent hydrologist, the Department has recommended maximum afflux levels and flood inundation times and placed limits on flow velocities exiting the rail corridor via culverts, to reduce the potential for adverse flood impacts to arise. The Department has also recommended conditions which require the Proponent to confirm the predicted flood impacts on completion of the detailed design, and once the proposal is operational based on actual flood events, with the outcome of identifying and implementing mitigation measures where flood impacts exceed the recommended flooding characteristics. While changes in the flood regime cannot be eliminated, the Department is satisfied that the recommended conditions of approval would assist in the management and mitigation of adverse flood effects on property and infrastructure resulting from the construction and operation of the proposal.

5.4. Construction Ancillary Facilities

Issue

The Proponent proposes to establish two types of construction ancillary facilities - minor compounds (e.g. for materials storage or assembly areas for culverts) and major compounds. Minor construction ancillary facilities would be located inside the rail corridor. Major construction ancillary facilities would be located approximately every 4.5 to five kilometres along the alignment outside of the rail corridor on leased private property. Uses on the major construction ancillary facilities would include stockpiling of materials, laydown areas for track infrastructure, bunded refuelling areas, offices, and storage of mobile plant/equipment and hazardous materials.

The Proponent has deferred finalising the location of construction ancillary facilities and access to the facilities to the detailed design stage.

Submissions

Public Submissions

The establishment and operation of construction ancillary facilities were not raised as issues in public submissions.

Council and Government Agency Submissions

The establishment and operation of construction ancillary facilities were not raised as issues in council submissions. **DPI** requested for compound locations to comply with DPI's suite of guidelines for controlled activities on waterfront land.

Consideration

In regards to minor construction ancillary facilities, these would be located within the rail corridor (which is cleared) and access would be from within the rail corridor or local streets / roads. Taking this into consideration, the small scale of the sites, and the types of activities that would be undertaken at minor compounds, it is considered that they could be established and operated with minimal environmental impact. Consequently, the Department has recommended requirements relating to the location of such facilities including no impacts on biodiversity, soil and water, flooding and heritage beyond those approved under the terms of the recommended Instrument of Approval.

A number of indicative locations were proposed in the EIS for major construction ancillary facilities along with locational criteria that would be applied when finalising the number and location of the compounds. The Department considers that prescribing criteria governing the location and establishment of construction compounds is an effective means of minimising the potential for adverse environmental impacts to occur as it places limits on the activities that would be undertaken. However, the Department considers that the criteria prescribed by the Proponent need to be broadened to include a number of other factors such as access, land owner agreement and heritage impacts and consequently has recommended additional locational criteria. In addition, the Department has recommended screening around all construction ancillary facilities that are within 500 metres of sensitive land uses.

Where major construction ancillary facilities cannot meet the locational/establishment criteria and/or are proposed at sites different to those illustrated in the EIS, the Proponent would need to obtain the Secretary's approval for their establishment and operation.

In accordance with DPI's request, the Department has also recommended a condition requiring all works on waterfront land to be undertaken in accordance with DPI's guidelines for controlled activities on waterfront land.

No details are provided on what specific strategies would be employed to manage and mitigate impacts arising during the establishment of the major construction ancillary facilities. Instead, the Proponent's assessment relies on the general environmental management measures stipulated for construction noise, traffic, access, biodiversity, visual amenity, flooding, heritage, air quality and water quality to be implemented. The Department considers that site specific management measures should be documented and implemented and has accordingly recommended a condition of approval requiring the Proponent to prepare a Site Establishment Management Plan which describes the activities to be undertaken during site establishment, how risks associated with the establishment of the site would be managed and a program for monitoring established performance outcomes.

The EIS only provided broad details on the typical activities that would be undertaken at the major construction ancillary facilities. It is important that more detailed information is provided on the range of activities that would be undertaken at each site and the proposed measures that would be implemented to manage any associated impacts (e.g. noise and traffic). Consequently, the Department has recommended that the Construction Environmental

Management Plan (CEMP) describe the activities at each site and that operation of such facilities cannot commence until the CEMP and relevant Construction Monitoring Programs have been approved.

The Department also acknowledges some landowners may experience access impacts from construction ancillary facilities located on their properties. The Department notes the Proponent's intent to lease land from landowners for the purpose of construction ancillary facilities, which would include terms and conditions related to their location and access. The need for landowner agreement has been reinforced in the recommended conditions of approval, noting that landowners are free to refuse access to their land.

The Proponent has advised that it may also need to access major construction ancillary facilities via private access tracks or land holdings. The Department has recommended a condition of approval requiring the Proponent to access construction ancillary facilities via existing public roads where possible. Where this is not possible, the Proponent may utilise private access where agreed to by the landowner. Where new access tracks are proposed, these must not impact on vegetation or heritage items beyond the impacts identified, assessed and approved under terms of the approval, and must provide all-weather access.

Conclusion

The Department acknowledges that the establishment and operation of construction ancillary facilities has the potential to impact on public amenity and access as well as biodiversity, water quality and heritage. However, it is considered that the recommended locational criteria and requirement to prepare a site establishment management plan would ensure that the sites are located and managed in a manner which would reduce the potential for off and on-site impacts to an acceptable level.

5.5. Spoil Management

Issue

An estimated 647,807 cubic metres of excess material mainly from the excavation of track formation and cess drains is proposed to be stockpiled within the existing rail corridor and then shaped and stabilised into spoil mounds. An indicative cross section is shown in **Figure 14**. The details and specific locations of the spoil mounds would be addressed in the detailed design phase. The Proponent has suggested that the spoil mounds would be a maximum of two metres high (one metre above the rails), be located on one or both sides of the tracks with gaps to allow drainage, and be designed in a way that doesn't impede overland flow paths. The mounds would be stabilised as required.

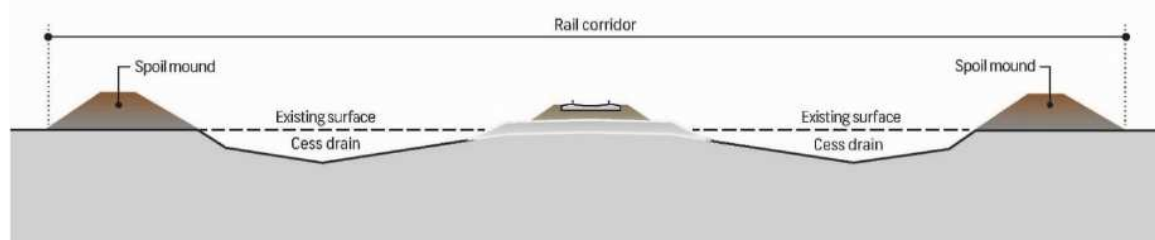


Figure 14: Indicative Spoil Mound Cross Section (Source: EIS)

Submissions

Public Submissions

The management of spoil and its emplacement into mounds was not raised as an issue in public submissions.

Council and Government Agency Submissions

The placement of spoil mounds was raised as an issue by **Narromine Shire Council**. Council expressed concerns that the spoil mounds could have a damming effect on the upstream catchment, which may increase flooding and impact cropping areas and subsequent farming incomes.

Consideration

The Department acknowledges that there remains a degree of uncertainty regarding the spoil mounds, including their size, location, visual impact and potential effects on overland flow paths and flooding.

The Proponent has committed to siting spoil mounds where they would not affect flow paths, including flood waters, and has argued that the increased height of the rail formation would pose a greater levee effect than the spoil mounds would. However, the Department agrees with Narromine Shire Council's concern that the spoil mounds could have a damming effect greater than the rail formation as they are proposed to be one metre higher. The Department has therefore recommended that the top of the spoil mounds must not exceed the top height of the upgraded rail line. It has also recommended that the location of the mounds must not impact on the flooding regime and that flood modelling must take into account the dimensions and location of the spoil mounds.

The Department has also recommended strict establishment criteria which not only govern where the spoil mounds can be located (including restricting emplacement to within the rail corridor and at least 50 metres distant from any watercourses and culverts), but also require the Proponent to ensure that placement of the mounds will not result in biodiversity and heritage impacts beyond those assessed.

Conclusion

The Department accepts that the design of the proposal has minimised the footprint for spoil mounds to impact on the environment by proposing to establish the mounds within the rail corridor. Notwithstanding, there is a need to ensure that the mounds would not exacerbate flooding impacts or create visual impacts and the Department considers that the recommended conditions of approval would reduce such impacts to an acceptable level.

5.6. Property and Land Use

Issue

The proposal is located in an areas which comprises a range of land uses including grazing, cropping (wheat and cotton), transport (road and rail infrastructure), urban centres and villages (Parkes, Peak Hill and Narromine), rural residential and industrial.

The key property and land use issues associated with the construction and operation of the proposal are property acquisition, impact on land values, and the consolidation of informal level crossings on private land. The use of private land for construction ancillary facilities is addressed in **Section 5.4**.

Land Acquisition

Ten privately owned lots are proposed for partial acquisition to construct the Parkes North-West Connection, of which approximately 50 per cent is zoned RU 1 (primary production) and the remainder is zoned for special activities/infrastructure (SP1 and SP2). Land acquisition requirements would be confirmed during detailed design. The Proponent expects the loss of agricultural land for the purposes of constructing the Parkes North-West Connection will have a negligible effect on the overall value of agriculture within the region.

Private Level Crossings

The existing rail line between Parkes and Narromine is crossed by 38 private level crossings. The Proponent proposes for 19 of the crossings to be retained, 17 to be considered for consolidation, and for two to be upgraded to gated crossings. Private level crossings are highly advantageous for properties which straddle the rail corridor in allowing livestock, machinery and equipment to be efficiently moved within and between properties.

The proposal will result in the number of freight train movements increasing from four per day currently, to an average 8.5 per day by 2025 and 15 per day by 2040. The increased number of train movements, coupled with increased train length and speeds and closure of some level crossings has the potential to impact on stock movements within properties that straddle the rail line.

Submissions

Public Submissions

Issues raised in public submissions included:

- impact of increased train movements and speeds on moving livestock within properties which straddle the rail line;
- increased wait times at crossings leading into properties; and
- impacts to property values.

Council and Government Agency Submissions

Property and land use issues were not raised in the submissions from government agencies and councils.

Consideration

Property Acquisition

With the exception of the Parkes North-West Connection, the majority of the proposal would be undertaken within the existing Parkes to Narromine line rail corridor minimising the degree of land acquisitions. Approximately 10 private properties would be partially acquired and are currently used for open grazing land, cropping, and farm buildings. The process to acquire the necessary properties is ongoing and the Proponent has committed to refining and confirming acquisition requirements during detailed design in consultation with property owners.

The Department accepts that land acquisition is an unavoidable outcome of linear transport projects, and acknowledges that for this proposal acquisition is limited to land required for the construction of the Parkes North-West Connection. Regardless, it is acknowledged that anxiety, stress and other effects on social wellbeing may arise during the acquisition process.

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*. In addition, the Proponent has indicated that where it is considered an “intolerable impact” would occur at a property due to partial acquisition, then consideration would be given to acquiring the entire property. The Department is satisfied with these measures.

Consolidation and Closure of Private Level Crossings

There are two types of private level crossing – formal level crossings constructed by ARTC under private arrangements with landowners and informal, make-shift level crossings where the rail tracks are at ground level. Although makeshift level crossings provide landowners with the convenience of moving stock and machinery, the Proponent has indicated that such crossings will not be retained as part of the proposal as they are not constructed in accordance with standards which aim to minimise the risk of incidents at rail crossings. The Department accepts the closure of informal crossings as they pose a safety hazard, noting that the degree of safety risk would increase once the proposal is operational due to the increase in the number of train movements and speeds.

In regard to formal private crossings, the Proponent has advised that closures would be restricted to crossings that are either not frequently used or where suitable alternative access exists. The Department recognises that there is a level of uncertainty regarding level crossing consolidations and that details on which level crossings would be removed or relocated still needs to be confirmed. This issue was raised in submissions from several community members who were concerned that the loss of level crossings would bisect properties and affect farming operations.

The Proponent has prepared a level crossing strategy which would involve a review of all private (and public) level crossings to determine works required to meet current crossing standards and Inland Rail operational criteria. Stage 1 of the strategy would identify options for level crossings and Stage 2 would involve consultation with stakeholders (landowners and road owners) on the preferred approach to level crossings.

The Proponent has indicated that consultation will be undertaken with potentially affected landowners during the detailed design stage, and that closures would only be undertaken if an alternative means of access exists and agreement with the land owner has been obtained. The Department notes that large properties often have multiple entries to accommodate dry and wet weather access, inter-property access, and the residents' preferences for which directions they wish to travel to, and the loss of a level crossing may cause the loss of multiple property access points.

To ensure the Proponent's commitments are effectively undertaken, the Department has recommended the Proponent prepare a Private Level Crossing Treatment Report. This report will need to document the outcomes of this consultation effort, including maps and descriptions of any proposed closures and upgrades and justification for these. The Department considers this condition will facilitate greater community certainty around the process of consolidating level crossings, and more confidence in their negotiations with the Proponent. Further, the Department has recommended that all upgrades must be in accordance with the relevant Australian standard for railway crossings.

Property Values

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

Conclusion

The proposal is likely to result in changes for the local community that would potentially result in logistical and economic impacts because of level crossing consolidation works, and property acquisitions. Although the impacts cannot be offset entirely, the Department considers the recommended conditions of approval, in conjunction with the Proponent's proposed management measures, would reduce the level of impact.

5.7. Traffic and Access

Issue

The road network in the study area comprises national, State and local roads and private property access roads. The major roads are the Newell Highway (part of the National Highway) and Henry Parkes Way (a State road between Orange and Condobolin). The Newell Highway runs generally north – south between Tocomwal near the Victorian border to Goondiwindi near the Queensland border. The Newell Highway is located to the east of the rail line between Parkes and Tomingley.

Roads that cross the rail corridor are shown in **Figure 15** and **Figure 16**. The alignment is also crossed by private roads and driveways which provide access to or within properties.

Construction Traffic

Construction would generate additional light and heavy vehicle movements on roads linking to the Newell Highway and Henry Parkes Way, and on these National and State roads. Light vehicles will generally move construction workers to and from specific construction areas and heavy vehicles will generally be delivering material such as fill, ballast, sleepers and culverts, and removing spoil from construction sites.

The Proponent identified potential construction access routes to the rail corridor. Access to the southern areas would generally be from Parkes with access to the northern areas from Narromine or Dubbo. Some locations will have two access points and some will have alternative routes available.

Daily construction traffic generation is estimated to total 400 vehicle movements (230 heavy/170 light) with indicative peak hour generation of 114 vehicles (39 heavy/75 light). The assessment considered the greater road network would not be significantly impacted by construction traffic and construction activities. The roads have sufficient capacity to accommodate the increased construction traffic and delays or closures at level crossings will only have localised affects due to the low volume of traffic on affected roads.

Operational Traffic

The operation of the proposal is expected to generate maintenance and operational traffic movements, however, the volume of additional traffic is expected to be minimal and unlikely to cause an adverse impact on the road network. The Proponent considers the key operational traffic impact to be travel time as a result of increased train activity at level crossings.

The traffic assessment expects an improvement in the waiting time at level crossings, with the maximum delay reducing from 122 seconds per train under existing rail track conditions to 109 seconds per train in year 2040, when train speeds increase from 90 kilometres per hour to 110 kilometres per hour. The frequency of train passbys will be increased over time. The Proponent estimates an average of 8.5 trains per day would use the Parkes to Narromine section when Inland Rail opens in 2025, increasing to 15 trains per day by 2040, which is in addition to existing rail traffic of four trains per day (average).

The increase in the frequency of rail traffic is expected to affect a small volume of vehicles and have localised impacts. The potential for queued vehicles to impact on adjacent intersections is considered to be low and on busier roads crossed by the proposal, such as Henry Parkes Way, there is sufficient room for traffic to queue without obstructing major intersections.

Public Level Crossings

The existing rail line is crossed by 33 public level crossings of which five are active crossings controlled by lights and bells, and the remainder are passive crossings controlled by stop signage and line marking. Of the 33 public crossings, it is proposed that 20 will be retained, 11 would be upgraded to boom barriers and two are considered for consolidation. The number of crossing consolidations would be confirmed during detailed design following consultation with Roads and Maritime Services (RMS) (for State roads) and local council (for local roads).

Property access during construction and operation

Construction of the proposal will result in individual and shared driveways, and State and local roads being blocked temporarily while the rail line is constructed and then again when associated level crossing treatments are installed. This will temporarily limit residents and community access until work progresses further along the alignment.



Figure 15: Road Network - Parkes to Peak Hill (Source: EIS)

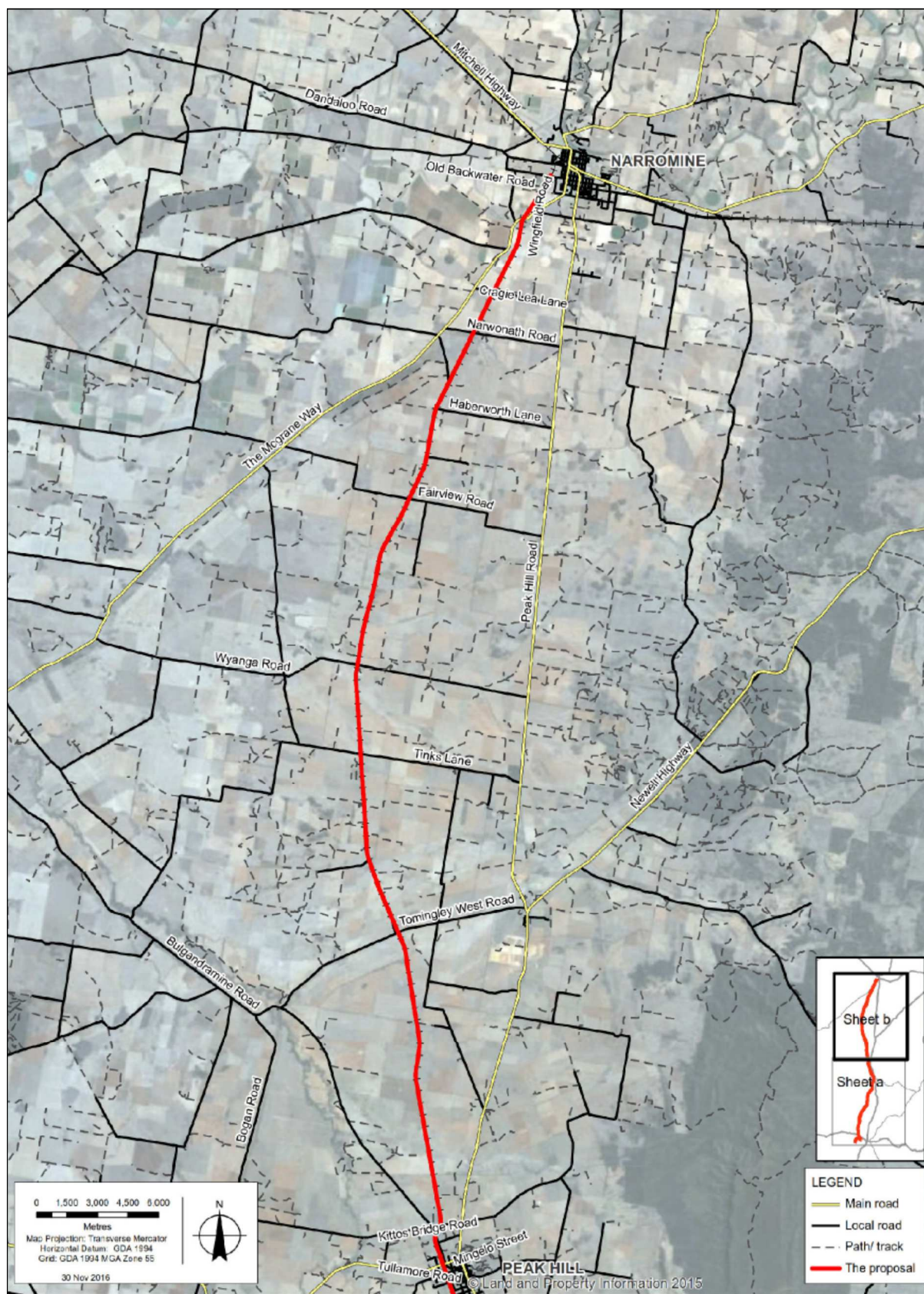


Figure 16: Road Network - Peak Hill to Narromine (Source: EIS)

In addition, there will be some inconvenience to landowners with regards to more frequent train movements, potentially causing more frequent delays at level crossings. Further, the location of passing loops over driveways has the potential to block access to private land holdings.

Parkes North-West Connection

The proposal includes a new five-kilometre section of rail line near Parkes to provide a new north to west connection between Inland Rail and the Broken Hill line. The Parkes North-West Connection will require permanent changes to several local roads (Brolgan Road, Coopers Road and Millers Lookout Road). Initially, it was proposed to build an overbridge over Brolgan Road and close part of Coopers Road. However, following exhibition of the EIS, the Proponent has progressed the design and the preferred option for the Parkes North-West connection is to change the Brolgan Road overbridge to a level crossing and keep Coopers Road open to traffic via a level crossing.

Submissions

Public Submissions

Key issues raised in the public submissions included:

- safety of farm workers and stock using existing level crossings to access property on both sides of the rail line;
- accuracy of mapping – one level crossing is shown in the wrong location and another is not shown;
- safety of traffic using the level crossings as a result of higher speeds and larger number of trains, and increased waiting time due to longer lengths of trains;
- safety of school bus stops close to the track; and
- the impact of crossing consolidations on landowners' accessibility within a property which straddles the rail, affecting access and the management of livestock and/or cropping.

Council and Government Agency Submissions

Parkes Shire Council noted the detailed design was not available and that it is critical to consideration of impacts of the proposal on roads within Parkes Shire. Other issues raised included timeframes for stakeholder consultation on level crossing consolidation, identification of haul routes and consideration of traffic generation and road assets, and construction impacts on level crossings. Council noted Coopers Road is expected to become busier in the future as the Parkes National Logistics Hub develops, and that it supports investigation into safe crossing treatments to enable the road to remain open.

Narromine Shire Council raised issues relating to pedestrian movements close to rail lines and property access, and suggested targeted consultation with bus drivers, emergency services and postal contractors. It noted that roads are also busy during summer crop harvesting (April to June) and should be unimpeded during this period. Council also recommended that more recent crash data should be used to provide a better picture of increased traffic and points of conflict. It also indicated that information on local roads to be used by construction traffic between Peak Hill and Narromine should be provided.

TfNSW raised concerns about the traffic and transport assessment, in particular, the efficiency and safety of increased train movements at key level crossings. TfNSW considered measures such as grade separation or quadrant gated crossings, should be examined to address increased risks at level crossing accidents. Operational matters such as sight distances for State (Henry Parkes Way) and regional road (The McGrane Way (Tullamore to Narromine Road)) crossings should also be assessed. TfNSW recommended the involvement of RMS in the development of the Construction Traffic, Transport and Access Management Sub-plan.

Department's Consideration

Construction Traffic Impacts

The construction of the proposal would result in a temporary increase in light and heavy vehicles movements on the local road network. The extent of impacts would depend on the location of the works and the origin of material and workers. The proposal is expected to generate around 400 construction vehicle movements per day, including 230 heavy vehicle movements. The peak hour construction traffic generation is expected to occur at the beginning and end of each shift with up to 114 vehicle movements (including 39 heavy vehicles) generated.

The Newell Highway is the busiest road in the study area to be used by construction vehicles. With the additional construction vehicles from the proposal, the total Newell Highway peak hour traffic volume would be around 360 vehicles per hour. Although this is a 38 per cent increase in traffic movement, the peak hour traffic volume is within the threshold for a road with a level of service B (average delays less than 15 seconds). The traffic assessment in the EIS assessed the Newell Highway's maximum one-way vehicle volume for a level of service B as 500 vehicles. The Proponent considers the additional construction vehicle movements will not affect the Newell Highway's existing level of service. Similarly, the local road network is not expected to be significantly impacted by construction vehicles, because the roads have sufficient capacity to accommodate the increased traffic.

The construction of the proposal is likely to occur in five-kilometre sections with an expected construction time of eight to 10 weeks. Therefore, construction vehicle usage of local roads will generally peak for the section under construction, not for the full duration of construction of the proposal. The Department considers that the additional construction traffic will not adversely affect the level of service of the road network during the peak harvesting periods.

Construction works at level crossings will result in temporary disruptions to traffic movements, however, such delays would not adversely affect the movement of traffic on the road network. The Department considers these impacts can be managed through the implementation of management and mitigation measures. As such, the Department has recommended the Proponent develop a Construction Traffic, Transport and Access Management Sub-plan as part of the CEMP for the proposal to manage the construction traffic and transport impacts of the proposal on the road network. The sub-plan is to be developed in consultation with the RMS and local councils.

The replacement of the previously proposed Brolgan Road overbridge with a level crossing and construction of a level crossing on Coopers Road is expected to result in greater impacts to road users during construction, such as temporary road closures, active traffic control management and detours. However, it is expected that construction vehicle movements overall would be reduced, particularly material haulage associated with the construction of an overbridge.

The safety of school bus stops was raised by Narromine Shire Council and in a public submission. The traffic assessment noted school bus services in Parkes, Peak Hill and Narromine, and local roads in the study area. The Proponent stated measures to minimise impacts to school buses would be addressed in a Construction Traffic Management Plan. To minimise impacts on school bus services, the Department has recommended a condition to require bus stops that are required to be closed or relocated, are relocated within walking distance of the original bus stop and that consultation on relocation/closure is carried out with the relevant council and bus operator.

Property Access During Construction

The Proponent has committed to maintaining property access with suitable alternative access arrangements provided where required, and for property owner/occupiers to be consulted in

advance regarding alternative access arrangements. The Department has reinforced these commitments in the recommended conditions of approval.

Where a property has multiple access points but has its primary access point blocked by the proposal's construction, the Proponent is under no obligation to provide an alternative access to the same road. Instead, the residents could be required to utilise minor or secondary access points, even if this results in a significant detour and increases in travel time, or the secondary access point is not fit-for-use during wet weather. Consequently, the Department has recommended a condition requiring the Proponent to maintain pedestrian and vehicular access and, where this is not possible, for alternative access to be developed in consultation with affected landowners.

Public Level Crossings

The proposal proposes to retain, upgrade or consolidate public level crossings. As noted in **Section 5.6**, the Proponent proposes to implement a level crossing strategy to review level crossings and determine works required to meet current standards. Closure of level crossings on public roads would be undertaken in accordance with the *Transport Administration Act 1998*.

Parkes Shire Council's submission stated that it would need to consider the impacts of the proposal on level crossings on public roads. TfNSW requested the Proponent undertake stage two of its level crossing strategy as part of the EIS and undertake further assessment of the crossings on the State and regional roads. The Submissions Report reviewed existing traffic conditions on The McGrane Way and Henry Parkes Road and concluded there was sufficient queuing space on these main roads. The Proponent has committed to consult the road authority on upgrades to and level crossing closures.

The Department has recommended a condition to require the Proponent to prepare a Public Level Crossing Treatment Report to identify crossings that will be upgraded or closed, describe the treatment of the upgraded crossing and justify any proposed crossing closures. The Proponent would be required to undertake consultation with the RMS and Parkes and Narromine Councils. The Public Level Crossing Treatment Report must be conducted in accordance with the Australian Level Crossing Assessment Model (ALCAM). The report must also include an assessment of the road risks, consistent with the guideline *Railway Crossing Safety Series 2011, Plan: Establishing a Railway Crossing Safety Management Plan*.

The Proponent has committed to review the operation of level crossing treatments once the proposal commences operation. The Department is supportive of this commitment and has recommended a condition to require the Proponent to review the performance of the upgraded level crossing treatments and document the outcomes of the review in a Level Crossing Performance Report. The review would be undertaken within 12 months and at 10 years of the operation of the proposal. The performance review would assess the level of service at each public road level crossing, assess the performance of treatment carried out and identify additional mitigation measures, if required. This would ensure that level crossing treatments are appropriate and effective, and if residual adverse traffic impacts are identified, additional measures are implemented.

Operational Traffic Impacts

Operation of the proposal will generate some maintenance and operational traffic, however, the total number of vehicle movements will be minimal and not expected to create an adverse impact on the operation of the road network. The key operational traffic impact of the proposal will be travel time on the road network as a result of increased train activities at level crossings. The traffic assessment notes that on busier roads, such as Henry Parkes Way, there is sufficient room for traffic to queue without obstructing any major intersections.

The Department is satisfied the operation of the proposal, in terms of traffic generation, will have minimal impact on the capacity of the road network and its level of service. The operational impacts of the change in the design of the Parkes North-West Connection, replacement of the proposed Brolgan Road overbridge with a level crossing, and keeping Coopers Road open with a level crossing, will have localised impacts through delays at the new level crossings during train passbys. However, the operational impacts are considered to be minimal in view of the low level of traffic movements on both roads.

Property Access During Operation

Impacts to property access during operation of the proposal was raised as an issue in submissions from community members who were concerned about not being able to exit or enter their properties as desired due to more frequent train movements, or as a result of a train being parked in a passing loop which extends over their driveway.

The Department acknowledges there will be some inconvenience to landowners with regards to more frequent train movements, potentially causing more frequent delays at level crossings. However, it is noted this impact will in part be mitigated by the faster speeds of the trains and the Department is satisfied that it is unlikely residents would experience a delay at every attempt to enter or exit their property, or cross the rail line within their property.

With regard to access restrictions from passing loops extending over driveways, the Department concurs with the community that this presents an unacceptable impact as parked trains may cause sight distance issues if driveways are adjacent to them, or block access and egress to a property. The Department has therefore recommended a condition which prohibits passing loops from passing over any public or private road unless agreed with by the relevant landowner.

Conclusion

The Department notes the proposal has different construction and operational traffic impacts. During construction the movement of construction vehicles is the key risk, however, the additional traffic generated by the proposal will not adversely affect traffic movements on the road network, and the existing peak period level of service would be maintained.

The operational traffic generated by the proposal is minimal. The key operational traffic impact relates to the frequency of train movements at level crossings. The increase in train frequency will result in increased delays for road users, although the delay time at crossings will reduce as train speeds increase. The Department considers that a review of the performance of level crossing treatments at 12 months and 10 years after operation, would identify the effectiveness of crossing treatments and the need for further treatment measures.

5.8. Other Issues

The Proponent has also assessed the potential impacts of the proposal in relation to soils and water, heritage, visual amenity, lighting, air quality, waste generation, climate change and cumulative impacts associated with concurrent proposals. The Department is of the opinion that the Proponent has undertaken an adequate assessment of the issues. Although these issues can generally be managed through the use of standard best practice management measures, conditions are required to ensure that all impacts are appropriately mitigated and managed, The Department's consideration of these is provided below.

Soils and Contamination

The Proponent's assessment indicates that it is unlikely that saline or acid sulfate soils would be encountered during construction or operation of the proposal. Illegally dumped materials which could contain, or have contained, contaminants, were identified during preliminary site investigations.

The Department recognises the potential for further discovery of contaminated soils across the proposed rail corridor during excavation works and has recommended the preparation of a Site Contamination Assessment Report where contaminated land is identified. It has also recommended that should remediation be required, a Site Audit Statement and Site Audit Report must be prepared by a NSW EPA Accredited Site Auditor.

Surface Water Quality

The Proposal is located within the Macquarie-Bogan River Basin and the Lachlan River Basin and will traverse a number of ephemeral watercourses with a stream order of three or more. To mitigate the impacts to water quality from the construction and operation of the Proposal, the Proponent has committed to:

- designing components, such as culverts, flow discharge points and erosion and sediment protection mechanisms, to minimise water quality impacts;
- implementing construction erosion and sediment control measures designed to cope with a 10 per cent AEP rainfall event; and
- developing and implementing a surface water monitoring framework to monitor water quality at discharge points and selected locations.

The Department considers that the proposed construction mitigation measures are appropriate to manage the erosion and sedimentation risk to water quality from excavation and disturbance of soils during construction. Notwithstanding, it has recommended that the Proponent prepare a Construction Soil and Water Quality Management Plan which would detail the proposed erosion, sedimentation and water quality management measures that would be implemented during construction.

The EIS indicates that water required for construction activities such as dust suppression may include recycled/treated water from Parkes North and Peak Hill mines. Such waters may pose a contamination risk if not adequately treated. The Department has recommended a condition of approval requiring the Proponent to ensure that the quality of recycled water used during construction is such that it will not pose a risk to human health or the receiving environment.

Groundwater

The EIS indicated that groundwater generally exists between twenty and sixty metres below the surface, with occasional shallow alluvial sediments occurring at least ten metres below the surface.

As the construction of the proposal does not involve excavations at great depths, the Department is satisfied the CSSI is unlikely to intercept alluvial or groundwater aquifers, and that the Proponent's proposed groundwater management measures are appropriate in the unlikely event that groundwater is intercepted. As a safeguard, the Department has recommended that the proposal must be designed and constructed to ensure that there is no permanent interception of groundwater.

Aboriginal Heritage

Searches of the Aboriginal Heritage Information Management System (AHIMS) identified 19 Aboriginal heritage sites within 50 metres of the proposal of which nine are within or less than 10 metres away. Although the majority of the sites contain stone artefacts, three scarred trees have also been recorded. The field survey to inform the EIS identified two known AHIMS sites within the proposal boundary (35-3-0206 and 43-3-0111) and two known AHIMS on the proposal boundary (35-3-0207 and 35-3-0208). No new Aboriginal heritage sites were discovered. The Proponent does not anticipate encountering the remaining listed AHIMS sites during construction or operation as a gas pipeline, which included its own Aboriginal heritage survey and salvage program, was recently constructed in the area.

The Department acknowledges that the current rail corridor has been subject to extensive disturbance with areas inside the corridor assessed as having low archaeological potential. However, eight areas of moderate or higher archaeological potential have been identified within the proposal area outside of the current rail corridor. These areas include four of the previously recorded archaeological sites identified during the survey. The archaeological significance of the sites is considered to be low within the rail corridor and moderate to high outside of the rail corridor.

Overall, the Department considers that the construction of the proposal would not have a significant impact on known Aboriginal sites and areas of archaeological potential. The EIS makes a number of recommendations in regards to Aboriginal heritage. The Department considers that the recommended mitigation measures would provide an appropriate framework to manage potential impacts during construction and has consequently recommended their inclusion in the instrument of approval, including:

- protection and avoidance of AHIMS site 35-3-0207 (scarred tree);
- avoidance, if possible, of AHIMS sites 35-3-0206, 35-3-0208 and 43-3-0111 and if not, recording and salvage of the sites by a suitably qualified archaeological heritage specialist and registered Aboriginal stakeholder prior to any disturbance; and
- preparation of a Construction Heritage Management Sub-plan which includes procedures for salvaging and safekeeping of Aboriginal objects, managing previously unidentified Aboriginal objects, managing the discovery of confirmed or potential human remains and ongoing Aboriginal consultation during construction.

Non-Aboriginal Heritage

No non-Aboriginal heritage listed items are located within or in the immediate vicinity of the proposal. The nearest listed item is the Peak Hill Police Station and Official Residence which is listed on the NSW Police Force's section 170 register and is located some 750 metres east of the proposal at Peak Hill.

Structures with heritage potential within or adjoining the proposal boundary are predominantly rail related and include the rail line, culverts, former stations, and grain silos and sidings. A derelict cottage adjacent to the rail corridor at Wyanga (Wyanga Cottage) and another old cottage located at Tomingley West about 100 metres from the rail corridor are also considered to be structures with heritage potential. An assessment of significance considered the items to be generally of local significance.

The Proponent has indicated that Wyanga Cottage will not be directly impacted by the proposal as it is outside of the rail corridor, however it may be indirectly impacted by vibration emitted from the proposal. Accordingly, the Department has recommended that the Proponent implement measures to ensure that Wyanga Cottage is not directly or indirectly impacted by construction of the proposal and that these be detailed in a Construction Heritage Management Sub-plan.

The Department has also recommended that the Proponent undertake photographic archival recording of potential heritage associated with the rail line which would be demolished consequent to the construction of the proposal.

Landscape and Visual Amenity

The existing visual landscape along the length of the alignment is predominantly rural and agricultural, with intermittent changes to rural-residential and semi-urban in the towns and villages of Parkes, Narromine, Peak Hill and Alectown. The Proponent has undertaken a visual assessment to establish the potential impact of the proposal on visual amenity, considering both the potential sensitivity of receivers and landscape character impacts.

The EIS states that the existing rail track and associated rail infrastructure forms the main visual feature in the landscape, and the primary visual receivers of the proposal are road and rail users who travel momentarily past the proposal. The Department acknowledges that the existing rail line is largely screened by native grasses, native vegetation, crops and agricultural infrastructure due to its relatively low profile. Upon completion of construction, the main visual changes to the landscape would be:

- increased formation/rail track height;
- new sections of track at crossing loops;
- spoil mounds;
- Parkes North-West Connection; and
- longer and higher trains.

The visual assessment concluded that the upgraded rail formation would result in a low visual impact. The Department agrees with this conclusion and notes that the number of viewers would be limited to transient motorists who pass alongside or over the track on existing roads or homeowners adjacent to the rail line. However, the new crossing loops would have a moderate level of visual impact and the visual impacts of the Parkes North-West Connection would be medium to high as it would be a new element in the landscape.

The Department acknowledges that there are very few measures that can be implemented within the rail corridor to screen the heightened rail line or to minimise the impacts of the new crossing loops and Parkes North-West Connection. The Proponent indicates that the proposed spoil mounds could be used to provide some screening of the tracks and trains. However, the spoil mounds themselves will create a visual impact and need to be formed and landscaped in a manner which reduces their visual impact. Consequently, the Department has recommended that the Proponent consult with landowners whose visual amenity from their residence has been identified as being highly impacted with the aim of developing and implementing mitigation measures, such as screen planting, to maintain their visual amenity.

Lighting

The Dark Sky Planning Guideline (DSPG) informs state and local government, professionals and the community about the management of light within 200 kilometres of the Siding Spring Observatory in Coonabarabran. Management of light in this region is important because the telescopes at Siding Spring Observatory require clear dark nights to operate effectively. The proposal is located within 200 kilometres of Siding Spring Observatory.

The Department is generally satisfied that operational lighting would be limited to lights associated with rolling stock, and would be consistent with the type and brightness of light currently generated by rolling stock. However, there is the potential for construction lighting to create impacts. Consequently, the Department has recommended that construction and operation of the proposal comply with the *Australian Standard AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting (AS 4282)*, considers the Good Lighting Design Principles documented in the DSPG, and be generally designed to minimise off-site light spill.

Air Quality

During construction, particulate matter would be mostly generated by construction activities including excavation, materials handling and the operation of machinery and plant. Air quality impacts during construction are proposed to be managed in accordance with standard dust control measures. This includes the use of water for dust suppression, maintenance of vehicles and equipment and monitoring dust generating activities. The Department supports the Proponent's commitment to prepare a Construction Air Quality Management Plan to document the proposed air quality mitigation measures and has reinforced this commitment in the recommended conditions of approval.

There are currently no emissions standards in Australia that address air quality emissions from locomotives. Local and regional air quality impacts from diesel locomotives using the upgraded track (up to an additional 15 trains per day by 2040) are expected to be minimal. The Proponent commits to complying with any operational air quality requirements of its EPL.

Climate Change Risk

The risks to the proposal from climate change include impacts from an increase in average temperatures and extreme heat events, changes to rainfall intensity and frequency, changes to storm intensity and increased wind.

The Proponent has committed to continuing climate change risk assessment process as the design progresses to ensure adaptation measures are incorporated into the design where practicable. Measures considered include appropriately designed drainage and embankments to deal with high rainfall events, and consideration of the heat tolerances of track to minimise buckling during extreme heat events.

Cumulative Impacts Associated with Concurrent Proposals

The length of the proposal predisposes it to cumulative impacts where it comes in proximity to another project. The Proponent identified three mining projects, a hospital redevelopment, and two water infrastructure projects as currently existing in proximity to the proposal. A further separate hospital redevelopment, an intermodal terminal, and two solar farms are also proposed, or approved but yet to be constructed, in proximity to the proposal. TfNSW identified the Newell Highway Upgrade as being located close to the proposal.

However, the Department considers the proposal is unlikely to cause significant cumulative impacts to sensitive receivers or their environment when it is in proximity to these proposals. In relation to the Newell Highway upgrade works, the Proponent advised it would liaise with RMS to determine any potential interactions and develop and implement measures to minimise any cumulative impacts to nearby sensitive receivers. This would be addressed through the CEMP.

6. CONCLUSIONS AND RECOMMENDATIONS

Need and Justification

Australia's freight task is growing with domestic freight volumes anticipated to increase by 80 per cent by 2030. The existing Melbourne to Brisbane rail line is constrained by the congested Sydney network and circuitous coastal route. It also bypasses Australia's most productive agricultural regions, including those in NSW. A new inland standard-gauge rail connection is essential to meet Australia's growing freight challenge to provide a resilient freight rail network.

The NSW freight network supports economic growth in NSW by connecting regional NSW to domestic and international markets. The *Future Transport Strategy 2056 (2018)*, *Regional NSW Service and Infrastructure Plan (2018)* and *State Infrastructure Strategy 2018-2038 (2018)* recognise Inland Rail as a vital part of the solution to improving freight movements by facilitating intercity and intracity freight transport connections.

The Parkes to Narromine proposal is the first component of Inland Rail proposed to be constructed in NSW. The Department considers that the Parkes to Narromine proposal is justified in its own right as it will increase the current capacity of the freight network in regional NSW and provide a link to the existing Broken Hill rail line, allowing a continuous movement of freight to and from the west to the north-south freight corridor. The proposal will also unlock the future economic potential in the region and support the regional agricultural industry by providing an improved rail network which has the potential to connect with regional intermodal facilities.

Key Considerations

Key impacts of the proposal include noise and vibration, biodiversity, flooding, property and land use, and traffic, particularly matters relating to access via public level crossings. Other matters which require consideration include the location of spoil mounds and construction ancillary facilities as these have the potential to impact on amenity, biodiversity and flooding. The Department has assessed the merits of the proposal taking into consideration the issues raised in all submissions and is satisfied that the impacts have been satisfactorily addressed in the Proponent's EIS and Submissions Report and the Department's recommended conditions of approval.

A proposal of this scale would inevitably have residual impacts, the Department has recommended conditions, following input received through public and local and State government submissions, that balance environmental values and public amenity with the needs of construction including:

- stringent requirements relating to noise mitigation including periods of respite, implementation of operational noise mitigation measures during the first six months of construction and receiver consultation through implementation of a comprehensive Construction Noise and Vibration Management Sub-plan;
- offsetting of biodiversity impacts;
- requirements limiting flood afflux, flood inundation times and flow velocities exiting the rail corridor;
- confirmation of flood impacts and the adequacy of proposed flood mitigation measures through additional flood modelling and flood reviews;
- locational criteria for construction ancillary facilities and the placement of spoil mounds;
- requirements for protection of property and access including dilapidation surveys and consultation with landowners where access is required on private property;
- landowner consultation on the consolidation and upgrading of private level crossings; and
- a requirement to prepare a public level crossing treatment report which justifies the types of treatments to be applied.

The proposal would comply with the objects of the EP&A Act and with the principles of ESD.

Recommendation

The Department considers that on balance the proposal is in the public interest and is justified in terms of increasing the capacity and reliability of the State's rail freight network and meeting the State government's objectives and priorities for improved freight transport. The Proponent has undertaken an adequate assessment of the impacts of the proposal and demonstrated that it can be constructed and operated within acceptable environmental limits. It is therefore recommended that the proposal be approved subject to the Department's recommended conditions of approval.



Glenn Snow
A/ Executive Director
Priority Projects



David Gainsford
A/ Deputy Secretary
Planning Services

APPENDIX A - ENVIRONMENTAL IMPACT STATEMENT

See the Department's website at

http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7475

APPENDIX B - SUBMISSIONS

See the Department's website at

http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7475

APPENDIX C - PROPONENT'S SUBMISSIONS REPORT

See the Department's website at

http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7475

**APPENDIX D – ADDENDUM TO THE INLAND RAIL – PARKES TO
NARROMINE BIODIVERSITY ASSESSMENT REPORT**



Our Ref: 3606/JM/AR/RP/20180412

12 April 2018

Sarah Harris
Environment Manager P2N
Australian Rail Track Corporation
Level 15, 60 Carrington Street
Sydney NSW 2000

Dear Sarah

Re: Addendum to the Inland Rail – Parkes to Narromine Biodiversity Assessment Report comprising vegetation mapping amendments and inclusion of temporary impacts

At the request of the Office of Environment and Heritage (OEH) Umwelt has amended the vegetation map and associated BioBanking Credit Calculator assessments for the Parkes to Narromine (P2N) section of the Melbourne to Brisbane Inland Rail project (the proposal). Outlined below is the methodology used to address the comments made by OEH in relation to the mapping of derived native grassland communities within the development site, as specified in correspondence from Peter Christie of OEH in letters dated 2 and 16 March 2018, and subsequent discussions between OEH, ARTC and Umwelt.

In addition to the amendments to the vegetation mapping, ARTC has committed to the re-assessment of all native vegetation within the development site in order to determine a maximum potential impact associated with the proposal. Therefore the BioBanking Credit Calculator has been updated to add in those areas of the development site that were previously mapped as temporary impacts and not subject to credit generation.

1.0 Approach

The correspondence from OEH dated 16 March 2018 required a methodology for reviewing areas previously mapped as non-native grassland and where relevant re-mapping these areas as native vegetation.

As agreed with OEH, the remapping was undertaken using a desktop approach comprising the following steps:

- Review of regional vegetation mapping products, including the Central West Lachlan State Vegetation Map (2016) prepared by OEH and the NSW Landuse Map (2013). The 2016 OEH regional mapping was overlaid on the site specific mapping to identify areas where the regional mapping product maps native vegetation in areas mapped by Umwelt as non-native.

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These areas were then cross-checked with the NSW Landuse Map (2013). This identified areas where a change from non-native to native vegetation may have been required.

- Each of these areas were then reviewed against the site specific data held by Umwelt including:
 - Review of existing field data including plot/transects, rapid vegetation assessments and annotated maps with field notes
 - Aerial photography interpretation (API)
 - Where the above steps identify potential native grassland, the vegetation mapping was updated to reflect this change.
 - Where there was any uncertainty due to lack of site specific data, or any other uncertainty, as directed by OEH, the vegetation mapping was by default mapped according to the 2016 regional mapping undertaken by OEH. In the case of native grasslands, where a derived form of native grassland was mapped by the 2016 regional mapping, these areas were attributed to one of the five derived native grassland vegetation zones already mapped by Umwelt.

The revised mapping was then provided to OEH for review and approval, with Renee Shepherd (OEH Senior Conservation Planning Officer) confirming acceptance of the updated vegetation mapping on 11 April 2018. The revised vegetation zones were then entered into the BioBanking Credit Calculator, with the entire development site adopted as the area of direct impact. The development site was previously divided into areas of permanent impacts and proposed temporary impacts, however, in the revised assessment it was conservatively assumed that all areas would be fully cleared / impacted. This process determined the maximum quantum of credits that would be required to offset the proposal. The BioBanking Credit Calculator assessment follows the methods described in Section 2 of the Inland Rail – Parkes to Narromine Biodiversity Assessment Report (BAR) (Umwelt 2017) in accordance with the *Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects* (FBA).

In addition to changes to the vegetation mapping, the complete removal of the site values has been assumed across the development site within the BioBanking Credit Calculator.

Due to the above described amendments, as discussed with OEH, there was a minor shortfall in the number of plots/transects required by the FBA methodology for two vegetation zones. As agreed with OEH, the relevant plots/transects with the highest site values for these vegetation zones were duplicated to meet this shortfall, including:

- **Assessment Area 1 - Lachlan CMA/Lower Slopes IBRA SR** – Zone 13 – CW213, LA218– White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion– Moderate to Good Condition – Derived Native Grassland required three plots/transects, of which one has been completed. P41 was duplicated twice to meet the minimum survey effort requirements of the FBA methodology.
- **Assessment Area 3 - Central West CMA/Bogan Macquarie IBRA SR** – Vegetation Zone 5 – CW104, LA105– Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions – Moderate to Good – Derived Native Grassland requires four plots/transects, of which three have been completed. P15 was considered to have the highest site values and was duplicated to meet the minimum survey effort requirements of the FBA methodology.

2.0 Results

The below sections detail the changes to the ecosystem credit and species credit requirements as a result of the vegetation mapping amendments and inclusion of temporary impacts in the assessment of direct impacts.

2.1 Ecosystem Credits

Table 1 below provides a comparison of the Development Footprint impacts according to the original BAR (Umwelt 2016) and this Addendum. The revised mapping GIS files have been provided to OEH.

Table 1 –BAR (Umwelt 2016) and Addendum Impact Areas

| Veg Zone | PCT ID (BVT IDs) and PCT Name | Condition Class | TEC | Area in Development Footprint (ha) | |
|----------|--|-----------------------------|------------|------------------------------------|----------|
| | | | | BAR | Addendum |
| 1 | PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | Yes | 3.47 | 4.74 |
| 2 | PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | <i>Moderate to Good</i> | Not listed | 0.87 | 0.87 |
| 3 | PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | <i>Low_Regeneration</i> | Not listed | 0.62 | 0.62 |
| 4 | PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | <i>Moderate to Good</i> | Not listed | 1.12 | 1.11 |
| 5 | PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | <i>Moderate to Good_DNG</i> | Not listed | 7.12 | 28.29 |
| 6 | PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt | <i>Moderate to Good</i> | Not listed | 1.95 | 1.95 |
| 7 | PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | <i>Moderate to Good</i> | Yes | 10.13 | 10.19 |
| 8 | PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | <i>Moderate to Good_DNG</i> | Yes | 32.06 | 51.97 |
| 9 | PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) | <i>Moderate to Good</i> | Not listed | 3.38 | 3.38 |
| 10 | PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly | <i>Moderate to Good_DNG</i> | Not listed | 14.45 | 20.08 |

| Veg Zone | PCT ID (BVT IDs) and PCT Name | Condition Class | TEC | Area in Development Footprint (ha) | |
|--------------|---|-----------------------------|-----|------------------------------------|---------------|
| | | | | BAR | Addendum |
| | in the temperate (hot summer) climate zone of central NSW (wheatbelt) | | | | |
| 11 | PCT201 (CW138, LA145) Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | Yes | 1.88 | 1.88 |
| 12 | PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | Yes | 3.24 | 3.87 |
| 13 | PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | <i>Moderate to Good_DNG</i> | Yes | 0.57 | 4.56 |
| 14 | PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | Yes | 7.16 | 7.16 |
| 15 | PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | <i>Moderate to Good_DNG</i> | Yes | 13.96 | 19.80 |
| - | Cleared/Non-native vegetation | - | - | 820.76 | 762.26 |
| Total | | | | 922.74 | 922.74 |

Table 2 includes the areas of threatened ecological communities (TECs) under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) associated with each vegetation zone.

Table 2 – Plant community types recorded in the development site and the corresponding impacts on threatened ecological communities listed under the BC Act and EPBC Act

| Veg Zone | PCT ID (BVT IDs) and PCT Name | Condition Class | Disturbance Area (ha) and Listing Status |
|----------|--|-------------------------|---|
| 1 | PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | 4.74 ha of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions EEC listed under the BC Act to be impacted 1.69 ha Weeping Myall Woodlands EEC listed under the EPBC Act |
| 2 | PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | <i>Moderate to Good</i> | Not listed under the BC Act or EPBC Act |

| Veg Zone | PCT ID (BVT IDs) and PCT Name | Condition Class | Disturbance Area (ha) and Listing Status |
|----------|--|-----------------------------|---|
| 3 | PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | <i>Low_Regeneration</i> | Not listed under the BC Act or EPBC Act |
| 4 | PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | <i>Moderate to Good</i> | Not listed under the BC Act or EPBC Act |
| 5 | PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | <i>Moderate to Good_DNG</i> | Not listed under the BC Act or EPBC Act |
| 6 | PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt | <i>Moderate to Good</i> | Not listed under the BC Act or EPBC Act |
| 7 | PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | <i>Moderate to Good</i> | 7.39 ha of <i>Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions</i> EEC listed under the BC Act to be impacted 9.50 ha <i>Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia</i> EEC listed under the EPBC Act |
| 8 | PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | <i>Moderate to Good_DNG</i> | 36.69 ha of <i>Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions</i> EEC listed under the BC Act to be impacted 51.97 ha <i>Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia</i> EEC listed under the EPBC Act |
| 9 | PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) | <i>Moderate to Good</i> | Not listed under the BC Act or EPBC Act |
| 10 | PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) | <i>Moderate to Good_DNG</i> | Not listed under the BC Act or EPBC Act |
| 11 | PCT201 (CW138, LA145) Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | 1.88 ha of <i>Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions</i> EEC listed under the BC Act to be |

| Veg Zone | PCT ID (BVT IDs) and PCT Name | Condition Class | Disturbance Area (ha) and Listing Status |
|----------|---|-----------------------------|---|
| | | | impacted Not listed under the EPBC Act |
| 12 | PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | 3.87 ha of <i>White Box Yellow Box Blakely's Red Gum Woodland</i> EEC listed under the BC Act to be impacted 1.70 ha <i>White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands</i> CEEC listed under the EPBC Act |
| 13 | PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | <i>Moderate to Good_DNG</i> | 4.56 ha of <i>White Box Yellow Box Blakely's Red Gum Woodland</i> EEC listed under the BC Act to be impacted 4.56 ha <i>White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands</i> CEEC listed under the EPBC Act |
| 14 | PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | 7.16 ha of <i>White Box Yellow Box Blakely's Red Gum Woodland</i> EEC listed under the BC Act to be impacted 7.16 ha <i>White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands</i> CEEC listed under the EPBC Act |
| 15 | PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | <i>Moderate to Good_DNG</i> | 19.80 ha of <i>White Box Yellow Box Blakely's Red Gum Woodland</i> EEC listed under the BC Act to be impacted 19.80 ha <i>White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands</i> CEEC listed under the EPBC Act |

Table 3 below includes a comparison of the number of ecosystem credits required according to the original BAR (umwelt 2016) and this addendum. A total of 5,911 ecosystem credits are required as a result of vegetation mapping amendments and assumption that the entirety of the development site is fully impacted. Refer to **Attachment 1** for the Biodiversity Credit Reports.

Table 3 – BAR and Addendum Ecosystem Credit Requirements

| Veg zone | PCT ID (BVT IDs) and PCT Name | Condition Class | TEC | Addendum Development Footprint (ha) | Ecosystem Credits Generated | |
|----------|---|-------------------------|------------|-------------------------------------|-----------------------------|----------|
| | | | | | BAR | Addendum |
| 1 | PCT26 (CW205, LA212) Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | Yes | 4.74 | 146 | 219 |
| 2 | PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland | <i>Moderate to Good</i> | Not listed | 0.87 | 46 | 46 |

| Veg zone | PCT ID (BVT IDs) and PCT Name | Condition Class | TEC | Addendum Development Footprint (ha) | Ecosystem Credits Generated | |
|----------|---|-----------------------------|------------|-------------------------------------|-----------------------------|----------|
| | | | | | BAR | Addendum |
| | wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | | | | | |
| 3 | PCT36 (CW183, LA193) River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | <i>Low_Regeneration</i> | Not listed | 0.62 | 8 | 8 |
| 4 | PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | <i>Moderate to Good</i> | Not listed | 1.11 | 49 | 57 |
| 5 | PCT55 (CW104, LA105) Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | <i>Moderate to Good_DNG</i> | Not listed | 28.29 | 293 | 1352 |
| 6 | PCT70 (CW220, LA223) White Cypress Pine woodland on sandy loams in central NSW wheatbelt | <i>Moderate to Good</i> | Not listed | 1.95 | 38 | 48 |
| 7 | PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | <i>Moderate to Good</i> | Yes | 10.19 | 473 | 562 |
| 8 | PCT76 (CW145, LA154) Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | <i>Moderate to Good_DNG</i> | Yes | 51.97 | 556 | 1231 |
| 9 | PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) | <i>Moderate to Good</i> | Not listed | 3.38 | 79 | 188 |
| 10 | PCT244 (CW172, LA178) Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone | <i>Moderate to Good_DNG</i> | Not listed | 20.08 | 35 | 585 |

| Veg zone | PCT ID (BVT IDs) and PCT Name | Condition Class | TEC | Addendum Development Footprint (ha) | Ecosystem Credits Generated | |
|--------------|--|-----------------------------|-----|-------------------------------------|-----------------------------|---------------|
| | | | | | BAR | Addendum |
| | of central NSW (wheatbelt) | | | | | |
| 11 | PCT201 (CW138, LA145) Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | Yes | 1.88 | 70 | 88 |
| 12 | PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | Yes | 3.87 | 169 | 207 |
| 13 | PCT267 (CW213, LA218) White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | <i>Moderate to Good_DNG</i> | Yes | 4.56 | 16 | 159 |
| 14 | PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | <i>Moderate to Good</i> | Yes | 7.16 | 235 | 492 |
| 15 | PCT276 (CW226, LA226) Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | <i>Moderate to Good_DNG</i> | Yes | 19.80 | 348 | 669 |
| - | Cleared/Non-native vegetation | - | - | 762.26 | - | - |
| Total | | | | 922.74 | 2,561 | 5,911* |

*note that due to rounding the biodiversity credit reports total 5,913 ecosystem credits, however according to the BioBanking Credit Calculator the total number of ecosystem credits is 5,911.

2.2 Species Credits

Following the amendments to the vegetation map and the inclusion of temporary impacts, the area of habitat for the koala has been increased accordingly, as detailed in **Table 4**. A total of 711 species credits for the koala are now required to offset the impacts of the proposal on the koala, compared to 491 species credits required according to the BAR (Umwelt 2016).

Table 4 - BAR (Umwelt 2016) and Addendum Koala Species Credit Requirements

| BAR Impact (ha) | Addendum Impact (ha) | BAR Species Credits | Addendum Species Credits |
|-----------------|----------------------|---------------------|--------------------------|
| 18.88 | 27.35 | 491 | 711 |

2.3 Summary

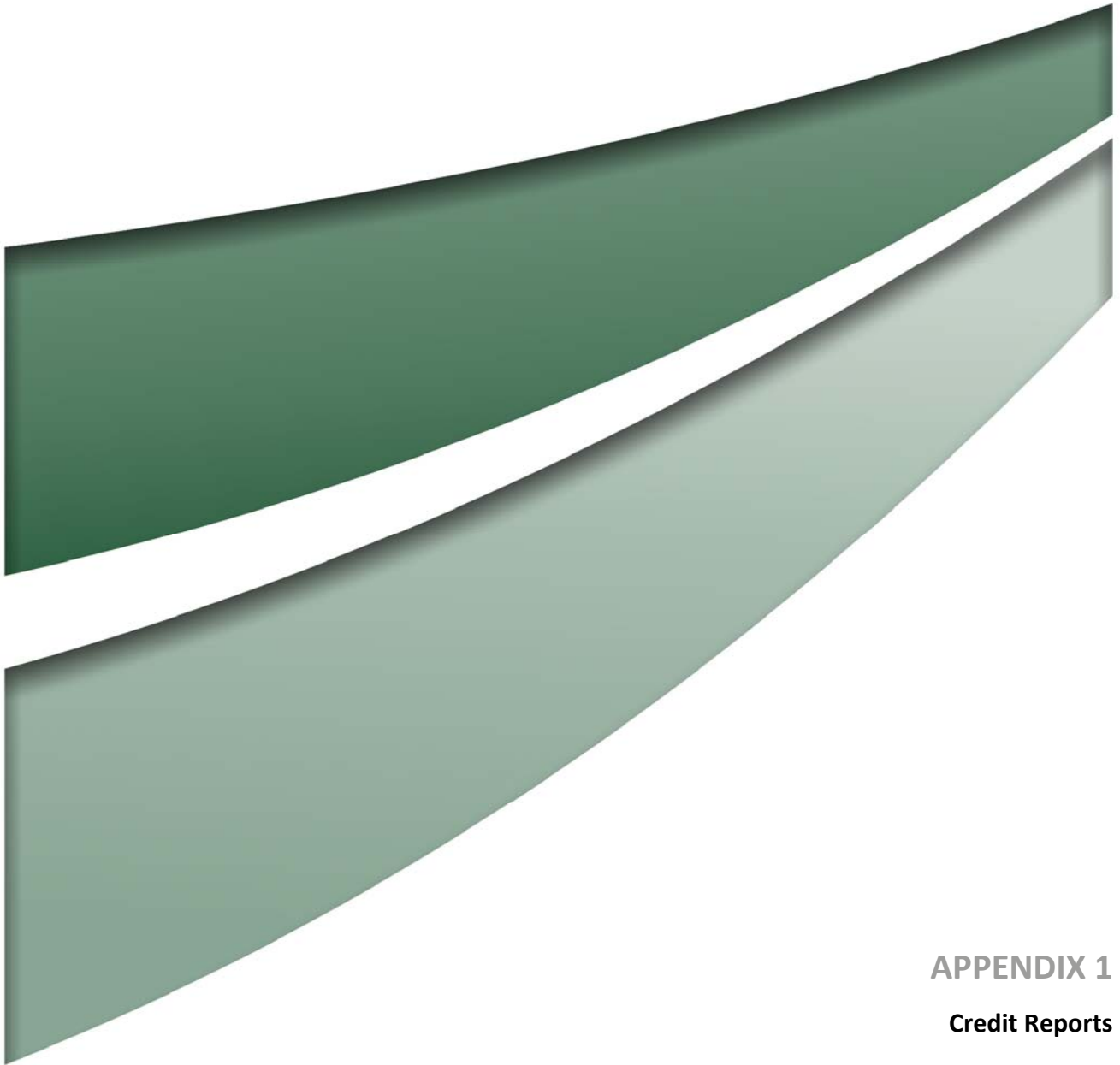
A total of 5,911 ecosystem credits and 711 species credits are required offset the impacts of the proposal. The updated Biodiversity Credit Report is included as **Attachment 1**.

We understand that the actual amount of vegetation that will be directly impacted by the proposal will be subject to further refinement during detailed design and the future biodiversity credits required to offset the proposal may decrease should the detailed design decrease the area of impact.

Yours sincerely

A handwritten signature in black ink, appearing to be 'AR' with a flourish.

Allison Riley
NSW Ecology Manager



APPENDIX 1

Credit Reports

Biodiversity credit report



This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 11/04/2018

Time: 1:54:56PM

Calculator version: v4.0

Major Project details

| | |
|--------------------------------|--|
| Proposal ID: | 0113/2016/3640MP |
| Proposal name: | P2N Assessment Area 3 - Central West CMA/Bogan Macquarie IBRA SR |
| Proposal address: | na Parkes NSW 2870 |
| Proponent name: | Australian Rail and Track Corporation |
| Proponent address: | Level 12, 40 Creek Street Brisbane QLD 4000 |
| Proponent phone: | (07) 3364 8900 |
| Assessor name: | Ryan Parsons |
| Assessor address: | 75 York Street TERALBA NSW 2284 |
| Assessor phone: | 02 4950 5322 |
| Assessor accreditation: | 0113 |

Summary of ecosystem credits required

| Plant Community type | Area (ha) | Credits created |
|--|--------------|-----------------|
| Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions. | 29.17 | 1,398.00 |
| Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion | 0.40 | 19.00 |
| Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt). | 21.33 | 682.00 |
| Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion | 3.11 | 144.00 |
| Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | 18.08 | 516.00 |
| White Cypress Pine woodland on sandy loams in central NSW wheatbelt | 0.80 | 21.00 |
| Total | 72.89 | 2,780 |

Credit profiles

1. Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)

Number of ecosystem credits created

19

IBRA sub-region

Bogan-Macquarie - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|---|
| <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p> | <p>Bogan-Macquarie - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

2. Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (CW145)

| | |
|-------------------------------------|--------------------------------|
| Number of ecosystem credits created | 516 |
| IBRA sub-region | Bogan-Macquarie - Central West |

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|--|
| Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (CW145) | Bogan-Macquarie - Central West and any IBRA subregion that adjoins the IBRA subregion in which the development occurs |

3. Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)., (CW172)

Number of ecosystem credits created

682

IBRA sub-region

Bogan-Macquarie - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|---|
| <p>Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)., (CW172)</p> <p>Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Penneplain Bioregion, (CW144)</p> <p>Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (CW145)</p> <p>Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW, (CW152)</p> <p>Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW, (CW167)</p> <p>Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion, (CW317)</p> | <p>Bogan-Macquarie - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

4. White Cypress Pine woodland on sandy loams in central NSW wheatbelt, (CW220)

Number of ecosystem credits created

21

IBRA sub-region

Bogan-Macquarie - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|---|
| <p>White Cypress Pine woodland on sandy loams in central NSW wheatbelt, (CW220)</p> <p>Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion, (CW144)</p> <p>Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (CW145)</p> <p>Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW, (CW152)</p> <p>Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW, (CW167)</p> <p>Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)., (CW172)</p> <p>Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion, (CW317)</p> | <p>Bogan-Macquarie - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

5. Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions., (CW104)

| | |
|-------------------------------------|--------------------------------|
| Number of ecosystem credits created | 1,398 |
| IBRA sub-region | Bogan-Macquarie - Central West |

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|---|
| <p>Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions., (CW104)</p> <p>Coolabah - River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion, (CW125)</p> <p>Coolabah open woodland wetland with chenopod/grassy ground cover on grey and brown clay floodplains, (CW126)</p> | <p>Bogan-Macquarie - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

6. Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion, (CW205)

| | |
|-------------------------------------|--------------------------------|
| Number of ecosystem credits created | 144 |
| IBRA sub-region | Bogan-Macquarie - Central West |

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|--|
| Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion, (CW205) Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion, (CW204) | Bogan-Macquarie - Central West and any IBRA subregion that adjoins the IBRA subregion in which the development occurs |

Summary of species credits required

Biodiversity credit report



This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 11/04/2018

Time: 1:47:09PM

Calculator version: v4.0

Major Project details

| | |
|--------------------------------|---|
| Proposal ID: | 0113/2016/3632MP |
| Proposal name: | P2N Assessment Area 2 - Central West CMA/Lower Slopes IBRA SR |
| Proposal address: | na Parkes NSW 2870 |
| Proponent name: | Australian Rail and Track Corporation |
| Proponent address: | Level 12, 40 Creek Street Brisbane QLD 4000 |
| Proponent phone: | (07) 3364 8900 |
| Assessor name: | Ryan Parsons |
| Assessor address: | 75 York Street TERALBA NSW 2284 |
| Assessor phone: | 02 4950 5322 |
| Assessor accreditation: | 0113 |

Summary of ecosystem credits required

| Plant Community type | Area (ha) | Credits created |
|---|--------------|-----------------|
| Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions. | 0.23 | 11.00 |
| Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion | 1.48 | 69.26 |
| Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt). | 2.13 | 91.00 |
| River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | 1.49 | 53.97 |
| Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion | 1.63 | 75.47 |
| Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | 21.43 | 594.50 |
| White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | 1.34 | 63.00 |
| White Cypress Pine woodland on sandy loams in central NSW wheatbelt | 0.17 | 4.00 |
| Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | 17.47 | 813.36 |
| Total | 47.37 | 1,776 |

Credit profiles

1. Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)

| | |
|-------------------------------------|-----------------------------|
| Number of ecosystem credits created | 69 |
| IBRA sub-region | Lower Slopes - Central West |

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|--|
| <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p> | <p>Lower Slopes - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

2. Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (CW145)

Number of ecosystem credits created

595

IBRA sub-region

Lower Slopes - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|---|
| Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (CW145) | Lower Slopes - Central West and any IBRA subregion that adjoins the IBRA subregion in which the development occurs |

3. Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)., (CW172)

Number of ecosystem credits created

91

IBRA sub-region

Lower Slopes - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|--|
| <p>Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)., (CW172)</p> <p>Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Penepine Bioregion, (CW144)</p> <p>Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (CW145)</p> <p>Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW, (CW152)</p> <p>Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW, (CW167)</p> <p>Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion, (CW317)</p> | <p>Lower Slopes - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

4. White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, (CW213)

Number of ecosystem credits created

63

IBRA sub-region

Lower Slopes - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|--|
| <p>White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, (CW213)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion, (CW139)</p> <p>White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region, (CW211)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion, (CW226)</p> <p>Apple Box - Rough-barked Apple terrace flats woodland of the southern Brigalow Belt South Bioregion, (CW231)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p> | <p>Lower Slopes - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

5. White Cypress Pine woodland on sandy loams in central NSW wheatbelt, (CW220)

Number of ecosystem credits created

4

IBRA sub-region

Lower Slopes - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|--|
| <p>White Cypress Pine woodland on sandy loams in central NSW wheatbelt, (CW220)</p> <p>Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion, (CW144)</p> <p>Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (CW145)</p> <p>Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW, (CW152)</p> <p>Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW, (CW167)</p> <p>Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)., (CW172)</p> <p>Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion, (CW317)</p> | <p>Lower Slopes - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

6. Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion, (CW226)

Number of ecosystem credits created

813

IBRA sub-region

Lower Slopes - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|--|
| <p>Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion, (CW226)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion, (CW139)</p> <p>White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region, (CW211)</p> <p>White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, (CW213)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Apple Box - Rough-barked Apple terrace flats woodland of the southern Brigalow Belt South Bioregion, (CW231)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p> | <p>Lower Slopes - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

7. Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions., (CW104)

Number of ecosystem credits created

11

IBRA sub-region

Lower Slopes - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|---|
| <p>Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions., (CW104)</p> <p>Coolabah - River Coobah - Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion, (CW125)</p> <p>Coolabah open woodland wetland with chenopod/grassy ground cover on grey and brown clay floodplains, (CW126)</p> | <p>Lower Slopes - Central West and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

8. Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion, (CW205)

| | |
|-------------------------------------|-----------------------------|
| Number of ecosystem credits created | 75 |
| IBRA sub-region | Lower Slopes - Central West |

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|---|
| Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion, (CW205) Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion, (CW204) | Lower Slopes - Central West and any IBRA subregion that adjoins the IBRA subregion in which the development occurs |

9. River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion, (CW183)

Number of ecosystem credits created

46

IBRA sub-region

Lower Slopes - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|--|
| <p>River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion, (CW183)</p> <p>River Red Gum swampy woodland wetland on cowals (lakes) and associated flood channels in central NSW, (CW181)</p> <p>River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW184)</p> <p>Black Tea-tree - River Oak - Wilga riparian low forest/shrubland wetland of rich soil depressions in the Brigalow Belt South Bioregion, (CW237)</p> <p>Blakely's Red Gum x Dirty Gum - White Cypress Pine tall riparian woodland, NSW South Western Slopes Bioregion, (CW240)</p> | <p>Lower Slopes - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

10. River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion, (CW183)

Number of ecosystem credits created

8

IBRA sub-region

Lower Slopes - Central West

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|--|--|
| <p>River Red Gum swampy woodland wetland on cowals (lakes) and associated flood channels in central NSW, (CW181)</p> <p>River Red Gum tall to very tall open forest / woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion, (CW183)</p> <p>River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW184)</p> <p>Black Tea-tree - River Oak - Wilga riparian low forest/shrubland wetland of rich soil depressions in the Brigalow Belt South Bioregion, (CW237)</p> <p>Blakely's Red Gum x Dirty Gum - White Cypress Pine tall riparian woodland, NSW South Western Slopes Bioregion, (CW240)</p> | <p>Lower Slopes - Central West</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

Summary of species credits required

Biodiversity credit report



This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 11/04/2018

Time: 1:39:04PM

Calculator version: v4.0

Major Project details

| | |
|--------------------------------|--|
| Proposal ID: | 0113/2016/3641MP |
| Proposal name: | P2N Assessment Area 1 - Lachlan CMA/Lower Slopes IBRA SR |
| Proposal address: | na Parkes NSW 2870 |
| Proponent name: | Australian Rail and Track Corporation |
| Proponent address: | Level 12, 40 Creek Street Brisbane QLD 4000 |
| Proponent phone: | (07) 3364 8900 |
| Assessor name: | Ryan Parsons |
| Assessor address: | 75 York Street TERALBA NSW 2284 |
| Assessor phone: | 02 4950 5322 |
| Assessor accreditation: | 0113 |

Summary of ecosystem credits required

| Plant Community type | Area (ha) | Credits created |
|---|-----------|-----------------|
| Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | 22.65 | 682.00 |
| White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | 7.09 | 303.44 |
| White Cypress Pine woodland on sandy loams in central NSW wheatbelt | 0.98 | 23.00 |
| Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | 9.49 | 348.41 |
| Total | 40.21 | 1,357 |

Credit profiles

1. White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, (LA218)

Number of ecosystem credits created

303

IBRA sub-region

Lower Slopes - Lachlan

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|---|
| <p>White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, (LA218)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (LA219)</p> <p>Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion, (LA226)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (LA120)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (LA145)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (LA252)</p> | <p>Lower Slopes - Lachlan</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

2. White Cypress Pine woodland on sandy loams in central NSW wheatbelt, (LA223)

Number of ecosystem credits created

23

IBRA sub-region

Lower Slopes - Lachlan

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|---|
| <p>White Cypress Pine woodland on sandy loams in central NSW wheatbelt, (LA223)</p> <p>Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion, (LA152)</p> <p>Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion, (LA153)</p> <p>Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (LA154)</p> <p>Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW, (LA162)</p> <p>Mixed Eucalypt woodlands of floodplains in the southern-eastern Cobar Peneplain Bioregion, (LA163)</p> <p>Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW, (LA175)</p> <p>Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)., (LA178)</p> <p>Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone, (LA194)</p> <p>Yellow Box - River Red Gum tall grassy riverine woodland of NSW South Western Slopes Bioregion and Riverina Bioregion, (LA195)</p> | <p>Lower Slopes - Lachlan</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

3. Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion, (LA226)

Number of ecosystem credits created

348

IBRA sub-region

Lower Slopes - Lachlan

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|---|
| <p>Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion, (LA226)</p> <p>White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, (LA218)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (LA219)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (LA120)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (LA145)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (LA252)</p> | <p>Lower Slopes - Lachlan</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p> |

4. Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (LA154)

| | |
|-------------------------------------|------------------------|
| Number of ecosystem credits created | 682 |
| IBRA sub-region | Lower Slopes - Lachlan |

| Offset options - Plant Community types | Offset options - IBRA sub-regions |
|---|--|
| Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, (LA154) Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone, (LA194) | Lower Slopes - Lachlan and any IBRA subregion that adjoins the IBRA subregion in which the development occurs |

Summary of species credits required

| Common name | Scientific name | Extent of impact Ha or individuals | Number of species credits created |
|-------------|------------------------|---------------------------------------|---|
| Koala | Phascolarctos cinereus | 27.35 | 711 |

APPENDIX E – OEH ASSESSMENT UNDER THE FBA

**Assessment of EPBC Act listed threatened species
and communities using the NSW Framework for Biodiversity Assessment**
Suggested information to be included in the submission

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 or in the vicinity as generated from the Environmental Reporting Tool (ERT) have been identified 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.

(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 the two ecological communities and three species likely to be significantly impacted were identified and credit liabilities were determined. *Tylophora linearis* was considered to possibly be at risk of being impacted, and the ecosystem credits that will be retired to offset impacts to the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC will also provide habitat for this species.

Whilst the minimum number of transects/plots were undertaken for each vegetation zone, OEH believed the number of plots did not adequately account for the variability of vegetation communities and their condition states along the linear development. Liaison between OEH, Umwelt and ARTC, and review of field notes and different mapping products resulted in additional areas of impacts to native vegetation communities being identified after the Response to Submissions document was submitted. This review and update of impacts resulted in additional impacts being identified for all the EPBC Act-listed ecological and threatened species likely to be significantly impacted by the project.

Ecosystem credits have been generated for all EPBC Act-listed ecological communities and threatened species likely to be significantly impacted. In addition, species credit species have been generated for the koala (an EPBC Act-listed species that was not deemed to be significantly impacted by DoEE). Ecosystem credits have been generated for Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion, however it was also not deemed to be significantly impacted by DoEE.

No Biodiversity Offset Strategy (BOS) has been submitted with the FBA. The minimum information requirements for the BOS (Stage 3 of the FBA, Table 22 of the FBA) have not been fulfilled.

(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 and ecological community is likely to occur in the proposal area and whether a subsequent assessment of significance is required has been undertaken (EIS - Commonwealth Matters Assessment, Final, June 2017 – Appendix 1 Table 1).

An assessment of significance for all entities identified by DoEE as being significantly impacted under the EPBC Act has been completed (EIS - Commonwealth Matters Assessment, Final, June 2017 – Appendix 2 Table 1).

Outcomes of the assessment are:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – permanent removal of the CEEC
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia – permanent removal of the CEEC
- Regent Honeyeater – low likelihood of occurrence
- Swift Parrot – proposal area does not contain a population but the project will permanently remove foraging habitat
- *Tylophora linearis* – low potential for the species to occur, not recorded in the proposal area, permanent removal of potential habitat
- Superb Parrot – permanent removal of foraging habitat

(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.

Further information has been sought and provided by the proponent to more accurately determine the extent of MNES in the proposal area. Following an amendment to the vegetation mapping undertaken by the proponent, the area of impact to all MNES was increased. Results are presented at Table 1 and Table 2.

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.

DoEE determined that the following ecological communities and species are likely to be significantly impacted:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia
- Superb Parrot (*Polytelis swainsonii*)
- Regent Honeyeater (*Anthochaera phrygia*)
- Swift Parrot (*Lathamus discolor*)

Tylophora linearis is possibly at risk of being impacted.

The maximum quantum of impact on the threatened species and ecological communities listed above has been determined and the subsequent biodiversity credit requirements have been calculated by the BioBanking Credit Calculator. Measures to avoid and mitigate have been described, and further avoidance is likely to occur following detailed design of the project.

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

The proponent has not yet submitted a Biodiversity Offset Strategy so OEH is unable to comment on whether any residual impacts must be offset. The BOS is required to be submitted within 12 months of commencement of construction. If the biodiversity credit liability is fulfilled in accordance with the *NSW Biodiversity Offsets Policy for Major Projects* no residual impacts will need to be offset.

(c) 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 OEHD disagrees with this finding.

Not applicable.

(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

- Summary of targeted surveys for EPBC Act-listed threatened species – Table 3.1 pg 13, Commonwealth Matters Assessment - Vol 2 Technical Report 4 of EIS
- Direct and permanent impacts of proposal on TECs – Table 3.2 pg 20, Commonwealth Matters Assessment - Vol 2 Technical Report 4 of EIS (**Note**: disregard area of TEC in proposal site – figures have been updated in Addendum to Inland Rail Parkes to Narramine Biodiversity Assessment Report [Umwelt, 12 April 2018])
- Direct and permanent impacts of proposal on threatened species – Table 3.3 pg 21, Commonwealth Matters Assessment - Vol 2 Technical Report 4 of EIS (**Note**: disregard area of habitat in proposal site – has been updated in Addendum to Inland Rail Parkes to Narramine Biodiversity Assessment Report [Umwelt, 12 April 2018])
- Summary of impacts on threatened species and ecological communities – Table 5.1 pg 58, Commonwealth Matters Assessment - Vol 2 Technical Report 4 of EIS
- Threatened species and TECs recorded or with potential to occur within the proposal area, likelihood to occur and requirement for assessment of significance – Table 1 Appendix 1, Commonwealth Matters Assessment - Vol 2 Technical Report 4 of EIS
- Summary of impacts of proposal on MNES including offset in accordance with FBA – Table 5.7 pg 145, Biodiversity Assessment Report – Vol 2 Technical Report 2 of EIS
- Methodology for reviewing areas previously mapped as non-native grassland – Section 1.0 pg 1, Addendum to Inland Rail Parkes to Narramine Biodiversity Assessment Report (Umwelt, 12 April 2018)
- Comparison of development footprint impacts between the BAR and BAR Addendum – Table 1 pg 3, Addendum to Inland Rail Parkes to Narramine Biodiversity Assessment Report (Umwelt, 12 April 2018)
- Plant community types and corresponding impacts to BC Act and EPBC Act-listed entities – Table 2 pg 4, Addendum to Inland Rail Parkes to Narramine Biodiversity Assessment Report (Umwelt, 12 April 2018)
- BAR Addendum ecosystem credit requirements – Table 3 pg 6, Addendum to Inland Rail Parkes to Narramine Biodiversity Assessment Report (Umwelt, 12 April 2018)
- BAR Addendum koala species credit requirements - Table 4 pg 8, Addendum to Inland Rail Parkes to Narramine Biodiversity Assessment Report (Umwelt, 12 April 2018)

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 ¹ | Relevant page numbers in the EIS |
| White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland | Y | PCT267 White Box-White Cypress Pine-Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | Y | 33.22 (EPBC Act) | 1,527 | Review of vegetation mapping resulted in area of impact to MNES increasing from 17.3 ha and 768 credits in the EIS to 33.22 ha and 1,527 credits in the BAR Addendum. | EIS Main Report: pgs 10-7, 10-8 Vol 2, Report 2: pg 145 Vol 2, Report 4: pgs 21, 31, 55-56, 58; Appendix 2 pg 3-5 BAR Addendum: pgs 4, 6, 8 |
| | | PCT276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | | 35.39 (total) | | | |
| Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia | Y | PCT76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | Y | 61.47 (EPBC Act) 62.16 (total) | 1,793 | Review of vegetation mapping resulted in area of impact to MNES increasing from 31.53 ha and 1,029 credits in the EIS to 61.47 ha and 1,793 credits in the BAR Addendum. | EIS Main Report: pgs 10-5, 10-6 Vol 2 Report 2: pg 145 Vol 2, Report 4: pgs 20, 28, 54-55, 58; Appendix 2 pg 5-7 BAR Addendum: pgs 3, 5, 7 |

(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.

¹ Following concerns raised by OEH during the review of the EIS and the Response to Submissions report regarding inadequate identification of impacts to native vegetation, the proponent completed a review of potential impacts as outlined in *Addendum to Inland Rail Parkes to Narromine Biodiversity Assessment Report (Umwelt, 12 April 2018)*. Additional impacts were identified for eight of the nine PCTs impacted by the proposal. These additional impacts included impacts not previously identified, and the inclusion of all “temporary” impacts.

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 ² | Relevant page numbers in the EIS and Appendices |
| <i>Tylophera linearis</i> | EC | PCT70 White Cypress Pine woodland on sandy loams in central NSW wheatbelt (<i>moderate to good condition</i>) | Y | 12.98 | 747 | Review of vegetation mapping resulted in area of impact to MNES increasing from 8.06 ha and 442 credits in the EIS to 12.98 ha and 747 credits in the BAR Addendum. | EIS Main Report: pgs 10-5, 10-7 Vol 2 Report 2: pg 145 Vol 2, Report 4: pgs 21,26, 54-56, 59; Appendix 2 pg 13-15 BAR Addendum: pgs 3-4, 6-8 |
| | | PCT267 White Box-White Cypress Pine-Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (<i>moderate to good condition</i>) | | | | | |
| | | PCT276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (<i>moderate to good condition</i>) | | | | | |
| Superb Parrot | EC | PCT26 Weeping Myall open woodland of the Riverina Bioregion and NSW South West Slopes Bioregion | Y | 160.47 | 5,911 | Review of vegetation mapping resulted in area of impact to MNES increasing from 66.72 ha and 2,561 credits in the EIS to 160.47 ha and 5,911 credits in the BAR Addendum. | EIS Main Report: pgs 10-4-10-8, Vol 2 Report 2: pgs 146 Vol 2, Report 4: pgs 22, 26, 54-56, 59; Appendix 2 pg 15-17 BAR Addendum: pgs 3-8 |
| | | PCT36 River Red Gum tall to very tall open forest/woodland wetland on rivers and floodplains mainly in the Darling Riverine Plains Bioregion | | | | | |
| | | PCT55 Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | | | | | |

² Following concerns raised by OEH during the review of the EIS and the Response to Submissions report regarding inadequate identification of impacts to native vegetation, the proponent completed a review of potential impacts as outlined in *Addendum to Inland Rail Parkes to Narromine Biodiversity Assessment Report (Umwelt, 12 April 2018)*. Additional impacts were identified for eight of the nine PCTs impacted by the proposal. These additional impacts included impacts not previously identified, and the inclusion of all “temporary” impacts.

| | | | | | | | |
|-------------------|----|--|---|-------|-------|---|--|
| | | PCT70 White Cypress Pine woodland on sandy loams in central NSW wheatbelt | | | | | |
| | | PCT76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | | | | | |
| | | PCT201 Fuzzy Box woodland on alluvial brown loam soils mainly in the NSW South West Slopes Bioregion | | | | | |
| | | PCT244 Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) | | | | | |
| | | PCT267 White Box-White Cypress Pine-Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | | | | | |
| | | PCT276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | | | | | |
| Regent Honeyeater | EC | PCT76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | Y | 21.22 | 1,261 | Review of vegetation mapping resulted in area of impact to MNES increasing from 15.10 ha and 877 credits to 21.22 ha and 1,261 credits in the BAR Addendum. | EIS Main Report: pgs 10-5, 10-7, 10-8 Vol 2 Report 2: pgs 147 Vol 2, Report 4: pgs 24, 27, 54-56, 59; Appendix 2 pg 8-10 BAR Addendum: pgs 3-4, 7-8 |
| | | PCT267 White Box-White Cypress Pine-Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | | | | | |
| | | PCT276 Yellow Box grassy tall woodland on alluvium or parna | | | | | |

| | | | | | | | |
|--------------|----|---|---|-------|-------|---|--|
| | | loams and clays on flats in NSW South Western Slopes Bioregion | | | | | |
| Swift Parrot | EC | PCT76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | Y | 21.22 | 1,261 | Review of vegetation mapping resulted in area of impact to MNES increasing from 15.10 ha and 877 credits to 21.22 ha and 1,261 credits in the BAR Addendum. | EIS Main Report: pgs 10-5, 10-7, 10-8 Vol 2 Report 2: pg 147 Vol 2, Report 4: pgs 23, 27, 54-56, 59; Appendix 2 pg 11-13 BAR Addendum: pgs 3-4, 7-8 |
| | | PCT267 White Box-White Cypress Pine-Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | | | | | |
| | | PCT276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | | | | | |

- (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

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 8.4 (pg 8-14) of the EIS Main Report provides criteria that will be used to determine the location of construction compounds. One criterion includes “where no or only minor clearing would be required, and not within areas identified as threatened communities or species habitat”. Whilst four of the compounds in the EIS are currently located in areas of native vegetation including TECs, Section 10.3.2 (pg 10-20) of the EIS Main Report states that the footprint of the project will be refined following the detailed design phase and this will reduce the amount of native vegetation clearing that is required. ARTC have repeatedly verbally indicated approximately 20 percent of the construction compounds identified in the EIS will be required, thereby reducing potential impacts. The EIS also separates “permanent” and “temporary” clearing impacts to biodiversity (Table 10.3 pg 10-20 of main report), with temporary impacts not included in the calculation of the biodiversity credit liability. This approach did not conform with the FBA, and following liaison with OEH the proponent included all temporary impacts to vegetation in the final area of impact as outlined in the *Addendum to Inland Rail Parkes to Narromine Biodiversity Assessment Report (Umwelt, 12 April 2018)* (page 1). OEH is satisfied that the quantum of impacts to PCTs identified in the BAR Addendum represents the potential upper limit of impacts, and it is highly likely that following detailed design these areas of impact to the PCTs will be reduced.

- Section 4.0 of the Commonwealth Matters Assessment addresses the avoidance, mitigation and offset strategies for relevant MNES
- Avoidance measures that will be implemented - Table 4.1 pg 37, Commonwealth Matters Assessment - Vol 2 Technical Report 4 of EIS
- Impact mitigation during construction – Table 4.2 pg 39, Commonwealth Matters Assessment - Vol 2 Technical Report 4 of EIS
- Summary of impacts on threatened species and ecological communities – Table 5.1 pg 58, Commonwealth Matters Assessment - Vol 2 Technical Report 4 of EIS

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 proposal will be limited to the existing rail corridor, which in many places has been previously highly disturbed. Some impacts will occur along roadsides associated with the rail line, and in connection with construction compounds. It is expected that the detailed design will reduce the impacts to PCTs, particularly with regards to the siting of construction compounds.

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 not yet submitted a Biodiversity Offset Strategy (BOS). OEH is unsure as to whether the proposal will have any residual adverse significant impacts. If the biodiversity credit liability is fulfilled in accordance with the FBA no residual impacts will occur.

Given that the BOS has not been submitted OEH is unable to comment on whether 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. The minimum information requirements to the BOS (Table 22 of the FBA) have not yet been fulfilled.

Draft conditions of approval state that the proponent must submit the BOS within 12 months of the commencement of construction, and biodiversity credits must be retired within 12 months of approval of the BOS.

5. 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.

The ongoing issue that OEH had with the environmental assessment was the method used to collect field data. Whilst the proponent completed the minimum number of plots required for each vegetation zone, the number of plots did not adequately account for the variability in vegetation condition along the length of the rail line. In addition, not all areas within the construction impact zone were assessed; either due to a change in the footprint after the field work had been completed or due to not assessing areas of “temporary” impact. Despite numerous requests the methodology used to map vegetation in the proposal area was poorly justified.

This issue has now been addressed in an addendum to the BAR and OEH is satisfied that a more accurate assessment of the potential impacts of the proposal has been undertaken. The review process referenced mapping products that had not been used in the initial assessment. OEH was satisfied with the methodology used by the proponent and the data products are all publicly-available mapping products. The methodology is outlined in the *Addendum to Inland Rail Parkes to Narromine Biodiversity Assessment Report (Umwelt, 12 April 2018)*.

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 |
| White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland | 1,527 | 0 | 0 | The proponent intends to secure land-based offsets to fulfil the biodiversity credit liability. There are currently no ecosystem credits available for purchase on the BioBanking credits register and no expressions of interest have been registered. A credits wanted request has been prepared, and some analysis of potential land-based offsets has been completed. There are credits currently available for purchase for the koala. No detailed information has been provided on how individual ecosystem and species credits will be retired. The draft approval conditions state that the Biodiversity Offset Strategy must be submitted for approval 12 months after commencement of construction. | EIS Vol 1 Part D Appendix L: pgs 24-41. |
| Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia | 1,793 | 0 | 0 | | |
| <i>Tylophora linearis</i> | 747 | 0 | 0 | | |
| Superb Parrot | 5,911 | 0 | 0 | | |
| Regent Honeyeater | 1,261 | 0 | 0 | | |
| Swift Parrot | 1,261 | 0 | 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 F – 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.
- C8 The Flora and Fauna Management Sub-plan must include:
- (a) a weed management plan;
 - (b) a hygiene protocol which includes best-practice management measures for the prevention of contamination by pathogens, non-indigenous regenerative plant material and seed. The protocol must apply to the movement of all tools, vehicles, machinery and personnel; and
 - (c) measures to protect EPBC listed threatened species and ecological communities.
- E14 Any works associated with the CSSI must limit the clearing of native vegetation to the greatest extent practicable.
- E15 Impacts to plant community types must not exceed those identified in the EIS and as amended by the *Addendum to the Inland Rail – Parkes to Narromine Biodiversity Assessment Report comprising vegetation mapping amendments and inclusion of temporary impacts* (Umwelt, dated 12 April 2018).
- E16 The Proponent must prepare and submit to the Secretary a **Biodiversity Offset Strategy** in accordance with the *Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects*, for the retirement of ecosystem and species credits as set out in **Table E1**. The Strategy must be prepared in consultation with OEH and DoEE, and submitted to the Secretary for approval within 12 months of the commencement of construction.

Table E1: Biodiversity Credits to be Retired

| Credit Type | EPBC Act equivalent EEC or habitat of EPBC Act listed threatened species | Number of Credits |
|--|--|-------------------|
| <i>Ecosystem Credits</i> | | |
| PCT26 Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion | Myall Woodland, Superb Parrot | 219 |
| PCT36 River Red Gum tall to very tall open forest/ woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion | Superb Parrot | 54 |
| PCT55 Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions | Superb Parrot | 1409 |
| PCT70 White Cypress Pine woodland on sandy loams in central NSW wheatbelt | Superb Parrot, <i>Tylophora linearis</i> | 48 |
| PCT76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions | Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia EEC Superb Parrot, Regent Honeyeater, Swift Parrot | 1793 |
| PCT201 Fuzzy Box woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion | Superb Parrot | 88 |
| PCT244 Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) | Superb Parrot | 773 |

| | | |
|--|---|------|
| PCT267 White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC Superb Parrot, Regent Honeyeater, Swift Parrot, <i>Tylophora linearis</i> | 366 |
| PCT276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion | White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC Superb Parrot, Regent Honeyeater, Swift Parrot, <i>Tylophora linearis</i> | 1161 |
| <i>Species Credits</i> | | |
| Koala | | 711 |

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

- E17 Plant community types that provide habitat for impacted EPBC Act threatened species must be retired in a manner that achieves “like-for-like” habitat for the species.
- E18 The Proponent may review and update the ecosystem and species credit requirements in **Table E1** to reflect the final impact zone 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 OEH, DoEE and approved by the Secretary.
- E19 The review and update of credit requirements must be undertaken by:
- (a) using the vegetation mapping identified in the *Addendum to the Inland Rail – Parkes to Narromine Biodiversity Assessment Report* (letter from Umwelt dated 12 April 2018); and/or
 - (b) completing verification surveys to confirm the extent, type and condition of native vegetation to be impacted

Where verification surveys are undertaken, they must be in accordance with the *Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects*. Any additional surveys must be undertaken at the time of year when the groundcover is most likely to be predominantly native.

- E20 Within 12 months of the approval of the Biodiversity Offset Strategy, or within another timeframe agreed to by the Secretary, the Proponent must retire the biodiversity credits. 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*;
 - (b) making payments an offset fund that has been developed by the NSW Government;
 - (c) providing supplementary measures.

Note.

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*.
2. Payments under the offset fund (**Condition E20(b)**) do not apply to EPBC Act list communities.
3. Any residual impact on EPBC Act listed threatened species and ecological communities must be offset in accordance with an offset process endorsed by the DoEE.

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, in deciding whether or not to approve a proposal under the Commonwealth *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 this assessment has been prepared based on the information contained in Chapter 10 – Biodiversity; Chapter 26 – Cumulative and Residual Impacts; Appendix L – Parkes to Narromine Biodiversity Offset Strategy (Phase 1); Technical Report 2 – Biodiversity Assessment Report, Technical Report 3 – Aquatic Ecology Assessment; and Technical Report 4 – Commonwealth Matters Assessment and any supplementary information provided during the assessment process (including the Submissions Report) and advice provided by the NSW Office of Environment and Heritage (OEH).

This Appendix is supplementary to, and should be read in conjunction with the assessment included in Section 5.2 of this assessment report which includes the Department's consideration of impacts to listed threatened species and communities, mitigation and offsetting measures for threatened species, including for Matters of National Environmental Significance.

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 5.2 of this report.

In accordance with section 139 of the EPBC Act, in deciding whether or not to approve, for the purposes of section 18 or section 18A of the EPBC Act, the taking of an action and what conditions to attach to such an approval, the Commonwealth Minister must not act inconsistently with certain international environmental obligations, Recovery Plans or Threat Abatement Plans. The Commonwealth 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 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* include encouraging the creation of protected areas which together with existing protected areas will safeguard representative samples of the natural ecosystems occurring therein (particular attention being given to endangered species), as well as superlative scenery, striking geological formations and regions. Additional obligations include using their best endeavours to protect such fauna and flora (special attention being given to migratory species) so as to safeguard them from unwise exploitation and other threats that may lead to their extinction. The 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 Fauna and Flora* (CITES) is an international agreement between governments which seeks to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The recommendations are not inconsistent with CITES as the proposed action does not involve international trade in specimens of wild animals and plants.

Recovery Plans and Approved Conservation Advices

There are Approved Conservation Advice(s) for the Weeping Myall Woodlands (endangered ecological community - EEC), Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (EEC), Regent Honeyeater (Critically Endangered), Swift Parrot (Critically Endangered), and Superb Parrot (Vulnerable). The White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland (critically endangered ecological community – CEEC) does not have an Approved Conservation Advice.

There is a National Recovery Plan under the EPBC Act for the White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland, Regent Honeyeater, Swift Parrot and Superb Parrot. There are no adopted or made Recovery Plans for the Weeping Myall Woodlands EEC and Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC.

- **Weeping Myall Woodlands (Endangered)**

The main threats to the ecological community are clearing and ongoing degradation. Weeping Myall occurs on highly fertile and arable soils where there is significant pressure to clear for cropping. The impacted ecological community is located within the rail corridor and 1.69 hectares will be removed because of the proposal. The approved conservation advice recommends replanting of understorey species where they have been depleted; weed management; and avoidance of the use of fertilisers and herbicides in or near remnants. It is considered these measures can be implemented into construction management plans.

- **Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (Endangered)**

The proposal will remove approximately 62.16 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC, of which 9.5 hectares is remnant woodland, 51.97 hectares is derived native grasslands and 0.69 hectares does not meet the condition thresholds of the EEC under the EPBC Act. The Approved Conservation Advice identifies infrastructure work and fragmentation into small remnants as a threat. The proposed offsets would compensate for the loss of the EEC.

- **White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered)**

The Box-Gum Grassy Woodland is a geographically widespread but a highly fragmented ecological community. Any incremental clearing of the moderate to good condition woodland would decrease the extent and adversely affect habitat. The Recovery Plan aims to achieve no net loss in extent and condition. Although the proposal would require the clearing of 33.22 hectares of the CEEC, offsets are proposed (see Section 5.2), such that the action would not be inconsistent with the Recovery Plan.

- **Regent Honeyeater (*Anthochaera phrygia*) (Critically Endangered)**

The main threats to Regent Honeyeater population are clearing, fragmentation and degradation of its habitat. The National Recovery Plan includes a number of objectives, recommendations and actions relevant to the proposal including maintaining and enhancing the value of Regent Honeyeater habitat and monitoring trends in Regent Honeyeater population size and dispersion.

Although the proposal will remove 21.22 hectares of potential foraging habitat, the Regent Honeyeater was not recorded within the study area despite fauna surveys being undertaken. No breeding habitat will be impacted.

The Department considers that with the implementation of the proposed offset measures (see Section 5.2), the action would not be inconsistent with the objectives of the Recovery Plan. Key actions of the Recovery Plan, including monitoring, would be implemented as part of the Biodiversity Management Plan for the site and offset areas.

- **Swift Parrot (*Lathamus discolor*) (Critically Endangered)**

The main threats to the Swift Parrot population include the loss and alteration of foraging and nesting habitat through forestry activities, including firewood harvesting, and residential, industrial and agricultural development.

Although the proposal will require removal of approximately 21.22 hectares of potential foraging habitat, this habitat is considered to be degraded and low value. There are no known records of swift parrot within 10 kilometres of the proposal and the species was not recorded within the study area.

It is considered the offset measures described in Section 5.2 (securing of offset land) and the monitoring requirements of the Recovery Plan would ensure the long-term objectives of the Recovery Plan can be met.

- **Superb Parrot (*Polytelis swainsonii*) (Vulnerable)**

The main threats and causes for decline in population for the Superb Parrot is the loss and degradation of habitat (including firewood collection and timber production), irrigation and regulated flows, illegal removal of wild birds, road-kills, poisoning and competition for nest hollows.

The proposal will require the clearing of approximately 160.47 hectares of native woodland and grassland communities, considered to be foraging habitat. The National Recovery Plan for the species identifies Blakely's Red Gum (*Eucalyptus blakelyi*) as the most important tree species for breeding in the south-western slopes bioregion, with most breeding events confined to this tree species. As Blakely's Red Gum was not recorded in the study area, breeding habitat is not considered likely to occur.

It is considered the offset measures described in Section 5.2 (securing of offset land) and the monitoring requirements of the Recovery Plan would ensure the long-term objectives of the Recovery Plan can be met.

- ***Tylophora linearis* (Endangered)**

Although the proposal will require the clearing of 35.39 hectares of potential habitat, *Tylophora linearis* was not recorded during surveys. The potential habitat is considered to be highly disturbed and in low condition due to surrounding agricultural practices and disturbance from the rail corridor.

The main threats to this species are grazing, fire and invasion of habitat by introduced weeds, such as Lantana.

The approved conservation advice recommends preparation of fire management strategy, either prevent grazing or manage grazing, weed management, seed collection and implementation of national translocation protocols. It is considered these measures can be implemented through the proposal's construction environmental management plans.

Overall the likely impacts are considered to be minor as the species was not recorded within the study area. The closest record of the species occurs approximately 10 kilometres to the east of the study area within Goobang National Park.

Threat Abatement Plans (TAPs)

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 White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC and Weeping Myall Woodlands EEC)**

While cane toads have the potential to colonise new habitats created by the construction of sediment and detention basins, this species is not known to occur in the region and it is therefore unlikely that disturbance as a result of the proposed action would lead to the presence of cane toads.

- **Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomic* (relevant to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC)**

Phytophthora cinnamomic (*P. cinnamomi*) is a microscopic soil-borne organism that has the ability to cause plant disease and plant death. It is within a group currently referred to as water mould and interferes with the movement of water and nutrients within the roots of plants. It can be spread in water, soil or plant material that contains the pathogen and dispersal is favoured by moist or wet conditions. It can be carried in both overland and subsurface water flows and spread by native and feral animals. Humans, however, have the capacity to disturb and transport more soil than any other vector. Most of the large centres of infestation that exist today in southern temperate Australia occurred as a result of human activity, often as a direct result of the introduction of infected soil or road-building materials to vulnerable un-infected areas.

If *P. cinnamomi* is present, construction related activities have the potential to introduce or spread the pathogen through: the movement of construction vehicles and use of construction

plant and equipment; construction personnel footwear; or the introduction of infected soil or construction material to uninfected areas. The TAP for managing the spread of *P. cinnamomi* identifies actions to minimise its spread to uninfected sites and mitigate impacts at infected sites.

Due to the uncertainty associated with the presence of *P. cinnamomi* within the study area, the Department has recommended that a hygiene protocol be developed and implemented as part of a Construction Flora and Fauna Management Sub-plan to avoid and mitigate the spread of plant disease. Subject to this recommended condition, the Department considers that approval of the proposed action would not be inconsistent with the TAP for disease in natural ecosystems caused by *P. cinnamomi*.

- **Threat Abatement Plan for predation, habitat degradation, competition and disease transmission by feral pigs (relevant to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC)**

Feral pigs impact on native ecosystems and flora and fauna by wallowing, trampling, rooting, tusking or rubbing trees and through consumption of water, animals and plants and transfer of soil organisms. Direct impacts from feral pigs include predation, habitat loss and degradation, competition and disease transmission, which can impact on native flora and fauna.

There are a range of control methods available for feral pigs including trapping, aerial and ground shooting, poisoning, and fencing. It is considered these measures and requirements of the TAP can be addressed by the proposal's construction and operational management plans.

- **Threat abatement plan for competition and land degradation by rabbits (relevant to Regent Honeyeater)**

Rabbits are widely established and abundant in Australia and, with any current or foreseeable techniques, are not able to be eradicated. Given the current resources and techniques available, the focus of management is generally on abating their impacts rather than eradication.

The goal of this TAP is to protect affected threatened species and ecological communities, and prevent further species and ecological communities from becoming threatened.

To achieve this goal, the TAP provides four objectives: strategically managing rabbits; improving knowledge and understanding of rabbit impacts; improving the effectiveness of rabbit control programs; and increasing community awareness of impacts posed by rabbits. Further, the TAP provides a framework for undertaking targeted actions to manage rabbit impacts. Implementation of the recommended control measures such as poison baiting, biological control agents, warren ripping and fumigation, fencing, harbour removal, and shooting, would assist in managing the threat of rabbit impacts. These measures will be required to form part of the proposal's construction and operational management plans.

- **Threat abatement plan for predation by feral cats (relevant to Swift Parrot and Regent Honeyeater)**

Feral cats are significant predators in Australia that interact with native fauna in various ways, including predation, competition for resources and transmission of disease.

Measures to control feral animals can be addressed through construction and operational management plans. The management plans will be required to be consistent with the TAP.

Therefore, the Department considers the approval of the action would not be inconsistent with the TAP.

M.2 REQUIREMENTS FOR DECISIONS ABOUT WORLD HERITAGE PROPERTIES

The Commonwealth determined that the action is not a controlled action for the controlling provision of World Heritage (Section 12 and Section 15A of the EPBC Act) and therefore further consideration is not required.

M.3 REQUIREMENTS FOR DECISIONS ABOUT NATIONAL HERITAGE PLACES

The Commonwealth determined that the action is not a controlled action for the controlling provision of National Heritage (Section 15B and Section 15C of the EPBC Act) and therefore further consideration is not required.

M.4 ADDITIONAL EPBC ACT CONSIDERATIONS

Table 1 contains the additional mandatory considerations, factors to be taken into account, and factors to have regard to under the EPBC Act, in addition 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 Sections 2.3 and 5.6 of the assessment report. | The Department considers that the proposal would result in a range of benefits to State and regional economy through improvements in the efficiency of the 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 proposal; conditions requiring the proposal to be delivered and operate in a sustainable way to protect the environment for future generations and conserving the relevant matters of national environmental significance; advice provided within this report reflects the importance of conserving biological diversity and ecological integrity in relation to the controlling provisions for the proposal; and mitigation measures to be implemented which minimise potential impacts of the proposal on biodiversity within the study area. | The Department considers that the proposal, if undertaken in accordance with the recommended conditions of consent, would be consistent with the principles of ESD. Section 3.6 of the assessment report addresses ESD principles. |

| | | |
|---|---|--|
| 136(2)(e) | Other information on the relevant impacts of the proposed action – the Department is not aware of any relevant information not addressed in this assessment report. | The Department considers that all information relevant to the impacts of the proposal have been taken into account in this assessment. The Department's consideration on key issues is presented in Section 5 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. | All documentation related to the proposal is available at the Department's website www.majorprojects.planning.nsw.gov.au . The Department considers that the biodiversity conditions at Appendix F are a cost-effective means of achieving their purpose. |

M.5 CONCLUSIONS ON CONTROLLING PROVISIONS

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

For the reasons set out in Section 5.2 and this Appendix, the Department recommends that the impacts of the action on ecological communities and threatened species are acceptable, subject to the implementation of the avoidance and mitigation measures described in the EIS, Response to Submissions Report, and the requirements of the recommended conditions of approval.

M.6 OTHER PROTECTED MATTERS

The DoEE 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 – INDEPENDENT FLOOD SPECIALIST REVIEW

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Dear Mary

**INLAND RAIL – PARKES TO NARROMINE (P2N)
INDEPENDENT REVIEW OF HYDROLOGY AND FLOODING ASSESSMENT
PREPARED FOLLOWING RECEIPT OF SUBMISSIONS REPORT, FEBRUARY 2018**

The Department has identified hydrology and flooding as some of the key environmental issues associated with the Inland Rail proposals.

In October 2017 we were commissioned by the Department to undertake an independent review of the hydrology and flooding components of the Inland Rail sector from Parkes to Narromine (**P2N**). In particular the Department requested specific advice concerning

- *“the risks and uncertainties of flooding impacts, given the absence of project details such as the final location of spoil mounds, construction compounds, rail formation heights and culvert placements”;*
- *“the technical adequacy of the Proponent’s assessment of hydrology and flooding impacts”;*
- *“the appropriateness and effectiveness of flood management and mitigation measures”;* and
- *“recommendations for conditions for the construction and operation of the projects should the Department recommend approval”.*

Introduction

During the course of our engagement we have provided feedback and interim reports to the Department addressing the above issues. This letter comprises our final report and summarises the outstanding matters.

As you will see we are critical of the hydrology and flooding material that has been provided. In our opinion it falls well short of the standard technical documentation that is typically provided for major infrastructure projects where there are concerns about potential flooding and environmental impacts related to water flows.

Consequently should the Minister determine to grant consent, special attention will need to be given to the consent conditions, due to the inadequacy of the material provided to date. These conditions should ensure that further technical investigations are undertaken and documented and provided for review before the design is completed. In this regard we have been liaising with the Department and have separately provided commentary on various draft conditions relating to hydrology and flooding impacts.

Documents Reviewed

Various documents have been provided for review. Of those documents the following are most relevant:

- i. *State Significant Infrastructure Application Supporting Document*, January 2016, prepared by GHD for ARTC;
- ii. *Secretary's Environmental Assessment Requirements (SEARs)*, 8 November 2016;
- iii. *Environmental Impact Statement (EIS)*, Main Report (undated);
- iv. *EIS Technical Report 6 – Hydrology and Flooding Assessment* dated October 2017 prepared by GHD for ARTC. This report is subsequently referred to as **TR6**;
- v. an early version of the Submissions Report, dated November 2017, in addition to ARTC's responses to a list of issues that the Department had forwarded to ARTC; and
- vi. *Submissions Report*, dated February 2018. This included *Appendix G – Hydrology Design Process*, dated February 2018.

Activities Undertaken During the Review

In addition to a review of the documentation referred to above, the reviewer also undertook:

- (a) various meetings and email correspondence with the Department;
- (b) meeting with GHD staff including flood modellers on 3 November 2017 (with ARTC and DPE present by phone);
- (c) a two day site inspection of the route and adjacent waterways between Peak Hill and Narromine on 4-5 November 2017;
- (d) review of various spreadsheet computer files prepared by GHD during their assessment of the hydrology and flooding issues that are documented in Technical Report 6 of the EIS. These files were provided on 2 November 2017 via ARTC;
- (e) telephone discussions and email correspondence between the reviewer and Dr Bill Weeks. It is understood Dr Weeks was engaged by ARTC and he became the reviewer's primary contact for technical matters relating to the project as GHD, who were the authors of TR6, were no longer available to assist with the review after the November 2017 meeting noted in (b) above; and
- (f) meeting between ARTC and the Department held on 22 January 2018 which was also attended by Dr Weeks and the reviewer.

REVIEW COMMENTS

The following provides the reviewer's assessment of the key hydrological and flooding issues associated with the Project including those for which some matters remain outstanding.

1. Inadequate Information for Impact Assessment

- 1.1. The flood behaviour on the upstream and downstream sides of the rail formation is controlled primarily by:
 - (a) The size and location of the proposed culverts. These control the location and magnitude of flows which pass through the rail formation;

- (b) The height of the rail line and its formation. These control the location and magnitude of flows which overtop the rail formation in large or extreme flood events.
- 1.2. The appendices contained within the rear of TR6 provided details of these culvert and rail heights. TR6 also provided an assessment of the flood level changes associated with these culvert and rail details, and the extent of overtopping of the formation for various design floods.
- 1.3. These details of the culverts and rail heights were preliminary. In an email to the Department on 2 November 2017 ARTC explained that *“the flooding impacts reported in the EIS are based on preliminary hydrological modelling that was undertaken in advance of obtaining detailed survey of the rail corridor and ground levels upstream and downstream of the project”*.
- 1.4. During the course of the EIS process, after commencement of the detailed design and the receipt of various submissions and comments, it is understood that the culvert and rail details presented in TR6 have been changed or are currently being changed. Consequently the resultant flood behaviour upstream and downstream will also change.
- 1.5. The reviewer is currently unaware of the proposed rail heights and culvert details as an update of the information in TR6 has not been provided. Further the results of any revised flood modelling based on this updated information have also not been provided.

2. Increased Culvert Sizes and Resultant Impacts Downstream

- 2.1. Section 5.2.2 of the Submissions Report states that no assessment of the downstream flood conditions was undertaken for the EIS. Further no assessment has been presented in the Submissions Report.
- 2.2. Section 5.2.2 also states that the EIS assumed that there would be a ‘like for like’ replacement of the culverts. The reviewer disagrees with this noting that the appendices to TR6 indicated that large increases in the existing culverts were proposed. These increases would likely lead to a doubling or trebling of the flows passing through the formation in the culverts.
- 2.3. As the rail corridor is typically only about 30m wide, concerns have been raised that there is insufficient space available to locate the necessary mitigation measures between the culvert outlets and the edge of the corridor. The increased flows would likely lead to increased erosion and may have adverse geomorphological impacts on downstream private properties.
- 2.4. The Submissions Report noted these concerns and reaffirmed ARTC’s commitment to address these issues during detailed design. Nevertheless no technical details of the mitigation proposals were provided. Therefore in the opinion of the reviewer, insufficient information has been provided to be fully confident that potentially adverse impacts won’t occur without widening of the corridor (or other measures such as compensation to downstream landholders).
- 2.5. The reviewer also remains concerned that the Submissions Report does not address (or correct) various statements in the EIS or TR6 which suggest that it will be difficult or impossible to mitigate the potential erosion and geomorphological impacts within the existing rail corridor. These statements include, for example:
 - (a) *“Watercourses located downstream of many existing culverts exhibit signs of erosion. This is inferred as being the result of progressive stream instability due to the increased watercourse flow velocity, the historical increased frequency of flow and the lengthening of the periods of saturation as compared to that prior to construction of the existing rail corridor. At most locations, the length of the watercourse instability does not exceed about 50 metres. However, there are*

*some localised areas where the effects extend further downstream of the individual structures”;*¹

- (b) *“The assessment has indicated a potential residual erosion risk at about 12 culvert locations (of 145 culverts assessed) for a distance of about 100 metres from the extent of the rock protection and after that distance, the risk is predicted to become minimal”;*²
- (c) *“A number of watercourses downstream of the rail corridor currently show signs of erosion and scouring ...”;*³
- (d) *Initial modelling indicates that for the one per cent AEP event about 50 per cent of the culverts within the proposal are expected to have flow velocities (within the culvert structure) less than approximately 2.5 m/s, and 75 per cent less than 3.5 m/s”.*⁴ That is, in 25% of culverts the velocities could be greater than 3.5 m/s. This is a very large velocity and would be associated with very serious erosion risks;
- (e) *“A small number of culverts are estimated to have maximum flow velocities (within the culvert structure) greater than 5 m/s”.*⁴ Note that 5 m/s is a huge velocity and in the opinion of the reviewer is unlikely to be calculated correctly. Nevertheless it remains of concern. Such a velocity would be associated with very serious erosion risks;
- (f) *“However, there remains a risk of further erosion of the watercourses downstream of each new culvert because of increased flow rates, volumes and velocities during flood events”.*⁴

3. Flood Immunity

- 3.1. The flood immunity of the project in the TR6 was stated to be 1% AEP.
- 3.2. This has now changed and as explained in Appendix G, where the existing rail has a flood immunity less than 1% AEP, a decision will be made on maintaining the existing flood immunity or upgrading the rail to provide a higher standard, based on a multi-criteria analysis (MCA).
- 3.3. Appendix G states *“this will result in either a 1% AEP design flood immunity or a lower flood level if this can be justified by the risk assessment and MCA. This analysis is still underway”.*
- 3.4. Whilst this process will define the flood immunity for individual sections of the Parkes to Narromine route, clearly the overall route can have immunity no higher than the lowest immunity of any individual section. As the process is still underway, it is not known what the flood immunity of the project will be.
- 3.5. The NSW Floodplain Development Manual sets out the process by which the flood immunity standard should be selected. The process requires the Proponent to evaluate the socio-economic, technical, flood risk and environmental implications of adopting different immunity standards. The process which is currently underway and described in Appendix G may be consistent with the Manual. Nevertheless as it has not been completed it is not possible to assess it further.
- 3.6. The normal practice for major infrastructure projects is for the flood immunity standard to be established prior to commencement of the EIS and not during detailed design.

¹ Pg 62, Section 4.3.4 of TR6

² Pg 76, Section 6.2.2 of TR6

³ Pg 95, Section 6.3.4 of TR6

⁴ Pg 96, Section 6.3.4 of TR6

4. Spoil Mounds

- 4.1. The impact of spoil mounds on flood behaviour has not yet been addressed. Further the reviewer understands most or all of these will be permanent structures and “... *it is likely that there would be spoil mounds along the majority of the length of the proposal*”.⁵
- 4.2. Without details of the proposed location and lateral extent of the spoil mounds, and the proposed size and location of culverts, and the proposed overtopping location of the rail corridor, it is not possible to assess the flood impacts of the spoil mounds. ARTC have deferred this assessment until detailed design.

5. Quantitative Design Limits for Flooding Impacts

- 5.1. There were no quantitative design limits relating to flood impacts provided in the EIS. These limits are important because they define the maximum acceptable changes in relevant flood parameters such as velocity, duration, water levels, etc. In the opinion of the reviewer, the absence of quantitative design limits was a serious shortcoming of the EIS.
- 5.2. Because these limits may be used as a trigger for design modifications, acquisition of additional corridor land, payment of compensation, etc, the limits need to be carefully formulated, justified and documented.
- 5.3. Design criteria have now been formulated and are presented in Appendix G of the Submissions Report. The reviewer’s comments on these are as follows:
 - (a) the principal flood criteria relate to flood level, flow velocity and inundation duration;
 - (b) the flood(s) in which the criteria are to be applied are not specified. This is a significant oversight;
 - (c) the justification of the criteria is not provided;
 - (d) Appendix G notes that the afflux criteria may be changed locally. This is unlikely to be appropriate and in the opinion of the reviewer, is not recommended without further justification;
 - (e) it is unlikely that any increase in flood levels when above floor level inundation of residential or commercial buildings is occurring, or is about to occur, can be justified.

6. Summary and Conclusions

- 6.1. A number of deficiencies and concerns with the hydrology and flooding assessment presented in the EIS were identified after it was released. The main items are discussed in sections 1 to 5 above.
- 6.2. Whilst these matters have been raised with ARTC and their consultants as part of the appraisal of the EIS, in the main these matters have not been addressed directly in the Submissions Report. Instead ARTC have proposed that they be deferred to a later stage of the project.

⁵ Pg 78, Section 6.2.8 of TR6

- 6.3. In the opinion of the reviewer this is not a preferred approach as there is reduced confidence that the matters can be properly addressed when they are deferred in the manner proposed by ARTC.
- 6.4. Nevertheless if the Minister is of a mind to grant consent then very carefully worded conditions will need to be prepared. These conditions could require the Proponent to provide the important missing information prior to completion of the detailed design. (The reviewer has provided commentary of some suitable conditions under separate cover for this purpose).

Yours sincerely

A handwritten signature in blue ink, reading "Drew Bewsher". The signature is fluid and cursive, with the first name "Drew" and last name "Bewsher" clearly legible.

Drew Bewsher
Director