INLAND RAIL

Executive Summary

North Star to NSW/Queensland Border

Environmental Impact Statement

ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

IR_1535

COVER IMAGE
A visualisation created by ARTC of the proposed alignment crossing the Macintyre River, looking north from NSW towards Queensland.

Visualisations are for illustrative purposes and not to scale. Please note, the reference design may change as a result of further investigations, government approvals or during detailed design.

ACKNOWLEDGEMENT OF COUNTRY

Inland Rail acknowledges the Traditional Custodians of the land on which we work and pay our respect to their Elders past, present and emerging.

SEARs Compliance

Submission of environmental impact statement

Prepared under Part 5.2 of the Environmental Planning and Assessment Act 1979 (NSW). Environmental impact statement prepared by:

Name	Ron Dela Pena—NS2B EIS Manager
Address	Future Freight Joint Venture Level 8, 540 Wickham Street, Fortitude Valley QLD 4006
Responsible person name and address (proponent)	Rob McNamara Project Director, Inland Rail, Australian Rail Track Corporation Level 16, 180 Ann Street, Brisbane Qld 4000
The address of the land to which the statement relates	Land within the Gwydir and Moree Plains local government areas as described within this environmental impact statement.
Description of the infrastructure to which this statement relates	Construction and operation of a section of Inland Rail, located between North Star in NSW and the NSW/Queensland Border.
Environmental impact statement	An environmental impact statement is attached addressing the relevant sections of Part 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) and Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (NSW).

DECLARATION

I certify that the FFJV has prepared the environmental impact statement and it is deemed satisfactory to meet the SEARs (03/03/20) at the time of submission for adequacy review by DPIE. The environmental impact statement contains information obtained through investigation and analysis completed in accordance with standard industry practice, publicly available, proponent supplied and third party information obtained by agreement that is relevant to the environmental assessment of the infrastructure to which the statement relates. To the best of FFJV knowledge, the information contained in the environmental impact statement is neither false nor misleading.

SIGNATURE R. dela Peña

NAME Ron Dela Pena – NS2B EIS Manager

DATE 17 August 2020

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

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Executive summary

The Australian Rail Track Corporation Ltd (ARTC) is seeking approval to construct and operate the North Star to NSW/Queensland Border section of Inland Rail (the proposal) under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

An environmental impact statement (EIS) has been prepared for the proposal. The EIS describes how the proposal will be constructed and operated. It also assesses environmental impacts that could occur as a result of the proposal.

Overview of Inland Rail

The Australian Government has committed to delivering the Inland Rail Program, a significant piece of national transport infrastructure that will improve Australia's existing rail network and serve the interstate freight market. The Inland Rail route is approximately 1,700 km long and will provide a direct link between Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland.

The Inland Rail route uses the existing interstate rail line from Tottenham to Illabo. A combination of new and upgraded rail line will be used via Parkes, Moree, Toowoomba and Calvert to reach the existing interstate rail line at Kagaru, and onto Acacia Ridge and Bromelton, south of Brisbane.

Inland Rail is divided into 13 projects, seven of which are located in NSW. Each project will undergo environmental assessment and approval under relevant local, State and Commonwealth planning laws, taking into account the contribution of each project to the wider Inland Rail Program.

In 2015, ARTC developed a ten-year program to deliver all 13 Inland Rail projects by 2025. ARTC was created in 1997 after the Australian Government and state governments agreed to the formation of a 'one stop shop' for all operators seeking access to the national interstate rail network. Across its network, ARTC is responsible for:

- Selling access to train operators
- Developing new business
- Capital investment in the corridors
- Managing the network
- Infrastructure maintenance.

Overview of the proposal

The North Star to NSW/Queensland Border Inland Rail proposal is shown in Figure 1. The proposal is one of three 'missing link' Inland Rail projects in NSW.

Location

From a point approximately 900 m north of North Star, the proposal follows the existing, non-operational Boggabilla rail corridor for approximately 25 km towards Whalan Creek. The proposal continues along a 5 km section of greenfield rail corridor towards the NSW/QLD border. The NSW/QLD border is defined by the centre point of the Macintyre River.

The rail corridor for the proposal will have a general width of 40 m with some variation to cater for local topography and certain pieces of infrastructure. The rail corridor will be of sufficient width to encompass all infrastructure currently proposed for construction, as well as possible expansions in the future.

Key features

The proposal consists of the following key features:

- 25 km of new track within the existing, non-operational Boggabilla rail corridor
- Approximately 5 km of new track within a greenfield rail corridor
- One crossing loop
  - Designed to accommodate trains up to 1,800 m long
- Eleven new bridges
  - Including an approximately 1.8 km long viaduct over the Macintyre River and Whalan Creek, which are major watercourses. The viaduct is located in both NSW and Queensland; therefore, it will be assessed under the NSW *Environmental Planning and Assessment Act 1979* by this EIS, and under the Queensland *State Development and Public Works Organisation Act 1971* by the Inland Rail—Border to Gowrie EIS
- Work on new and existing level crossings
- Earthworks, drainage works and road works
- Work on new and existing level crossings
- Ancillary infrastructure including signalling and communications infrastructure, signage, fencing and utilities.

Timing and operation

Subject to approval of the proposal, construction of the proposal is planned to occur between 2021 and 2025. The proposal will be managed and maintained by the Proponent; however, train services will be provided by a variety of operators.

Train services are not expected to start until all 13 sections of the Inland Rail Program are complete, which is planned for 2025.

The proposal will be trafficked by an estimated 14 trains per day in 2025, increasing to an estimated 21 trains per day in 2040. Annual freight tonnages will increase in parallel, from approximately 12 million tonnes per year in 2025 to 20 million tonnes per year in 2040.

The proposal is designed to support 21—25 tonne axle load intermodal (i.e. container) trains up to 1,800 m long and 6.5 m high. Depending on the tonne axle load, train speeds will vary between 80 km per hour (km/hr) and 115 km/hr. In addition, the proposal footprint is future proofed to accommodate 30-tonne axle load intermodal trains up to 3,600 m long and 6.5 m high, travelling at 80 km/hr.

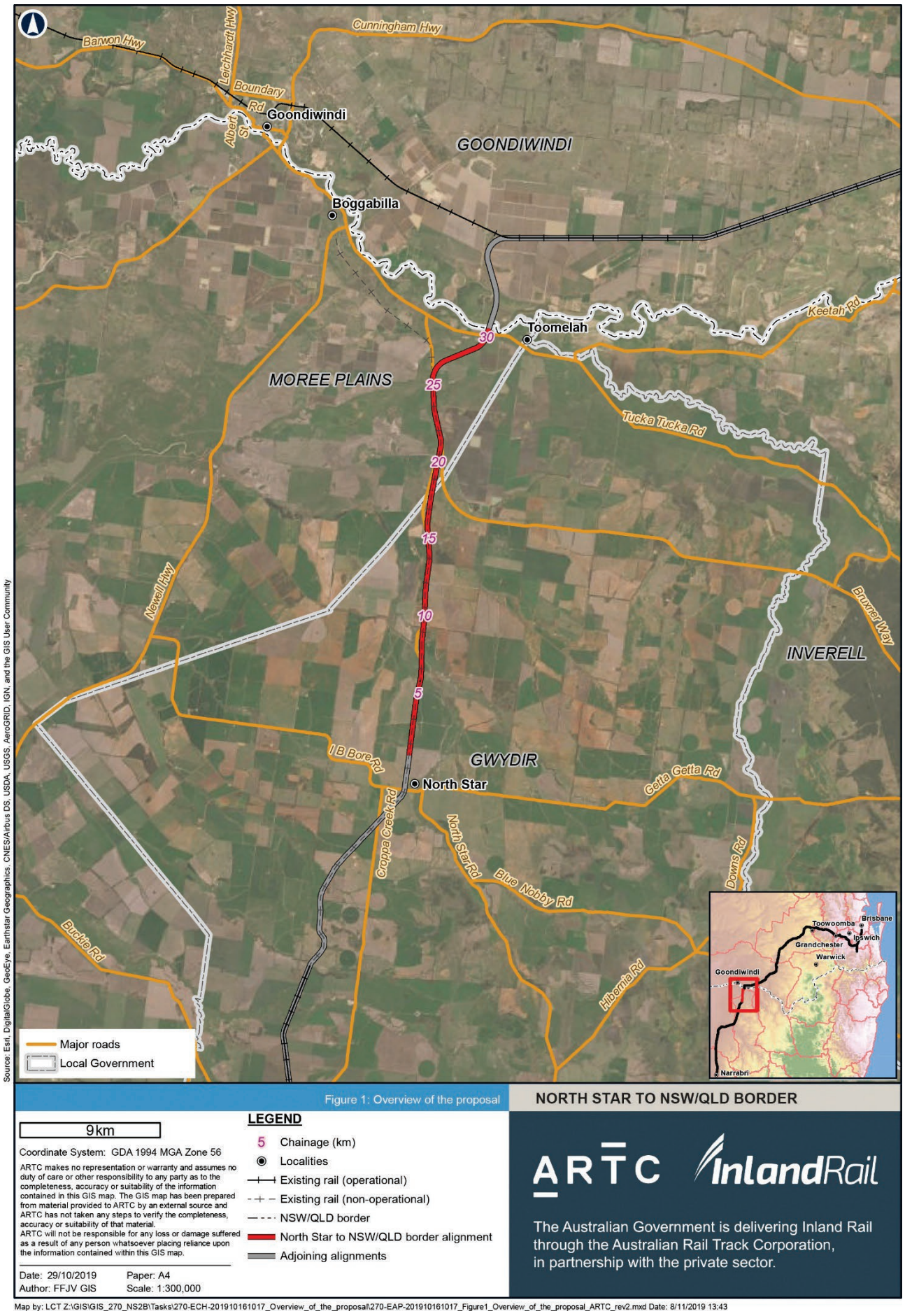

FIGURE 1: OVERVIEW OF THE PROPOSAL

Need for Inland Rail

At present, there is no continuous inland rail link between Melbourne and Brisbane. Interstate rail freight travels between Melbourne and Sydney via Albury, and between Sydney and Brisbane, generally along the coast. About 70 per cent of freight between Melbourne and Brisbane is via road, mainly via the Newell Highway in NSW, and connecting highways in Victoria and Queensland (Transport for NSW, 2015).

The idea for providing an inland railway between Melbourne and Brisbane has been around for at least one hundred years (Inland Rail Implementation Group, 2015). Since 2006, the concept of establishing an inland railway between Melbourne and Brisbane has been the subject of significant analysis due to growing freight demand, and existing freight capacity and infrastructure issues.

Growth in freight demand

The Melbourne to Brisbane corridor is one of the most important general freight routes in Australia, supporting key population and employment precincts along the east coast and inland NSW. It is estimated that 21 million tonnes of non-bulk and complementary freight moves along this corridor each year. This is expected to grow to over 40 million tonnes per year by 2050.

With the population of the eastern states forecast to increase by 60 per cent over the next 40 years, the need for efficient and effective freight transport will continue to increase. Strong forecast population growth, accompanied by comparable growth in employment, is likely to place significant pressure on existing infrastructure and utilities.

Existing freight capacity and infrastructure issues

Without the increased use of rail, the growth in freight demand is likely to result in increasing pressure on the road network and associated safety and environmental issues, increased freight costs, and a loss of economic opportunity. The current national infrastructure network cannot support this projected growth, with increasing pressure on already congested roads through Sydney, and increasing use of heavy trucks such as B-doubles and B-triples along the Hume–Pacific and Newell highway corridors.

Rail is generally the most productive and efficient mode for freight travelling from regional areas to export ports and urban destinations. Freight trains travelling along the Melbourne to Brisbane corridor currently travel through the Sydney metropolitan rail network, often experiencing significant delays. Travel-time reliability is poor as a result of the priority given to passenger services, freight transit curfews in the Sydney metropolitan area, and substandard rail alignments elsewhere. Limited capacity during morning and afternoon passenger peaks restricts freight movements at these times.

Benefits of Inland Rail

Inland Rail will result in the following local, regional, State and national benefits:

- **Boost the Australian economy**—Inland Rail is expected to increase Australia's gross domestic product by $16 billion during its construction and the first 50 years of operation.
- **Create jobs**—it is estimated that construction of Inland Rail will require a workforce of up to 16,000 people at the peak of construction, and an average of 700 additional jobs per year over the construction period.
- **Improve connections within the national freight network**—Inland Rail will enhance the National Land Transport Network by creating a rail linkage between Melbourne and Brisbane, providing a connection between Queensland and the southern and western states, and a connection to the east–west trans-continental line (at Parkes).
- **Provide better access to and from regional markets**—Inland Rail will make it easier for freight to move from farms, mines and ports to national and overseas markets.
- **Reduce costs**—it is estimated that rail costs for inter-capital freight travelling between Melbourne and Brisbane will be reduced by $10 per tonne. Highway maintenance costs will also be reduced.
- **Offer better transit time and reliability**—Inland Rail will allow a transit time of less than 24 hours between Melbourne and Brisbane and a reliability of 98 per cent—matching current road levels.
- **Increase the capacity of the transport network**—Inland Rail will increase the capacity for freight and passenger services by reducing congestion along the busy coastal transport route, and allow for growth in passenger services, particularly in the Sydney region.

- **Reduce distances travelled**—with Inland Rail, the rail distance between Melbourne and Brisbane will reduce by 200 kilometres, and the distance between Brisbane and Perth, and Brisbane and Adelaide will reduce by 500 kilometres.
- **Improve road safety**—it is estimated that each year, there will be up to 15 fewer serious crashes, avoiding fatalities and serious injuries.
- **Improve sustainability**—carbon emissions will reduce by 750,000 tonnes per year of operation.
- **Improve community amenity**—truck volumes and road congestion on some of Australia's busiest highways will reduce, which will also mean a reduction in trucks travelling through more than 20 regional towns. This will lead to a corresponding reduction in amenity impacts associated with the movement of freight by road, including noise and air emissions.
- **Provide an alternative north–south freight link**—Inland Rail will provide a second link between Queensland and the southern states, making Australia's national freight rail networks less vulnerable to disruptions, for example from extreme weather events.

Because the proposal is one of three 'missing link' projects in NSW, Inland Rail cannot proceed without it. This would mean that the benefits of Inland Rail would not be realised.

Approach to environmental management

Detailed environmental management plans for construction and operation, as well as relevant sub-plans will be prepared by the Contractor and approved by relevant state agencies. The detailed Construction Environmental Management Plan and an Operational Environmental Management Plan will include, but not be limited to, the mitigation measures identified in Chapter 27: Environmental Management Plan and any conditions of approval.

Chapter 27: Environmental Management Plan outlines the strategies to be adopted to address the identified impacts and recommendations in the EIS. Its purpose is to set out the proposal commitments to environmental management, including the identifying environmental aspects to be managed and how environmental values would be protected and enhanced. The Environmental Management Plan also identifies mitigation measures relevant to the reference design for the proposal.

Once in place, the construction environmental management plans and the operational environmental management plan would be dynamic documents. Each plan will be revised to incorporate further information and public concerns, approval conditions, changes in environmental management procedures, new techniques, and relevant legislative requirements.

The Construction Environmental Management Plan must be endorsed by ARTC and then submitted to the Secretary of the Department of Planning, Industry and Environment for approval no later than one month before the start of any works, including early works and demolition. The Operational Environmental Management Plan will be finalised 10 days before the start of operations and will be communicated to relevant site personnel.

Key findings of the Environmental Impact Statement

The proposal has been designed to minimise environmental impacts, wherever possible. However, some potential impacts cannot be avoided. These impacts are described in the following sections.

A range of impact mitigation and management measures will be implemented during the construction and operation phases. These measures will facilitate compliance with relevant legislation and any conditions of approval imposed on the proposal.

Biodiversity

Native vegetation within the study area has been extensively modified as a result of agricultural and pastoral land use activities, with the overwhelming majority cleared for grazing and/or cropping. Existing vegetation predominantly consists of exotic grassland with scattered paddock trees.

Despite being extensively modified, the proposal area provides suitable habitat for several Threatened Ecological Communities and conservation significant species listed under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), *Biodiversity Conservation Act 2016* (NSW) and *Fisheries Management Act 1994* (NSW).

The proposal area and surrounding areas contain other terrestrial ecological values including habitat connectivity, wetlands and waterways.

One hundred and thirty-six ecological receptors were identified within the study area for the purposes of the flora and fauna assessment. These receptors varied from broad-scale receptors such as landscape features, down to finer species-scale receptors, including Threatened Ecological Communities, and habitat for conservation- significant species and migratory species. These receptors range between high, moderate and low sensitivity categories based on factors including conservation status, exposure to threatening processes, resilience and representation in the broader landscape.

Several groundwater-dependent ecosystems, dependent on either the surface or subsurface expression of groundwater, are considered to occur within the study area and riparian corridors within the study area allow east–west movement opportunities for fauna.

Vegetation corridors along North Star Road and Bruxner Way allow north–south movement opportunities for fauna within the study area. Existing vegetation along North Star Road and Bruxner Highway is fragmented and provides very limited landscape connectivity for fauna. In contrast, biodiversity corridors associated with riparian vegetation along drainage lines provide landscape connectivity for fauna.

The construction and operational phases of the proposal has the potential to impact on ecological receptors through the following potential impacts:

- Habitat loss and degradation from vegetation clearing/removal
- Fauna species injury or mortality
- Reduction in biological viability of soil to support growth due to soil compaction
- Displacement of flora and fauna species from invasion of weed and pest species
- Reduction in the connectivity of biodiversity corridors
- Edge effects
- Habitat fragmentation
- Barrier effects
- Noise, dust, and light
- Increase in litter (waste)
- Aquatic habitat degradation
- Erosion and sedimentation
- Disturbance to specialists breeding and foraging habitat
- Trampling of threatened species
- Fallen timber and bush rock collection or removal
- Fertiliser drift
- Increased fire risk.

Terrestrial and aquatic ecological receptors will be avoided, where practical and potential impacts will be minimised and mitigated to the greatest extent practical. Mitigation measures include:

- Refining the construction footprint and continuing to develop the design to minimise the extent of impacts to waterways, riparian vegetation and in-stream flora and habitats
- Developing and implementing a Biodiversity Management Sub-plan and Biosecurity Management Sub-plan as part of the Construction Environmental Management Plan
- Methods and sequencing of pre-clearance fauna surveys and threatened plant surveys, including terrestrial, aquatic habitats and breeding habitats (including burrows and hollow bearing trees/logs, existing culverts and structures).

During detailed design, sensitive ecological features identified in the EIS will be subject to further investigation to more accurately determine the magnitude of the significant adverse impacts on the identified ecological receptors. The specific mitigation measures will then be applied to ensure that the significance ratings of any potential impacts are classified as low as reasonably practical and more significant adverse impacts are offset.

There is the potential for some proposal activities to have a cumulative, irreversible, or permanent impact on some ecological receptors, even after the implementation of all mitigation measures. In these cases, the compensation for the residual impact will occur.

Heritage

A total of 54 Aboriginal archaeological sites, comprising 36 open artefact sites (i.e. artefact scatters and isolated artefacts) and 18 culturally modified trees were identified within or adjacent to the proposal area. These included:

- Three sites previously recorded on the NSW Environment and Heritage's Aboriginal Heritage Information Management System (AHIMS) (AHIMS#: 2-4-0046, 2-4-0047, 2-4-003)
- 51 new sites recorded by Future Freight Joint Venture (FFJV), the consultants engaged to undertake the cultural heritage assessment.

In addition to archaeological resources, Registered Aboriginal Party field representatives identified 16 plant resources that are traditionally used by past and current Aboriginal People as bush foods and medicines. The plant resources of the Border Rivers and Gywdir Catchments areas have also been extensively documented in a book published by the Border Rivers–Gwydir Catchment Management Authority.

In addition to the analysis of historical mapping, a search of heritage registers identified 17 places of historical heritage values. Each of these sites was inspected and an assessment of heritage significance undertaken, finding 13 sites are of local heritage significance.

An examination of the sites related directly to the proposal's impacts identified 22 artefact scatters, 12 isolated artefacts and nine culturally modified trees will be directly impacted by the proposal and seven culturally modified trees will be indirectly impacted. Of the 17 identified historical heritage sites, 12 will be directly impacted by the proposal. These include two railway sidings, two bridges and four fettler camps.

The accepted methodology for managing impacts on heritage places is to avoid them wherever possible, minimise impacts as far as is practical and mitigate impacts where avoidance and minimisation is not possible (ICOMOS, 2011). Measures to achieve these aims include, but are not limited to:

- Consider options to alter the disturbance footprint and avoid direct or indirect impacts
- Tailor construction methodology to limit noise, vibration and dust impacts
- Implement protocols for responding to unexpected heritage finds
- If impacts cannot be managed in any other way, consider of it is appropriate to relocate buildings or items of moveable heritage to another location, such as a local historical society
- Undertake archaeological survey to map all elements of complex sites, and identify areas of possible sub-surface deposit
- Collect archaeological artefacts on the surface of the ground.

Surface water and hydrology

The proposed alignment is located within the NSW Border Rivers Catchment. It intersects four ephemeral creeks—Whalan Creek, Forest Creek, Back Creek and Mobbindry Creek—and the perennial Macintyre River, the centre point of which defines the NSW/QLD border.

Land use within the NSW Border Rivers Catchment is dominated by grazing and dryland cropping. Therefore, water is primarily used for stock watering, irrigation, drinking water and household use. The Borders Rivers Catchment has experienced many flood events, notably in 1956, 1976, 1996 and 2011. Landholders are reliant on the flooding characteristics of the NSW Border Rivers Catchment for collecting and storing water for irrigation.

The main potential impacts to surface water and hydrology as a result of the proposal are:

- Increased surface water turbidity and sedimentation due to:
  - Vegetation clearing, topsoil stripping, excavations and earthworks, which may increase the erodibility of exposed soils
  - Erosion of material stockpiles
  - Road and track maintenance
- Changes to surface water chemistry due to:
  - Accidental chemical or fuel spills
  - Disturbance of saline or contaminated soils, which may increase the salinity of runoff
  - Dissolution of ballast material
  - Road and track maintenance

- Changes to the existing flood regime, such as:
  - Changes in peak water levels and associated areas of inundation
  - Concentration of flows
  - Redirection of flows or changes to flood flow patterns
  - Increased velocities leading to localised scour and erosion
  - Changes to duration of inundation or increased depth of water affecting trafficability of roads and tracks
- Changes affecting the existing fluvial geomorphologic conditions of waterways due to changes in peak water levels, flood distribution and/or velocities.

Standard ARTC impact mitigation measures relevant to surface water quality were assessed to be sufficient for mitigating impacts that could increase water turbidity and sedimentation. Similarly, for changes to water quality related to changes in flow and drainage paths, mitigation measures have been assessed to be sufficient.

A natural filtration system for treatment of stormwater runoff from the rail formation is an additional operation mitigation required to address the potential impacts to water chemistry from the rail formation during operation. This system includes the use of vegetated embankments (grassed) and vegetated longitudinal drains where long drainage is required.

A range of measures will be implemented during the construction and operation phases to mitigate potential impacts to surface water and hydrology as a result of the proposal. Measures associated with surface water impacts include:

- Developing and implementing the following plans: erosion and sediment control plan, reinstatement and rehabilitation plan, soil management sub-plan, and stormwater management sub-plan
- Hydraulic modelling and analysis to ensure that mitigation measures are appropriately sized
- Minimising the proposal's temporary construction footprint, while still allowing sufficient room for erosion and sediment control measures
- Construction will be designed and staged to minimise vegetation clearing and the area of exposed soil
- A surface water monitoring program will be developed for the proposal, ensuring compliance with the relevant water quality objectives
- Vegetated embankments and vegetated longitudinal drains, where required.

A hydrology and flooding assessment has been completed and addresses the potential impacts on flooding, hydrology and geomorphology. Design event hydrology was developed using *Australian Rainfall and Runoff: A Guide to Flood Estimation* (Geoscience Australia, 2019) flood flow estimations. A hydraulic sub-model was developed covering the floodplain area and extending approximately 18 km downstream of Goondiwindi—as per the outcomes of stakeholder feedback. The hydraulic sub-model was run for a suite of design events ranging from the 20 per cent annual exceedance probability event to the probable maximum flood event. A comparison of Existing Case and Developed Case, which incorporated the proposed works into the hydraulic model, allowed for assessment of the proposed works on the flood impact objectives.

The probability of in-stream works impacting surface water or hydrology is considered low. The hydrologic and flooding assessment demonstrates that the proposal is predicted to result in impacts on the existing flooding regime that generally comply with the flood impact objectives. Best practice flood risk management, including sensitivity testing, has been applied in developing the proposal design to minimise risk to life, property, infrastructure, the community and the environment.

Existing fluvial geomorphological aspects of targeted waterways was completed for six locations in the key existing waterways in accordance with the *Australian River Assessment System Physical Assessment Protocol* (Parsons, Thoms & Norris, 2002). Significant impact to these waterways is not considered likely based on the results of the hydrology and flooding assessment, which showed minimal to minor impacts on peak water levels, flood distribution and/or velocities.

Mitigation measures associated with flooding impacts and geomorphology include:

- The proposal has been designed to achieve a 1 per cent Annual Exceedance Probability[1] flood immunity, while minimising unacceptable impacts on the existing flooding and drainage regime
- Using the existing, non-operational Boggabilla rail corridor to avoid situating more linear infrastructure on the floodplain
- Designing and locating bridge and culvert structures to:
  - Maintain existing surface water flow paths and flood flow distributions
  - Avoid unacceptable increases in peak water levels, flow distribution, velocities and duration of inundation
- Identifying sensitive receptors, e.g. homesteads
- Engaging with stakeholders to communicate and seek feedback on proposed design outcomes in terms of flooding
- Installing scour and erosion protection measures in areas determined to be at risk
- Ensuring designated drainage areas will be free flowing during construction works.

Groundwater

The groundwater regime in the proposal area is comprised of two main aquifer systems:

- Cenozoic alluvium deposits associated with the Border Rivers alluvium and other drainage systems that the proposal intersects (e.g. Macintyre River, Whalan Creek and Mobbindry Creek)
- Jurassic to Cretaceous sedimentary rocks of the Surat Basin, which form part of the Great Artesian Basin.

The uppermost aquifer system (Cenozoic alluvium) has the potential to be impacted by certain construction activities and infrastructure types. For instance:

- Clearing and grading could reduce evapotranspiration, potentially increasing groundwater levels
- Soil compaction and altering areas where surface water ponding occurs naturally may reduce groundwater recharge rates
- Bridge pilling may lower aquifer permeability, alter groundwater flow patterns (e.g. mounding) and reduce groundwater volumes due to the extraction of wet soil/rock during piling
- Embankments may reduce the permeability of underlying soils, potentially affecting the flow of shallow groundwater resources beneath, and adjacent to, the embankment
- Contamination of groundwater resources may occur as a result of accidental spills and leaks of chemicals, fuel, washdown water, and wastewater from the construction camp.

Overall, the probability of construction activities and infrastructure types impacting on shallow groundwater resources is considered low. This is because the area to be cleared and graded is relatively small; the diameter, spacing and installation technique of bridge piles is not expected to cause groundwater mounding or a significant reduction in groundwater volumes due to dewatering; the depth of cuts and borrow pit excavations are not likely to intersect groundwater; and the ability of contaminants to infiltrate shallow aquifers will be limited due to the low permeability of clayey soils present in the upper two metres of the soil profile across much of the proposal site.

Within the proposal site, groundwater is currently used for irrigation, stock watering, general farm purposes and drinking water (from several registered bores near the Toomelah community). Drawing on groundwater resources to supply water during construction may result in short-term, localised impacts on existing users of groundwater. However, no significant long-term impacts on groundwater volumes, groundwater quality or existing groundwater uses are anticipated.

1. The Annual Exceedance Probability (AEP) is the chance of a flood if a nominated size occurring in a particular year. The chance of the flood occurring is expressed as a percentage and, for large floods, is generally the reciprocal of the Average Recurrence Interval (ARI). For example, the 1 per cent AEP flood event is equivalent to the 100-year ARI flood event.

The following measures will be implemented to mitigate potential impacts on groundwater during construction and operation of the proposal:

- If dewatering of shallow groundwater is required for bridge piling, the dewatering duration will be minimised. If extended periods of dewatering are required, a groundwater management plan may be required
- A range of construction water sources will be investigated to minimise reliance on groundwater resources
- Embankments have been designed to minimise compaction of alluvial sediments
- A groundwater monitoring framework has been developed for the proposal. The final monitoring criteria will be based on baseline groundwater monitoring, modelling and analysis, and any relevant conditions of approval
- The Construction Environmental Management Plan will include measures to prevent groundwater contamination, including spill kits on all vehicles and training personnel in managing contamination.

Land resources

The land resources assessment evaluated the existing environment, identified and assessed the potential risks arising from the disturbance and excavation of land, as well as the reuse or disposal of soil. A risk assessment of soil properties, including agricultural and problematic soils, and contaminated land was undertaken from a construction, operational and decommissioning perspective. Following the risk assessment, appropriate mitigation measures to be implemented during these three phases were recommended.

The assessment of land resources aspects identified the following activities to potentially have adverse impacts on the rail corridor during each of the construction, operational and decommissioning phases of the proposal:

- Activities have the potential to disturb existing contaminated soil or groundwater, which may contaminate previously unaffected soil or groundwater and affect human health. Sources of existing contaminated soil near the proposed alignment include agricultural land and the existing, non-operational Boggabilla rail corridor
- Construction is likely to result in the loss of natural soil resources, including Biophysical Strategic Agricultural Land. Over time, this may cause soil structure and fertility to decline
- Potential to alter the landform and topography of the local area—for example, rail embankments may impede floodwaters, potentially redirecting flood waters to sensitive receptors
- Excavations can lead to soil inversion and exposure of potential acid sulfate soils. The inversion of alkaline subsoils can lead to increased salinity or sodicity issues, groundwater contamination and soil fertility decline, while acid sulfate soils can create damaging levels of sulfuric acid
- Construction and decommissioning activities could potentially introduce invasive flora and fauna into the area through additional traffic going onto and offsite.

Many potential impacts to land resources and contamination through proposal activities were found to have low residual risk on implementation of initial mitigation measures, during the design phase, and additional mitigation measures implemented during the detailed design to decommissioning phases. Change to landform and topography during the construction phase of the proposal was the only residual medium risk.

Mitigation measures detailed within Chapter 15: Land Resources and Contamination will sufficiently manage all identified potential impacts for land resources resulting from proposal activities.

Noise and vibration

Construction noise and vibration

The construction noise and vibration assessment considered reasonable, worst-case scenarios related to site establishment, earthworks, structures, drainage, rail civil works and road civil works. Some construction activities are likely to occur outside recommended standard hours; therefore, the assessment considered potential impacts during standard and non-standard working hours. The assessment also considered potential impacts during the operation phase due to the construction camp and Bruxner Way realignment.

Overall, earthworks and rail civil works are likely to result in the highest noise levels during construction. Some sensitive receptors may experience noise levels in excess of the relevant noise management levels. The noise assessment considered reasonable, worst-case construction scenarios of 15-minute duration. Particularly noisy activities, such as rock hammering and the use of concrete saws, are unlikely to persist for the entire construction phase. Construction of the proposal is expected to occur progressively. Due to the linear nature of the proposal, noise levels experienced by sensitive receptors will decrease as construction progresses along the proposed alignment, moving further away from sensitive receptors.

Predicted noise levels associated with construction traffic, the construction camp and Bruxner Way realignment during the operation phase, comply with the relevant noise management levels.

Certain construction activities have been assessed as vibration intensive. These activities include the use of piling rigs and vibratory rollers. Minimum working distances of up to 100 m will apply to vibration-intensive activities.

A Construction Noise and Vibration Management Plan will be developed to manage potential noise and vibration impacts. Construction activities in the vicinity of sensitive receptors will be undertaken during the approved construction hours and in accordance with all relevant conditions of approval.

Operational noise and vibration

The operational noise and vibration assessment considered the increased noise and vibration impacts from operational road traffic in relation to the proposed realignment of Bruxner Way and freight rail operations including daily train movements on the main line, the crossing loop operations and the active level crossings.

A desktop assessment of the road realignment of the Bruxner Way was undertaken to predict the potential noise impacts associated with alteration of the alignment closer to residential receptors. This assessment was conducted in accordance with the relevant criteria outlined in the NSW Road Noise Policy (NSW EPA, 2011) for road redevelopment.

In cases where existing traffic noise levels are above the noise assessment criteria, the primary objective is to reduce these levels through feasible and reasonable measures to meet the assessment criteria. In assessing feasible and reasonable mitigation measures, an increase of up to 2 dBA represents a minor impact that is considered barely perceptible to the average person. As the nearest residential receiver is located 2.3 km away from the section of road to be realigned, it was found that noise levels at the most affected receiver are not predicted to increase by more than 0.3 dBA due to the proposed realignment. Therefore, no further consideration of mitigation is necessary at this stage.

The detailed predictions for operational rail noise and vibration identified the noise and vibration trigger levels from the *Rail Infrastructure Noise Guideline* (NSW EPA, 2013) can be achieved at many sensitive receivers in the area surrounding the proposed rail alignment.

The predicted rail noise levels were above the *Rail Infrastructure Noise Guideline's* (NSW EPA, 2013) noise criteria at three receivers at the proposal's opening in 2025 and an additional two receptors, for a total of five receptors, by the design year of 2040. Each receiver is a single dwelling in isolation from neighbouring or nearby properties and, in line with ARTC's strategy for noise management of the proposal, were deemed eligible for the consideration of architectural acoustic treatment of the dwellings and upgrades to any existing property boundary fencing.

The assessment determined that ground-vibration levels and ground-borne noise levels from rail operations are predicted to comply with the relevant trigger levels. On this basis, it was not necessary to consider mitigation measures for ground vibration or ground-borne noise.

Air quality

The proposal will be designed, constructed and operated in a way that protects the environmental values of air. An air quality impact assessment of the proposal considered both construction and operation phases.

Air emissions from the construction of large, linear infrastructure projects are difficult to estimate due to the broad range and transitory nature of construction activities. Also, construction sites are distributed across a large geographical area. As such, emissions from the proposal during construction were assessed qualitatively through a review of anticipated construction activities, plant and equipment.

The qualitative impact assessment found that unmitigated emissions due to construction activities, plant and equipment pose a low risk to human health, but a medium risk in terms of dust deposition. To mitigate potential impacts related to dust deposition, a site-specific air quality and dust management sub-plan will be developed as part of the Construction Environmental Management Plan. The sub-plan will account for variability in dust emissions during construction.

Dispersion modelling was used to estimate emissions of TSP, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC and polycyclic aromatic hydrocarbons during the operation phase. The concentration of each pollutant is expected to comply with the relevant air quality criteria at the nearest sensitive receptors.

The following measures will be implemented during the operation phase to further minimise the concentration of each pollutant at sensitive receptor locations:

- Community consultation will occur before undertaking works that may cause adverse air quality impacts
- A complaints management system will be established for air quality complaints
- Train idling will be minimised near sensitive receptors.

Sustainability

Sustainability is an important consideration for the proposal, especially regarding maximising resource efficiency, enhancing local economic activity, and mitigating potential environmental and social impacts.

The *Inland Rail Sustainability Strategy* (ARTC, 2019) and the *Inland Rail Environment and Sustainability Policy* (ARTC, 2018) outline sustainability objectives, targets and commitments for the proposal. These objectives, targets and commitments include implementation of a sustainability management plan and the pursuit of an 'Excellent' rating against version 1.2 of the Infrastructure Sustainability Council of Australia's (ISCA) rating scheme.

A broad range of sustainability initiatives were identified and incorporated into the proposal during the development of a reference design. Sustainability management measures have also been incorporated into the proposal mitigation measures. The identified sustainability initiatives and future opportunities will contribute towards achieving an Infrastructure Sustainability rating for the Proposal against version 1.2 of the Scheme and will contribute to the overall 'Excellent' rating for the Program.

Climate change risk and adaptation

A climate risk assessment was undertaken to inform the design and operation of the proposal. The assessment considered short-term risks (out to 2030) and long-term risks (out to 2090) using two climate projection scenarios. A total of 34 climate risks were identified: two relating to the construction phase and 32 relating to the operation phase of the proposal. Of the 34 identified risks, five risks are high and one risk is very high by 2030, increasing to seven high risks and three very high risks by 2090, representing 31 per cent of the total assessment. Key risks include:

- Extreme rainfall and flooding resulting in delays to the construction schedule, construction cost overruns and inundation of the track during operation
- Extreme heat resulting in track twisting (buckling) and potentially impacting the health and safety of workers
- Extreme storm and wind events damaging electrical, communications and other infrastructure.

A broad range of measures are proposed to mitigate impacts due to climate change. In some instances, a changing climate can result in positive outcomes; however, the measures proposed to mitigate climate impacts are designed to avoid risks where possible (through design) or manage risks that are unavoidable (through construction and operation management plans). A residual risk assessment for the proposal was undertaken to apply the relevant identified adaptation measures for all 'very high' and 'high' risks. In addition, identified adaptation measures contributed towards treating all 'medium' risks, resulting in a number of those 'medium' risks having their corresponding residual risks revised to 'low'. Based on the application of the adaptation measures, no residual 'very high' or 'high' risk ratings remain for the proposal, which satisfies both the Secretary's Environmental Assessment Requirements (SEARs) and ISCA requirements.

The measures to manage climate risks are developing and evolving. As the proposal's lifecycle progresses, risks will be regularly reviewed to ensure that potential climate impacts are reduced so far as is reasonably practicable. Emerging opportunities to manage potential impacts will also be investigated.

Traffic and transport

During the construction phase, transporting materials, equipment and personnel will primarily occur via existing road and rail networks. Construction materials and equipment will be delivered to centralised laydown areas along the proposed alignment. The laydown areas have been designed with vehicle accessibility and safe manoeuvrability in mind.

Relative to existing traffic in the region, construction traffic has the potential to increase traffic volumes by up to five per cent. During construction, there will also be alterations to the public road network (e.g. a permanent realignment of Bruxner Way, as well as minor diversions to facilitate track and level crossing works). As a result, during construction the level of service of some aspects of the road network is expected to reduce during the construction period.

The proposal intersects roads at several locations and the proposed treatments and level of protection at road–rail interfaces are based on the outcome of the assessment undertaken by ARTC using the *Australian Level Crossing Assessment Model*, which considers factors such as future road traffic numbers, vehicle types, train numbers, speeds and sighting distances. Private level crossing locations have been discussed with landowners and consultation is ongoing. The reference design has determined that the levels of protection proposed (active or passive level crossings) in accordance with the Australian Level Crossing Assessment Model. Further refinement of level crossings will take place in detailed design and in consultation with affected landowners.

During the operation phase, impacts to the road network are expected to be negligible. On average, small maintenance crews may need to inspect the track and conduct routine maintenance activities once per month. However, traffic movements will be mostly confined to the rail corridor.

Increases in traffic associated with the construction of the proposal are likely to increase vehicle exposure at rail crossings. Public level crossings will be designed in accordance with safe design standards considering sufficient stacking distances, sight distances, lane marking, and signage for a design vehicle consisting vehicles as per the road classification. Safe design standards will be implemented to minimise and mitigate the impact, magnitude and likelihood of crash potential at level crossings.

The *Strategic Plan for NSW Level Crossings 2010–2020* (NSW Transport, 2018), *Rail Safety National Law* (NSW) No 82a and National Railway Level Crossing Safety Strategy will be used with their associated key performance indicators to ensure that mitigation measures for all public road–rail interface locations (level crossings) focus on safety, risk and operational efficiency. In addition, threshold and *Australian Level Crossing Assessment Model* assessment will be undertaken by ARTC before construction and post-construction to determine the appropriate protection type for the proposed crossing.

The overall aim of the construction and operation of the proposal is to maintain the safety and efficiency of all affected transport modes, for the proposal workforce, and for other transport system users; to avoid or mitigate impacting the condition of transport infrastructure; and ensuring any required works are compatible with existing infrastructure and future transport corridors.

Landscape and visual amenity

The landscape and visual impact assessment examined the impact of the proposal on landscape and visual and lighting amenity through a combination of desktop and field work, including geographic information system analysis, visibility analysis mapping and preparing illustrative cross-sections and visualisations.

The proposal is situated in a gently undulating rural area comprised of open wooded, pastoral and agricultural landscapes. Six landscape character types were identified within the region. Some highly localised changes to the landscape character types may occur as a result of the proposal; however, the proposal will not result in fundamental changes to any of the landscape character types.

There are relatively few visual receptors near the proposal. This is due to isolated farmsteads being set on large private farms, and views of the proposal being interrupted by vegetation and other features of the landscape. The main views of the proposal will be obtained from North Star Road and Bruxner Way, which run parallel to the proposed alignment.

As part of the visual assessment, six representative viewpoints of the proposal were identified and assessed. During the construction phase, visual receptors may experience moderate visual impacts at three of the representative viewpoints. The viewpoints are:

- From North Star Road looking north—construction work will occur within and alongside the existing rail corridor at this viewpoint. Isolated rural properties in the area may be temporarily impacted due to the presence of construction laydown areas, site offices and fuel storage facilities
- From Bruxner Way looking north-east—construction of proposed embankments, rail and bridge infrastructure, and the Bruxner Way realignment, will be highly visible from this viewpoint. The presence of existing rail infrastructure (power poles and powerlines) will limit changes to the visual character of the landscape; however, local residents and travellers on Bruxner Way may still be impacted
- From Tucka Tucka Road looking east (near the access road to Toomelah community)—from this viewpoint, vegetation clearing, laydown areas, and construction of proposed embankments, rail and bridge infrastructure will be highly visible. As Tucka Tucka Road is the primary access road to Toomelah, the views of local residents may be impacted while travelling.

During the operation phase, visual receptors may experience high visual impacts from Tucka Tucka Road looking east, near the access road to Toomelah community. Widespread changes in the visual character of the landscape are expected due to the proposed embankments, Macintyre River viaduct and the movement of double-stacked freight trains up to 6.5 m high and 1,800 m long.

Measures will be implemented during the construction and operation phases to mitigate potential impacts on landscape character and amenity. Additionally, aspects of landscape character and amenity will be incorporated into detailed design process, resulting in a positive legacy for the proposal.

Land use and property

The proposal is situated in the New England North West Region of NSW. It passes through two local government areas: Gwydir Shire Council and Moree Plains Shire Council.

The proposal is primarily located within the existing, non-operational Boggabilla rail corridor, where there is no defined lot or tenure. It is understood that the Boggabilla rail corridor is not separated from adjoining properties; landowners regularly move livestock and machinery across the rail corridor.

Outside of the Boggabilla rail corridor, the proposal mostly traverses freehold land parcels. However, it also traverses one parcel of NSW Government tenure, one parcel of unknown tenure, four parcels of Crown land used for travelling stock reserves, and one parcel of Crown land used for irrigated cropping.

Existing land uses in the vicinity of the proposal include grazing, grazing modified pastures, and cropping. The proposal intersects regional roads, local roads, private access roads and utilities. The proposal also crosses Mobbindry, Forest Creek, Back Creek, Whalan Creek and the Macintyre River, which are mapped watercourses.

Construction and operation of the proposal may result in direct and permanent impacts to land use and tenure. Potential impacts include:

- Change in tenure and loss of property
- Disruption to land over which native title claims have been made
- Change in land use, including the sterilisation of agricultural land and disruption to agricultural practices and alterations to Travelling Stock Reserves and informal stock routes
- Impacts to accessibility including impacts on the road network and to property access
- Impacts on utilities.

The proposed alignment was deliberately designed to optimise the existing, non-operational Boggabilla rail corridor, where possible. Therefore, many potential impacts to land use and tenure have been avoided. Where impacts cannot be avoided, they will be carefully managed and mitigated through:

- Property acquisitions undertaken in accordance with the relevant statutory instruments and in consultation with landholders
- Land required temporarily during the construction phase rehabilitated in accordance with a Reinstatement and Rehabilitation Plan
- Traffic Management Plan developed and implemented during the construction phase to address key impacts to accessibility
- Consultation with utility providers regarding requirements for relocation or protection of services impacted by the proposal.

Socio-economic impact assessment

As with all major projects located near human settlements, adverse social and economic impacts may be experienced by residents living near the proposed alignment. Potential impacts include:

- Property impacts such as land acquisition, severance of productive agricultural land, and disruptions to farm infrastructure
- Community conflict regarding the proposal, which may affect community cohesion
- Amenity impacts due to noise, changes to visual amenity, dust, and increased traffic
- Disruption of social land uses such as family events and fishing where the Macintyre River and surrounds are affected by bridge works
- Traffic delays during construction of rail over road bridges, level crossings and road realignments
- Uncertainty and fears about the proposal's impacts are likely to cause stress for some residents living near the proposed alignment
- Over time, a decrease in road freight volumes may affect levels of trade for local transport businesses
- At the regional level, if multiple Inland Rail projects are constructed at the same time, there may be a significant draw on trades and construction labour.

The location of the construction camp and laydown areas in North Star is likely to cause a significant temporary population influx, traffic increases, changes to the town's identity as a quiet rural community and increase demand for services.

The proposal will contribute positively to the regional community. For instance, the proposal will generate up to 350 jobs during the construction phase and up to 50 jobs during the operation phase. This job creation will contribute to financial and housing security, self and family care, and social connections.

Local and regional businesses will also benefit from the proposal. Opportunities to supply the proposal may include supplies of fuels, equipment, borrow and quarried material, and services including fencing, electrical installation, rehabilitation landscaping, maintenance and trade services. The expansion in construction activity would support additional flow-on demand and spending by the construction workforce, further increasing trade levels in the region.

The Social Impact Management Plan has been developed as part of the EIS and includes management measures that will be delivered during the post-approval, pre-construction and construction in relation to community and stakeholder engagement, workforce management, housing and accommodation, health and community wellbeing and local business and industry. The Social Impact Management Plan will include:

- An early, co-operative and effective community and economic development program with the Toomelah community
- Working closely with directly affected property owners to mitigate their specific concerns and develop compensation, mitigation or offset strategies
- Working with the North Star community to manage impacts during construction and achieve positive long-term social outcomes
- Working with community members to identify how the proposal could contribute to enhancement of community values and quality of life
- Identifying all local and Aboriginal businesses that could contribute to the supply chain and working with them to explore opportunities to mitigate or offset impacts on these businesses.

At a local level, the economic impact of the proposal will promote community development by supporting local and regional employment, businesses and industries.

The proposal will support regional development through:

- Opportunities to encourage, develop and grow Indigenous, local, and regional businesses through the supply of resources and materials for the construction and operation of the proposal
- Opportunities in secondary service and supply industries (such as retail, hospitality and other support services) for businesses near the construction footprint and the proposed accommodation camp at North Star. The expansion in construction activity is also likely support additional flow-on demand and additional spending by the construction workforce in the local community.

The proposed alignment has been designed to minimise impacts to local business and industry; however, the proposal may result in disruption to agricultural, transportation and tourism businesses through:

- The loss of agricultural land (through disturbance, acquisition, or sterilisation), disruption to farm management, or changes in accessibility or connectivity to market. This may negatively impact on the productive capacity and total economic value-add from the local agricultural industry. ARTC will work with individual landowners to develop suitable management solutions based on individual farm management practices to mitigate and manage these impacts
- Once the proposal is operational, enhanced competition between rail and road freight modes may decrease the total demand for road freight, impacting on levels of trade for local transportation businesses.

The economic benefits assessment estimate that the proposal is expected to provide a total of $62.62 million in incremental benefits (at a 7 per cent discount rate). These benefits result from improvements in freight productivity, reliability and availability, and benefits to the community from crash reductions, reduced environmental externalities and road decongestion benefits.

The proposal will promote regional economic growth across the New England North West region. Using recent labour market trends to inform workforce capacity and capability within the local region, it is likely that the labour market conditions that will prevail during the construction phase of the proposal will be closer to those characterised by the 'slack' labour market scenario. Under this scenario, at the end of the construction phase, real Gross Regional Product for the region is projected to be $79 million higher than the baseline level.

Under a slack labour market scenario, the proposal is also expected to deliver an additional 448 jobs per year over the construction period.

Hazard and risk

Health, safety and environmental hazards and risks have been assessed in the context of the proposal. The assessment was undertaken in accordance with the *State Environmental Planning Policy No 33—Hazardous and Offensive Development* (SEPP 33) and *AS/New Zealand Standard (NZS) ISO 31000:2009* (compliant with ISO 31000:2018).

Hazards have been identified for construction, operation and decommissioning (as it relates to construction) phases and have been evaluated qualitatively to determine those that are likely to give rise to risks requiring detailed assessment or further risk management strategies. All risks were given a residual risk ranking of either low or medium, meaning that all risks are reduced to a level that is tolerable or reduced so far as reasonably practicable.

The risk assessment identifies that hazards falling into medium risk levels relate to potential incidents concerning:

- Flooding or severe weather events
- Natural events exacerbated by climate change
- Landslide, sudden subsidence, or movement of rocks or soil
- Employee fatigue and/or heat stress
- Increased use of road vehicles for the proposal
- Operating live trains in the disturbance footprint
- Increased number of interfaces between live trains and road users, including pedestrians and land users
- Interaction with existing underground and overhead utilities
- Bridges
- Interference with emergency access
- Transport of dangerous goods freight
- Potential use of explosives for construction.

Public health and safety values that may be impacted from the proposal and other potential hazards such as biosecurity, wildlife, natural events, dust (e.g. respirable silica, coal and other airborne contaminants such as naturally occurring asbestos), noise and vibration have been assessed with low or medium residual risks, given the low frequency of occurrence (or probability or likelihood) or minor impact associated in the event of such incidents occurring.

Waste and resource management

Major waste streams generated during construction of the proposal are likely to include:

- Vegetation, roots, tree stumps, and general rubbish and debris
- Establishing laydown areas and the construction camp may generate some minor quantities of metal, wood, concrete and packaging waste
- Wastewater streams are likely to include greywater and sewage from the construction camp and site amenities, as well as vehicle and equipment wash-down water
- Food, paper, cardboard, plastic, metal (including aluminium cans), glass and electrical waste will be generated by staff at the construction camp and site offices
- Maintenance fluids generated by the operation of construction plant and equipment include paints, solvents, lubricants and oils.

Waste generation during the operational phase of the proposal would mainly be a result of track maintenance, weed control and litter deposited within the rail corridor.

A preliminary assessment of existing waste management facilities within 150 km of the proposal indicates that there is sufficient capacity for the expected waste streams and volumes to be disposed of in licensed facilities. The available and permissible capacity of each waste management facility will be confirmed in consultation with the waste management providers during the next phase of the proposal.

To management potential impacts related to waste and resource management, a waste management strategy will be developed as a sub-plan to the construction environmental management plan. The proposal will adopt a hierarchical approach to waste management, from the most preferable (avoid or reduce, re-use, recycle, recover energy and treat) to the least preferable (disposal). Where waste cannot be avoided, waste materials will be segregated by type for collection and removal by licensed contractors. The waste management sub-plan will ensure compliance with relevant legislation and any conditions of approval imposed on the proposal.

Cumulative impacts

Cumulative impacts take into consideration the residual impacts of the proposal and assess the impact against other coordinated or major projects and their potential residual impacts with relevant temporal and spatial boundaries. The potential for cumulative impacts resulting from the interaction of the proposal with other projects, either existing or proposed, in the surrounding area is considered low for all aspects except biodiversity, where cumulative loss of habitat will place further pressure on local threatened flora and fauna species and ecological communities.

Depending on the timing of the construction of the proposal and other projects, there may be an increase in traffic, housing demand and workforce demand; however, these impacts have cumulative impacts of low significance except on aspects of biodiversity where there is the potential for some proposal activities to have a cumulative, irreversible or permanent impact on some ecological receptors, even after the implementation of mitigation measures. In these cases, compensation for the residual impact will occur.

There are no anticipated cumulative impacts during the operation phase of the proposal.

Concluding statement

The proposal involves constructing approximately 30 km of single-track, standard-gauge rail line between North Star and the NSW/QLD border, operated as part of Inland Rail. The proposal is needed to support the development of the overall Inland Rail network between Melbourne and Brisbane.

Potential impacts resulting from the proposal are considered manageable through the implementation of the proposed mitigation and management measures.

The detailed design for the proposal will be developed with the objective of minimising potential impacts on the local and regional environment and the local community. The design and construction methodology would continue to be developed with this overriding objective in mind, considering the input of stakeholders.

To manage potential impacts identified by the EIS, and in some cases remove them completely, the EIS outlines a range of mitigation measures that would be implemented during detailed design, construction and operation of the proposal. The Environmental Management Plan summarises the environmental mitigation and management measures that would be implemented. The environmental performance of the proposal would be managed by implementing the Construction Environmental Management Plan, which will also ensure compliance with relevant legislation and any conditions of approval.

With the implementation of the proposed mitigation and management measures, the potential environmental impacts of the proposal would be adequately managed.