INLAND RAIL

Summary of findings

North Star to NSW/Queensland Border

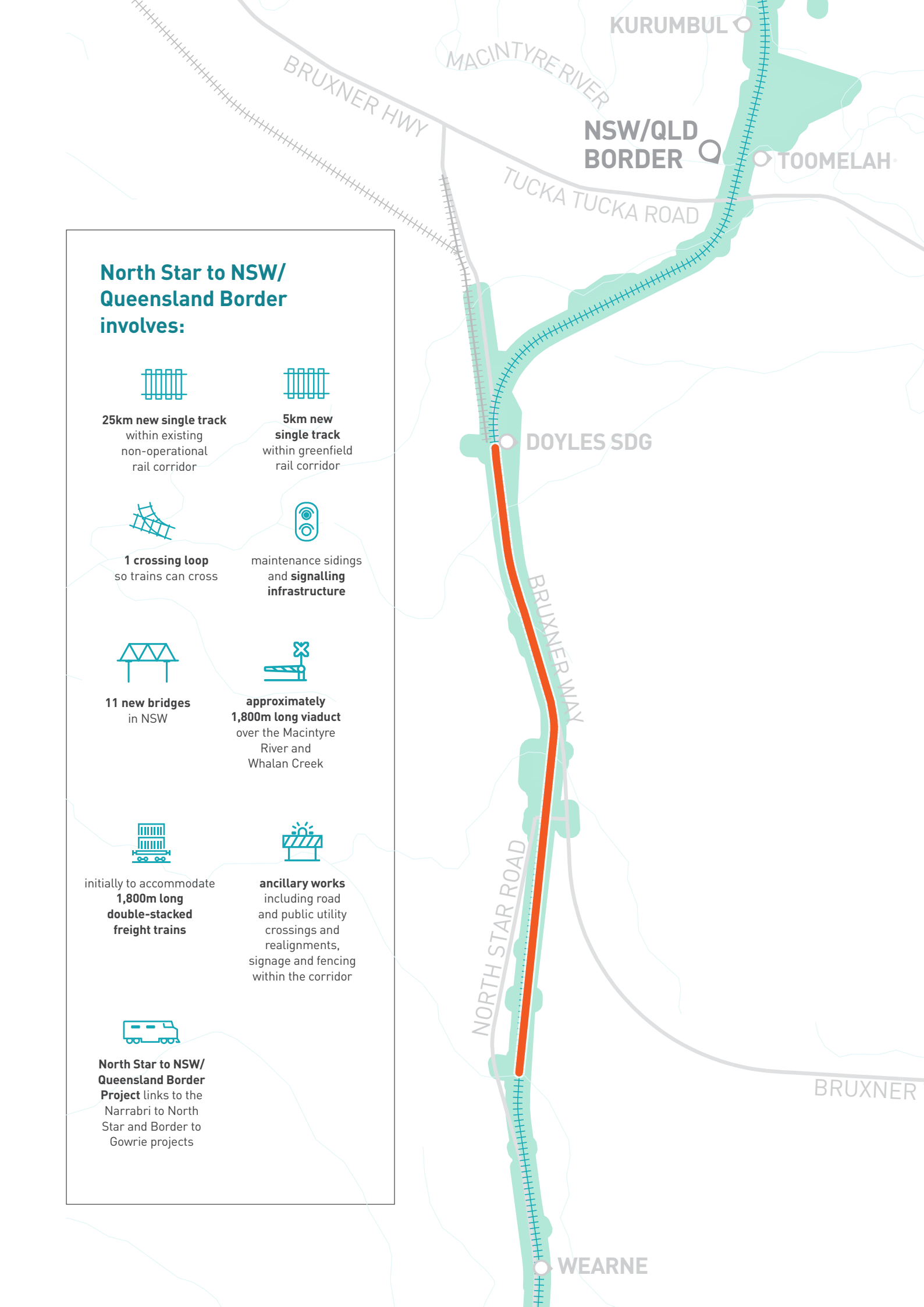
Environmental Impact Statement

ARTC

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

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.



North Star to NSW/ Queensland Border involves:

25km new single track within existing non-operational rail corridor

5km new single track within greenfield rail corridor

1 crossing loop so trains can cross

maintenance sidings and **signalling infrastructure**

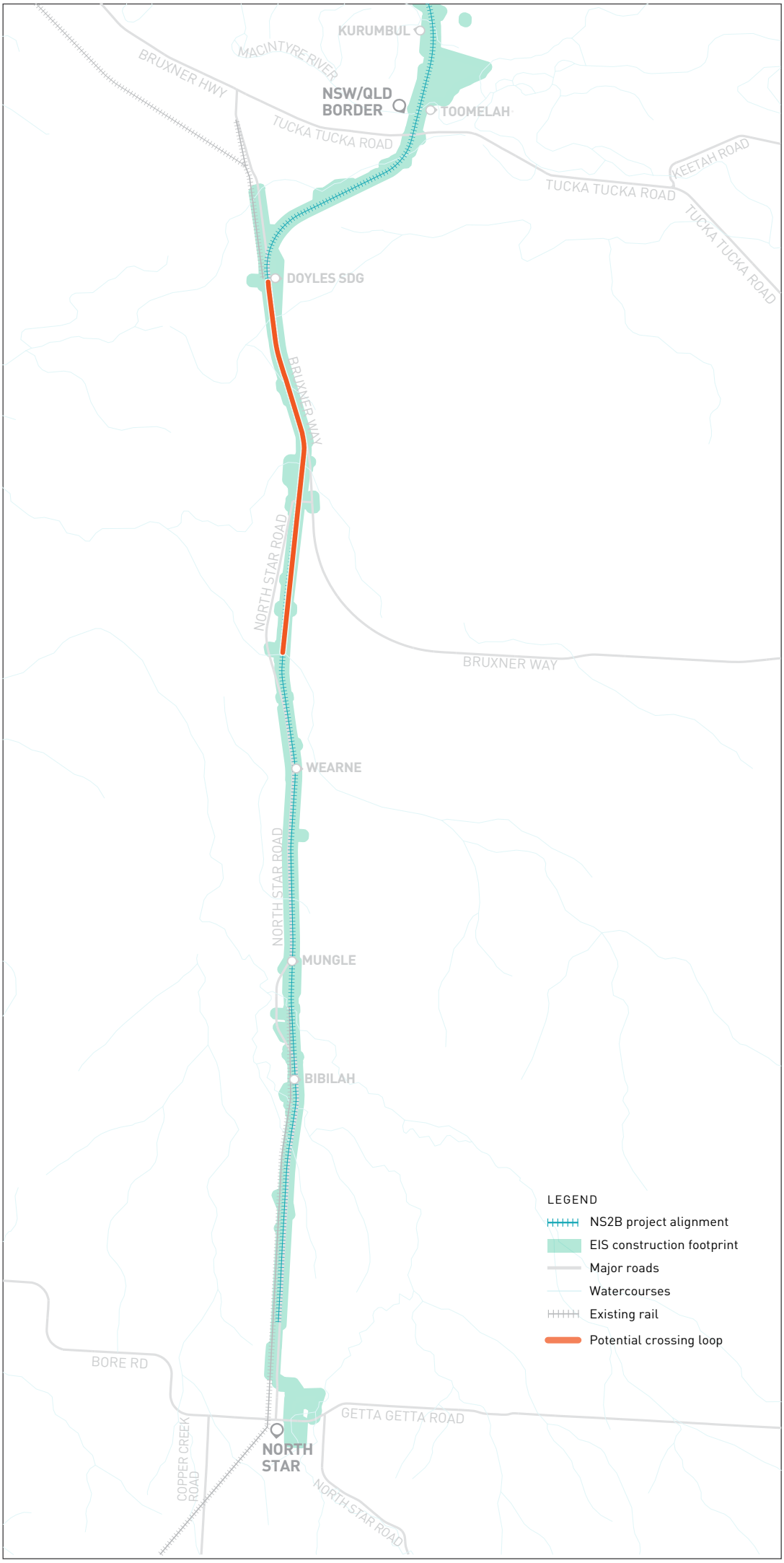
11 new bridges in NSW

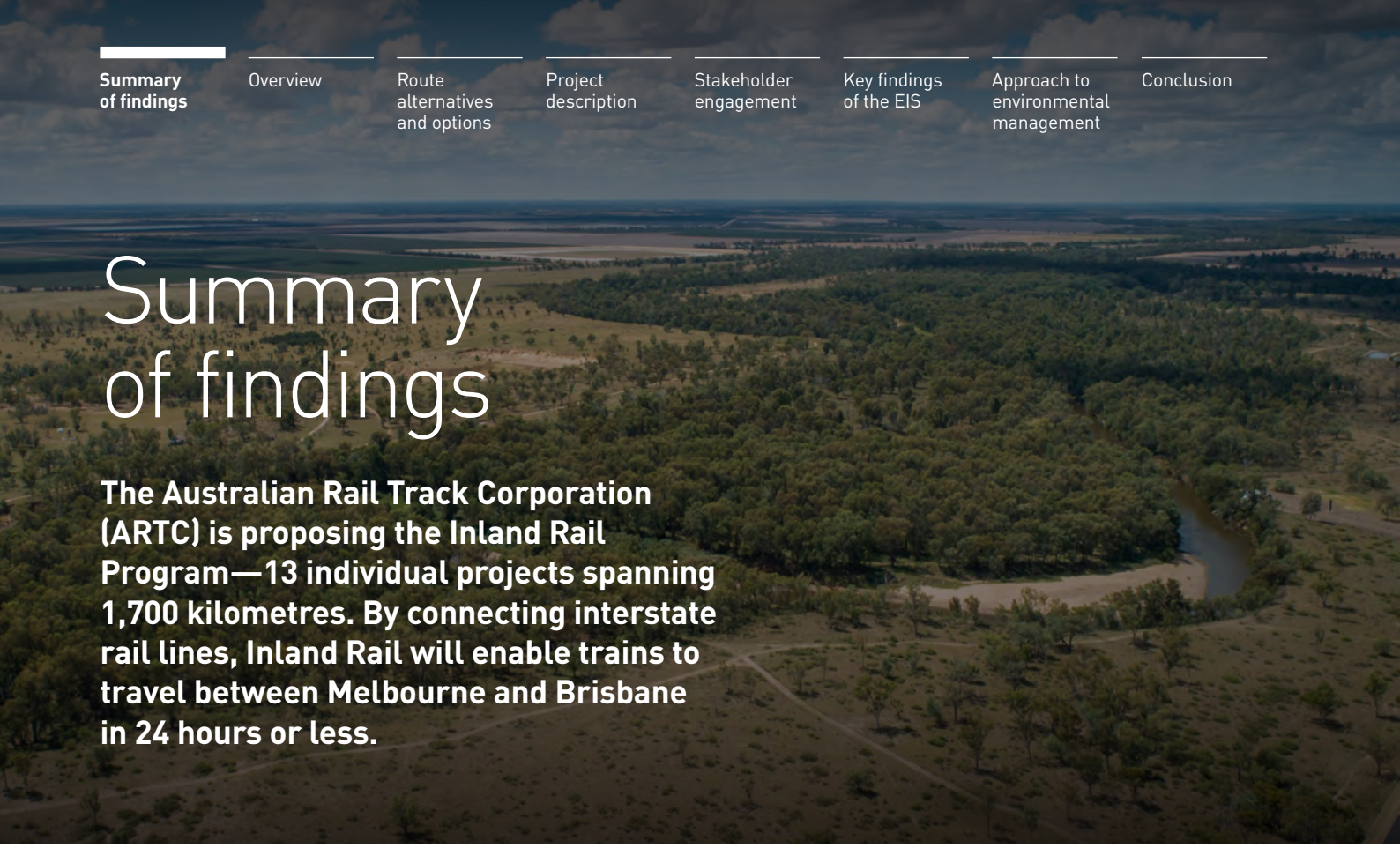
approximately 1,800m long viaduct over the Macintyre River and Whalan Creek

initially to accommodate **1,800m long double-stacked freight trains**

ancillary works including road and public utility crossings and realignments, signage and fencing within the corridor

North Star to NSW/ Queensland Border Project links to the Narrabri to North Star and Border to Gowrie projects


KURUMBUL
MACINTYRE RIVER
BRUXNER HWY
NSW/QLD BORDER
TOOMELAH
TUCKA TUCKA ROAD
KEETAH ROAD
TUCKA TUCKA ROAD
TUCKA TUCKA ROAD
DOYLES SDG
BRUXNER WAY
NORTH STAR ROAD
BRUXNER WAY
WEARNE
NORTH STAR ROAD
MUNGLE
BIBILAH
BORE RD
GETTA GETTA ROAD
COPPER CREEK ROAD
NORTH STAR
NORTH STAR ROAD
LEGEND
NS2B project alignment
EIS construction footprint
Major roads
Watercourses
Existing rail
Potential crossing loop



Summary of findings

The Australian Rail Track Corporation (ARTC) is proposing the Inland Rail Program—13 individual projects spanning 1,700 kilometres. By connecting interstate rail lines, Inland Rail will enable trains to travel between Melbourne and Brisbane in 24 hours or less.

North Star to NSW/Queensland Border Project

The North Star to New South Wales (NSW)/Queensland Border Project is just one of the 13 projects that, combined, make up the Inland Rail Program.

The North Star to NSW/Queensland Border section under assessment includes approximately 30 kilometres of single-gauge railway, comprising 25 kilometres of the existing, non-operational Boggabilla rail corridor and five kilometres of greenfield corridor to the north of the alignment, up to the NSW/Queensland border.

The Project will enable trains to connect with other sections of Inland Rail to the north and south and be constructed to accommodate 1,800-metre-long double-stacked freight trains. The Project is located within the Gwydir Shire Council and Moree Plains Shire Council Local Government Areas.

Purpose of this 'Summary of findings'

An Environmental Impact Statement (EIS) has been prepared for the North Star to NSW/Queensland Border Project. The EIS describes the Project, considers potential environmental, social and economic impacts of the Project, and identifies measures to avoid, minimise and mitigate these impacts.

The EIS is a robust, thorough and comprehensive document with analysis and input from technical and scientific experts to demonstrate the Project is based on sound environmental principles and practices that have met the Department of Planning, Industry and Environment's (DPIE) assessment requirements.

> The Project will initially be constructed to accommodate 1,800-metre-long double-stacked freight trains.

Want to know more?

See

- **Chapter 0: Executive Summary**
- **Chapter 5: Planning and Assessment Process**
- **Chapter 10: Assessment Methodology**
- **Appendix A: Basis of Assessment Technical Report**
- **Appendix C: Consistency with Relevant Planning Strategies**

of the Environmental Impact Statement

It also captures feedback from landowner consultation and other stakeholders such as councils, state agencies, industry and the wider community.

This summary document provides an overview of the EIS prepared for the North Star to NSW/Queensland Border Project. It is a high-level overview of each chapter of the EIS. It summarises the major findings of the technical studies and shows you where in the EIS you can find more information.

It is intended to be read alongside the Project's Environmental Management Plan **(see Chapter 27: Environmental Management Plan)** which outlines the strategies which will be used to address the identified impacts and recommendations in the EIS. If you did not receive a copy of the Project's Environmental Management Plan, please contact ARTC Inland Rail on **1800 732 761** or visit **planningportal.nsw.gov.au/major-projects** to access an electronic version.

The summary document also explains how you can make a submission to DPIE about the EIS.

State Significant Infrastructure and Australian Government requirements

State Significant Infrastructure (SSI) in NSW includes major transport developments which have wide community significance due to their size, economic value or potential impacts. Such projects are assessed via an SSI application and an EIS under the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act).

Major projects which could have a significant impact on matters of national environmental significance may also require a referral to the Australian Government's Department of Agriculture, Water and the Environment (DAWE) in addition to Ministerial approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Project has been referred to both DPIE and DAWE. It is a SSI project under the EP&A Act and a 'Controlled Action' under the EPBC Act.

ARTC is currently seeking the Project be declared Critical State Significant Infrastructure (CSSI) by the Minister under the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP), and this matter is currently undetermined. CSSI projects are high priority infrastructure projects essential to the State. Section 5.13 of the EP&A Act provides that any SSI may also be declared to be CSSI if it is *'...of a category that, in the opinion of the Minister, is essential for the State for economic, environmental or social reasons'*. If declared, the Project remains subject to assessment under Part 5.2 of the EP&A Act and requires the approval of the Minister for Planning.

Planning and assessment process

ARTC is seeking approval to construct and operate the North Star to NSW/Queensland Border section of Inland Rail under the EP&A Act and the EPBC Act.

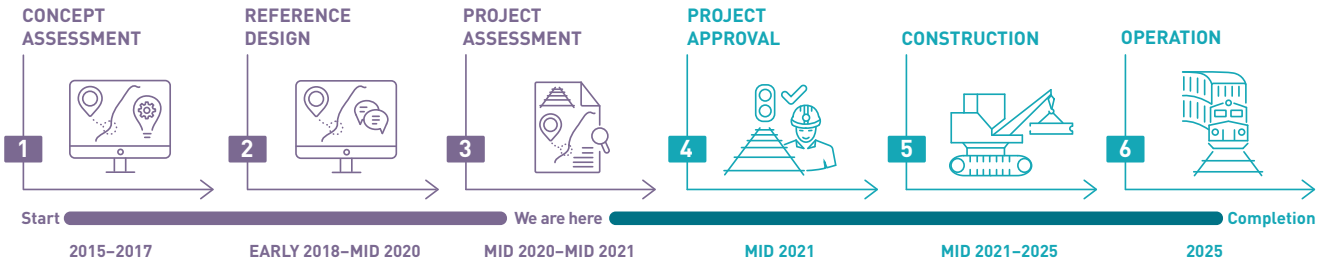
The EIS supports an application for approval of the Project under Part 5 Division 5.2 of the EP&A Act. It addresses the environmental assessment requirements of DPIE Secretary's Environmental Assessment Requirements (SEARs) dated 8 August 2018. The SEARs are included in **Appendix A: Basis of Assessment Technical Report.**

The Project is also a controlled action under the EPBC Act and requires approval from the Australian Government Minister for the Environment. The EPBC Act assessment requirements are detailed in the SEARs.

The EIS was submitted to DPIE in August 2020 as required under the SSI assessment process. It outlines the Project's key features, assesses its potential environmental and social impacts during construction and operation, and offers proposed mitigation measures.

The EIS has been put on public exhibition for 42 days. It is available to view via **planningportal.nsw.gov.au/major-projects** Community members and other stakeholders can now provide feedback and make formal submissions.

North Star to NSW/Queensland Border Project timeline



**Timeframes are indicative and are subject to change*

How to have your say

Any person, group or organisation can make a submission about the Project's EIS to DPIE. During the exhibition period, the public is invited to view the EIS and lodge a submission to DPIE. Submissions are considered by DPIE when evaluating the EIS.

Online

To make a submission online, please follow the steps below:

1. View the EIS and other project documents at **planningportal.nsw.gov.au/major-projects**
2. Log in or create a user account
3. Find the project you want to have your say on and check the submission box
4. Before making your submission, please read DPIE's privacy statement. DPIE will publish your submission on its website in accordance with the privacy statement
5. Your submission can either be typed or uploaded as a PDF and must include:
   - the application name and number
   - a statement on whether you support or object to the proposal
   - the reasons why you support or object to the proposal
   - a declaration of any reportable political donations made in the last two years.
6. Agree to the online statement and lodge your submission.

By post

You may also lodge your submission via post by sending it to:

Director Transport Assessments
Department of Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Written submissions must include:

- your name and address, at the top of the letter only
- the name of the application and the application number
- a statement on whether you support or object to the proposal
- the reasons why you support or object to the proposal
- a declaration of any reportable political donations made in the previous two years.

All submissions must reach DPIE before the close of the exhibition period. All submissions will be made public in line with DPIE's objective to promote an open and transparent planning system. If you do not want your name published, please state this clearly at the top of your submission. DPIE can be contacted on **1300 305 695.**

What happens after the submission period?

Following the submission period, DPIE provides ARTC with submissions received and publishes submissions online. ARTC will respond to submissions through a submissions report to DPIE.

DPIE then assesses the Project and makes a recommendation to approve the Project or not, including either conditions of consent or reasons for refusal. The recommendation is referred to the NSW Minister for Planning and Public Spaces, or a delegate, for determination.

Under the joint agreement between the NSW and Australian governments for matters governed by state and federal environmental law, DPIE's Environmental Assessment Report and Minister's decision is forwarded to DAWE with a recommendation for the Australian Government Minister on whether the controlled action should be approved, with or without conditions.

ARTC help is available

If you're unable to access the EIS or supporting documents online, or have any questions, please contact ARTC Inland Rail on **1800 732 761**.

If you need help with reading, or if English is your second language, please call **13 14 50**. This free service will help you read this document and other relevant project information.

Overview

Inland Rail will transform the way freight is moved around the country, connect regional Australia to markets more efficiently, drive substantial cost savings for producers and consumers, and deliver significant economic benefits.

Australia faces increasing pressure to efficiently, effectively and safely transport ever increasing volumes of freight, especially between our major cities. The east coast of Australia comprises 18 million residents or 79% of Australia's total population. Export trade through east coast ports is estimated to contribute approximately $260 million annually.

What is Inland Rail?

Inland Rail is a significant piece of national transport infrastructure that will enhance Australia's existing rail network and serve the interstate freight market.

The Inland Rail route

approximate length **1,700km**

uses **existing interstate rail corridor** through Victoria and southern New South Wales

approximately **400km of existing corridor**, mainly in western New South Wales

approximately **600km of new corridor** in northern New South Wales and South East Queensland

North Star to NSW/ Queensland Border is one of the **13 Inland Rail projects**

Want to know more?

See

- **Chapter 1: Introduction**
- **Chapter 2: Strategic Context**

of the Environmental Impact Statement

Justification for Inland Rail

Currently, there is no continuous Inland Rail link between Melbourne and Brisbane. Interstate rail travels between Melbourne and Sydney, via Albury and between Sydney and Brisbane along the coast. The existing north–south coastal railway does not have the capacity to meet the future demand for freight due to congestion and the inability to accommodate double-stacked trains, which will impact freight productivity, transport costs and passenger services.

However, to provide a viable option compared to trucks, Inland Rail must deliver freight in times close to those achieved by trucks, cheaper than trucks, and with reliability and predictability comparable to trucks.

The infrastructure has been designed to accommodate 1,800-metre-long trains with double-stacked containers. However, shorter and single-stacked trains will also operate. This will provide a high degree of interoperability, with most freight configurations available.

Consequences of not proceeding with Inland Rail

Not progressing with Inland Rail would potentially hinder the national economy. The continuing growth in freight demand requires urgent attention. Without making a step-change in rail efficiency and performance, pressure on the road networks will increase, freight costs will rise, consumers will pay more for products, and productivity in important sectors could decline.

Without Inland Rail, road would increasingly become the dominant mode, with rail becoming less relevant. A continued over-reliance on road transport to meet the future east coast freight demand will increase the vulnerabilities to demographic changes that are, even today, driving shortages of long-distance truck drivers and increasing costs.

What Inland Rail will offer

ARTC's service offering is central to the delivery and competitiveness of Inland Rail and reflects the priorities of freight customers. Developed in consultation with key market participants and stakeholders, the key elements to be delivered by Inland Rail for competitive and complementary service offering compared to other modes include:

- **reliability:** 98% defined as the percentage of goods delivered on time by road freight, or available to be picked up at the rail terminal or port
- **price:** cheaper relative to road transport as a combined cost of access to the rail network, rail haulage, and pick-up and delivery
- **transit time:** 24 hours or less from Melbourne to Brisbane
- **availability:** services available with departure and arrival times that are convenient for customers.

Benefits of proceeding with Inland Rail

Direct benefits

- improved access to and from regional markets
- reduced costs for the market
- improved reliability and certainty of transit time
- increased capacity of the transport network
- reduced distances travelled
- improved safety
- improved sustainability and amenity for the community.

Indirect benefits

- create a step-change in the Australian freight network
- be a catalyst for growth
- provide benefits for metropolitan and regional areas
- be an enabler of complementary market-driven investments.

Local community benefits

- employment
- business opportunities
- traffic incident reduction
- environmental externalities
- road decongestion.

The Proponent

ARTC was created in 1997 as a 'one stop shop' for all operators seeking to access the national interstate rail network. ARTC plays a critical role in the supply chain by managing and maintaining 8,500 kilometres of rail network across five states, and investing in building, extending and upgrading the rail network to get freight off the road and onto rail.

As the operator and manager of Australia's national rail freight network, ARTC has successfully delivered more than $5 billion in capital upgrades to the national rail freight network. ARTC has been tasked with developing a program to deliver Inland Rail under the guidance of the Department of Infrastructure, Transport, Regional Development and Communications (DITRDC), formerly the Department of Infrastructure, Regional Development and Cities.

> The ARTC network moves commodities including general freight, coal, iron ore, other bulk minerals and agricultural products—supporting industries and businesses that are vital to Australia's economy.


GATTON
BRISBANE
HELIDON
CALVERT
GOWRIE
ACACIA RIDGE
KAGARU
BROMELTON
TOOWOOMBA
NSW/QLD BORDER
GOONDIWINDI
INGLEWOOD
YELARBON
NORTH STAR
NSW/QLD BORDER
MOREE
NARRABRI
BINNAWAY
GILGANDRA
NARROMINE
DUBBO
PARKES
FORBES
STOCKINBINGAL
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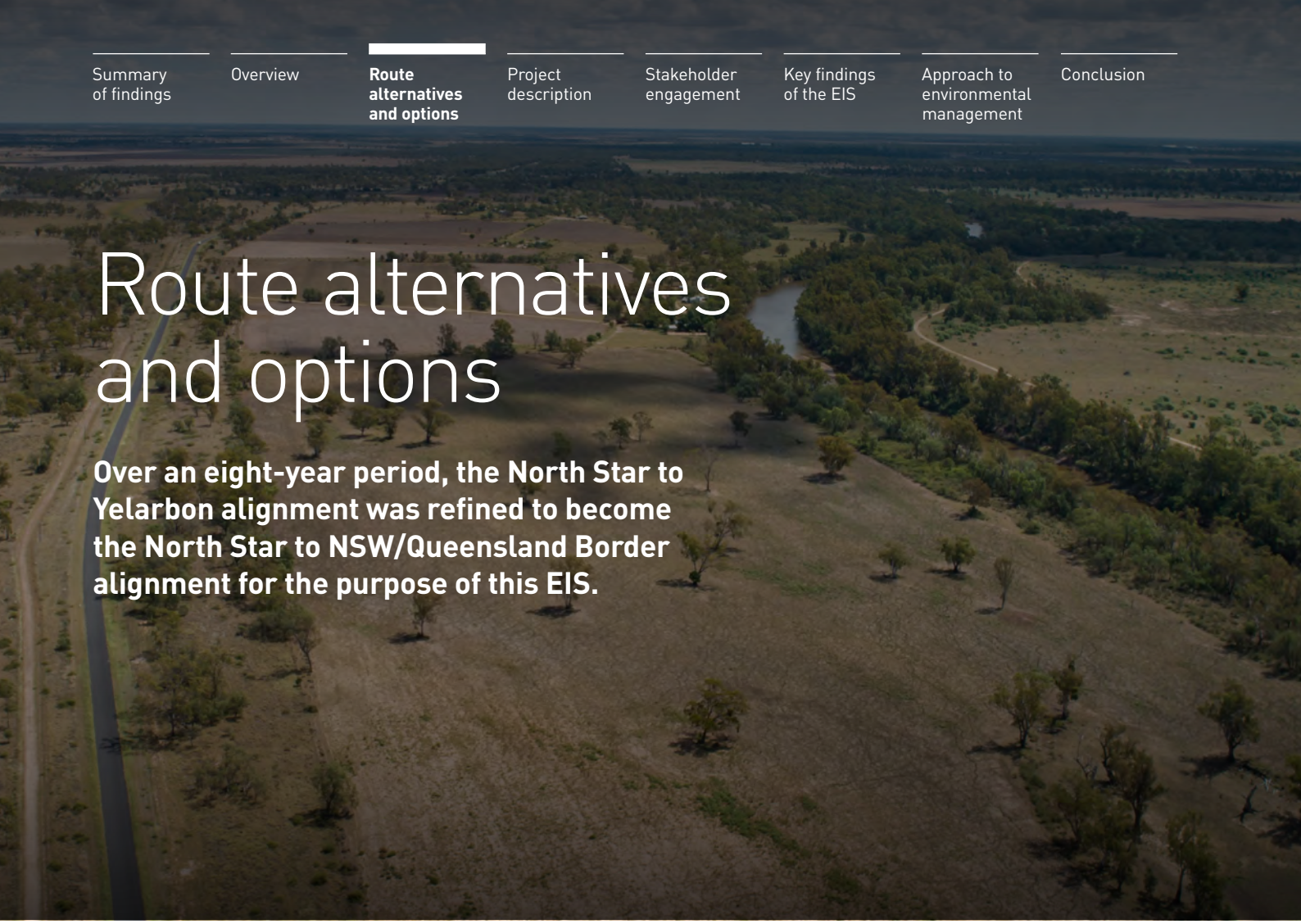
WAGGA WAGGA
ALBURY
WODONGA
SEYMOUR
BEVERIDGE
TOTTENHAM
MELBOURNE



Route alternatives and options

Over an eight-year period, the North Star to Yelarbon alignment was refined to become the North Star to NSW/Queensland Border alignment for the purpose of this EIS.

The Melbourne–Brisbane Inland Rail Alignment Study was a broad assessment of the preferred route between Melbourne and Brisbane.

Previous studies

Previous studies and investigations have considered alternatives to the Inland Rail Program, including progressive road upgrades for road freight, maritime shipping, air freight, or other rail solutions such as upgrading the existing east coast railway.

Overall, constructing an inland railway was the preferred option.

Alternative routes for Inland Rail were considered in:

- *North–South Rail Corridor Study* (Department of Transport and Regional Services 2006)
- *Melbourne–Brisbane Inland Rail Alignment Study (ARTC 2010)*

The *Inland Rail Route History 2006–2019* can be found on the Inland Rail website at **inlandrail.com.au**

To deliver Inland Rail, ARTC divided the Melbourne–Brisbane alignment into 13 projects.

Want to know more?

See

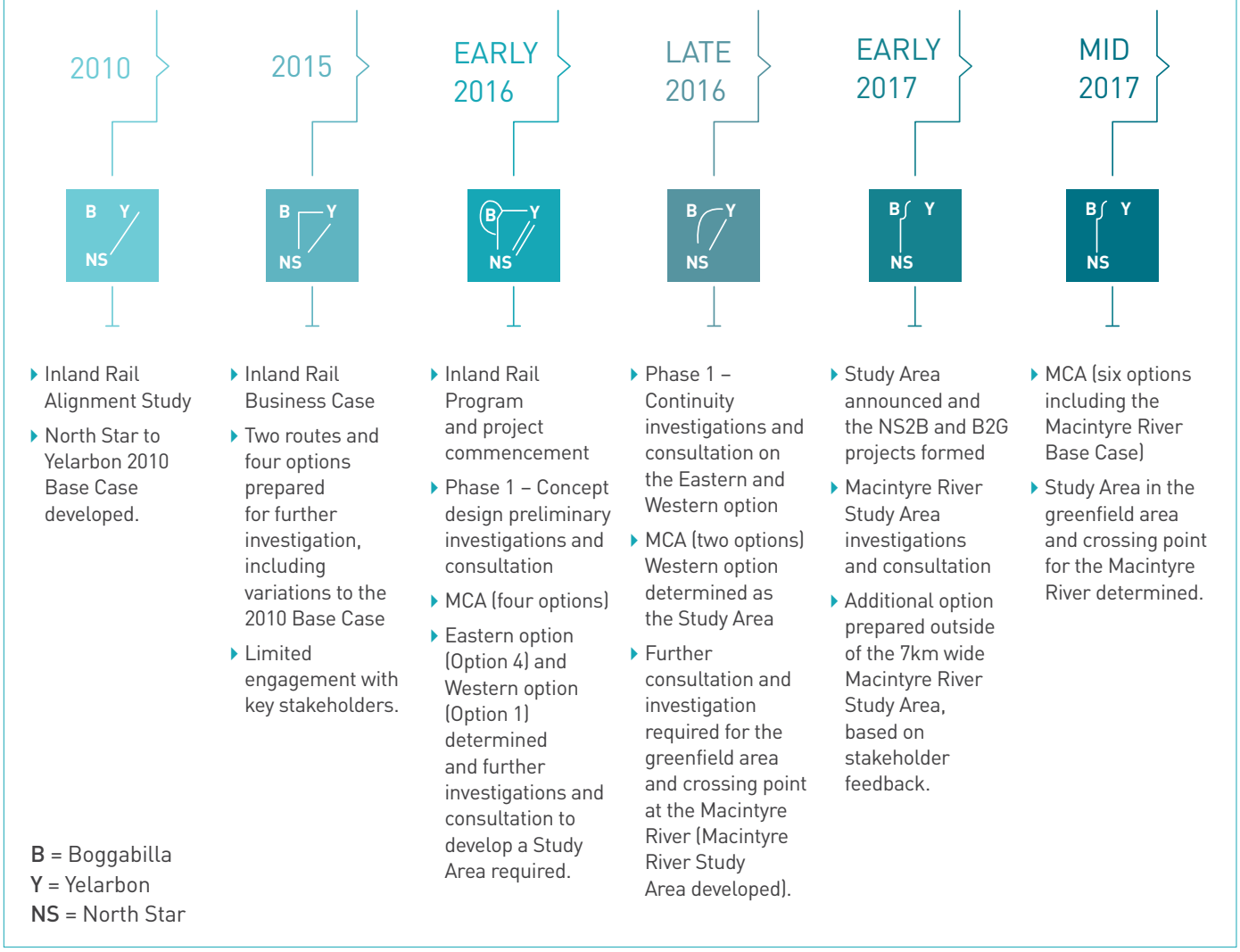
- **Chapter 3: Alternatives and Proposal Options**
- **Appendix D: ARTC Consultation Summary**

of the Environmental Impact Statement

Alternative locations and route options for the Project

To deliver Inland Rail, ARTC divided the Melbourne–Brisbane alignment into 13 projects.

A brief history of the alignment development for the North Star to NSW/Queensland Border Project is shown below:



NORTH STAR TO NSW/QUEENSLAND BORDER PROJECT HISTORY, 2010-2017

2010 Melbourne–Brisbane Inland Rail Alignment Study

This was a broad assessment of the preferred route between Melbourne and Brisbane. The study proposed two route options between North Star and Yelarbon, including:

- **Eastern option** – a relatively direct, greenfield route between North Star and Yelarbon, approximately 64.5 kilometres in length
- **Western option** – a predominantly brownfield route, approximately 72 kilometres in length, that utilises a section of the existing non-operational Boggabilla rail corridor through Boggabilla and Kildonan.

The *Melbourne–Brisbane Inland Rail Alignment Study* recommended the Eastern option be carried forward as the base case alignment for North Star to Yelarbon (and later North Star to NSW/Queensland Border). This was due to the Western option having higher direct costs associated with upgrading existing infrastructure on the Boggabilla rail line and longer travel times.

2015 Alignment Development Assessment Report

In 2015, ARTC commissioned a review of the North Star to Yelarbon route, considering new and changing constraints. Due to stakeholder and community interest in the Project, it was recommended additional alignment options between North Star and Yelarbon be investigated.

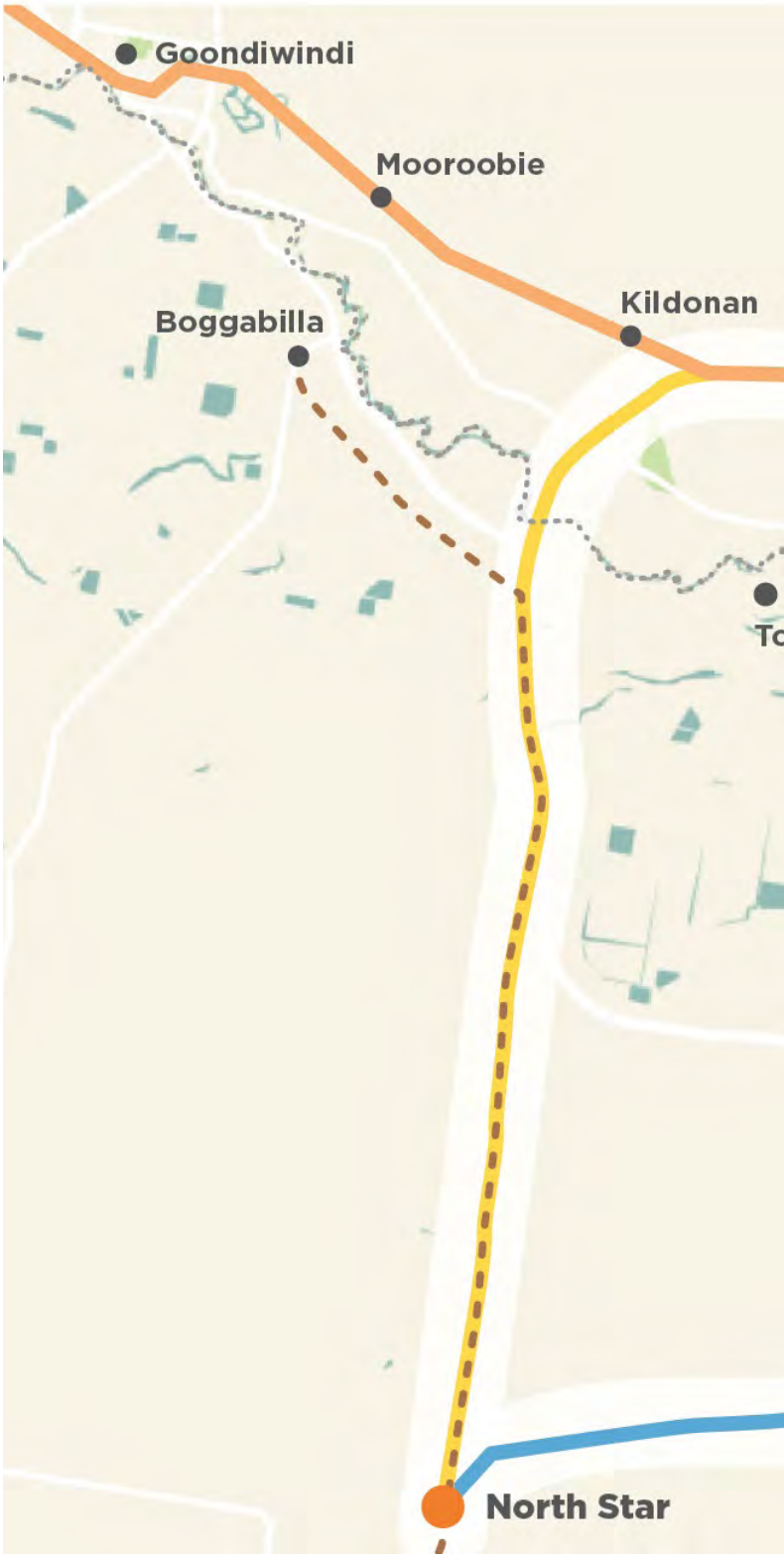
Drivers for investigating additional alignment options included:

- minimising impacts on existing land uses, including Dthinna Dthinnawan National Park, Bebo State Forest, Yelarbon Desert, travelling stock reserves and Crown Land
- minimising land take by utilising the existing non-operational Boggabilla rail corridor and connecting to the existing Queensland Rail South West Rail line
- minimising the length of track across the Macintyre River and Dumaresq River floodplains
- minimising the number and length of structures (e.g. bridges, culverts and embankments) required
- moving the alignment closer to potential sources of fill
- moving the alignment closer to Goondiwindi, with the intent of providing economic development and revenue streams for Goondiwindi.

The two options under investigation were the Eastern option referenced above, with some refinements, and an option which used part of the existing non-operational rail line between North Star and Whalan Creek, but came closer to Goondiwindi and connected to Queensland Rail's South West Rail Line before Yelarbon. This option was known in the 2015 report as the Western option. A two-kilometre-wide study area was developed for each option indicated in the figure opposite.

A multi-criteria analysis (MCA) was used to compare the two options. The following criteria were considered:

- **technical viability** – impact on utilities, services and existing road and rail networks, geotechnical conditions, flood immunity, future proofing
- **safety** – construction, operational and public safety, road rail interfaces, emergency response capabilities
- **operations** – impact on travel time, reliability, availability, interoperability and connectivity
- **environment** – ecological, visual, noise, vibration, air quality, flooding and waterway impacts, greenhouse gas emissions
- **community and property** – community, property and cultural heritage impacts, effect on current and future land



- **approvals and risk** – support from local, state and federal governments, planning and approval timeframes, other statutory and regulatory approval considerations.

EASTERN AND WESTERN OPTIONS FROM THE 2015 ALIGNMENT AND DEVELOPMENT ASSESSMENT REPORT

Based on information available at the time of the *2015 Alignment Development and Assessment Report*, the outcome of the MCA was that both options should undergo further investigation during 2016 prior to confirming a final alignment.

Early 2016 Concept Assessment Study

This study progressed the findings of the *2015 Alignment Development Assessment Report* in which two alignment corridors were identified. The study accepted the Eastern alignment corridor as the Base Case, simply because it was the corridor assessed in the *2010 Inland Rail Alignment Study* due to it being the most direct route between North Star and Yelarbon. A second corridor was identified as the Western alignment corridor.

However, with the information available at the time of this study and with the limited amount of stakeholder and community engagement, the MCA procedure was unable to identify a single preferred alignment corridor. Consistent with this outcome, the study report recommended the two alignment corridors progress for further study as Base Case East and Base Case West.

This recommendation of the addition of a Western corridor was the result of the study identifying strong community support for the benefits of the rail passing closer to the local communities. It also allowed each base case to be independently studied for alignment options within each corridor.

Late 2016 Continuity Alignment Study

In keeping with the 2016 concept recommendation, the purpose of the *Continuity Alignment Study* and subsequent MCA was to provide increased scope certainty in Phase 2 and also provide more certainty to the community on the likely project impacts. It required further development and analysis of the Western and Eastern options independently.

ARTC conducted preliminary investigations including engineering, flooding, cultural heritage, geotechnical and ecological field visits, desktop studies and extensive consultation with local landowners, industry groups and councils including Goondiwindi Regional Council, Moree Plains Shire Council and Gwydir Shire Council. This information informed an MCA process in April 2016 and November 2016.

The report confirmed that due to community feedback, Option 2 from the *2016 Phase 1 Concept Assessment* MCA was reintroduced into this study for further analysis, along with two other shorter variants of the Western alignment that deviated towards Boggabilla and Goondiwindi.

The key outcome from this Phase 1 study was to select the Western corridor, with the recommendation that further alignments at the crossing of the Macintyre River should be investigated.

EASTERN AND WESTERN ALIGNMENT OPTIONS FROM THE 2016 PHASE 1 CONCEPT ASSESSMENT

Early 2017 route selection

In February 2017, the Australian Government announced the Western option as the preferred option. The study area for the preferred option follows the non-operational rail line towards Boggabilla and then crosses the Macintyre River before joining Queensland Rail's South West Rail Line. At this time, the Project was refined to become the North Star to NSW/Queensland Border Project.

Mid-2017 Preparatory Alignment Assessment Report

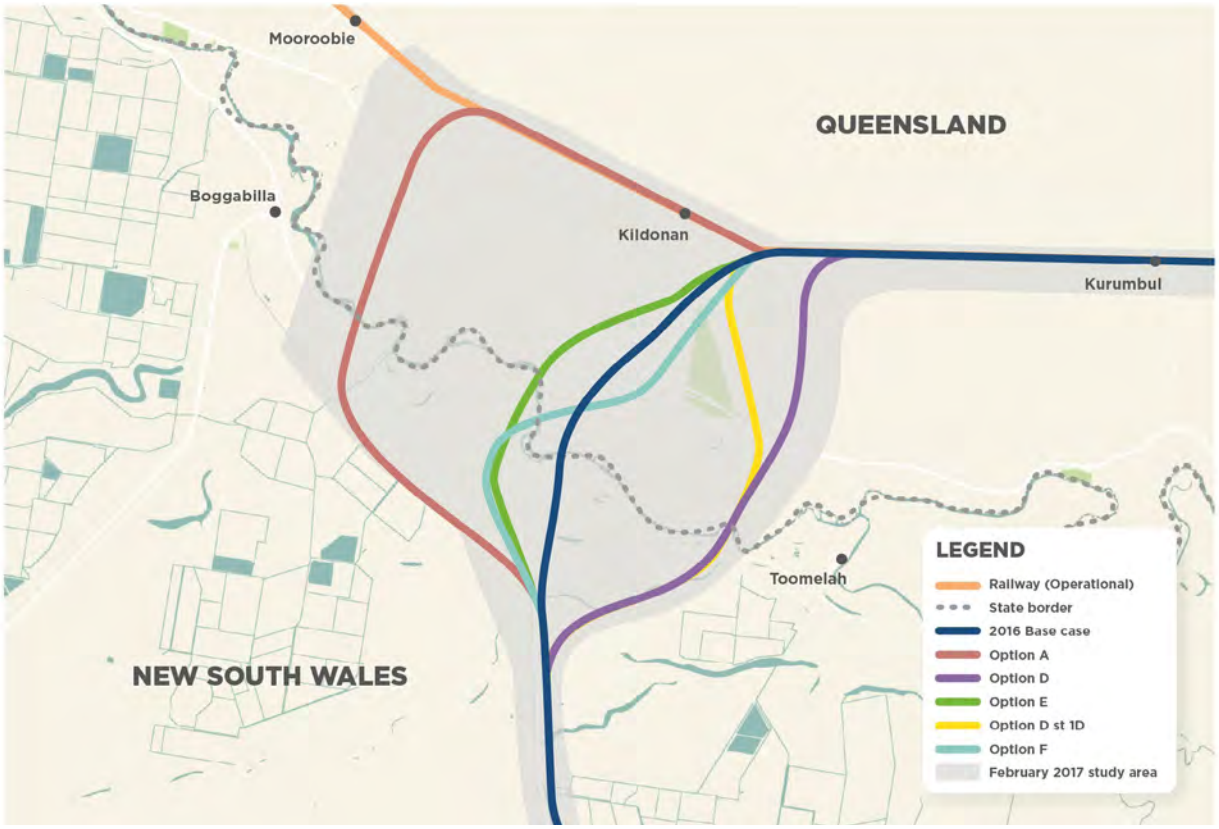
After the announcement, further consultation and studies were conducted between February 2017 and May 2017 to help determine the most appropriate place to cross the Macintyre River and link with the South West Rail Line east of Goondiwindi. This work informed a third MCA which determined the preferred study area for the area between Whalan Creek and the South West Rail Line. The routes investigated are shown in map below.

Despite some of the options having previously been analysed, the MCA did not delete any previously considered options. Rather, the four western corridor options considered in the previous study were further developed and two new options were added, resulting in the MCA for this study analysing six options, as illustrated in the table above.

OPTION DESCRIPTOR	PHASE 1 CONTINUATION	PHASE 2 PREPARATORY
2016 Base Case West	✓	✓
Option A	✓	✓
Option D	✓	✓
Option D1	×	✓
Option E	✓	✓
Option F	×	✓

The additional Option D1 was added as a variation of Option D due to the incorporation of community feedback, with some property impacts reduced. The additional Option F was added as a variation to the 2016 Base Case West with an alternative to the Macintyre River crossing in response to additional engineering. The consequential focus of Option F was flood mitigation and road diversions.

The key outcome from this Phase 2 *Preparatory Alignment Assessment* study was to select a single alignment, Option D1, to proceed to reference design.



GREENFIELD ALIGNMENT OPTIONS FOR THE NORTH STAR TO NSW/QUEENSLAND BORDER SECTION OF INLAND RAIL

2018 State Significant Infrastructure Scoping Report

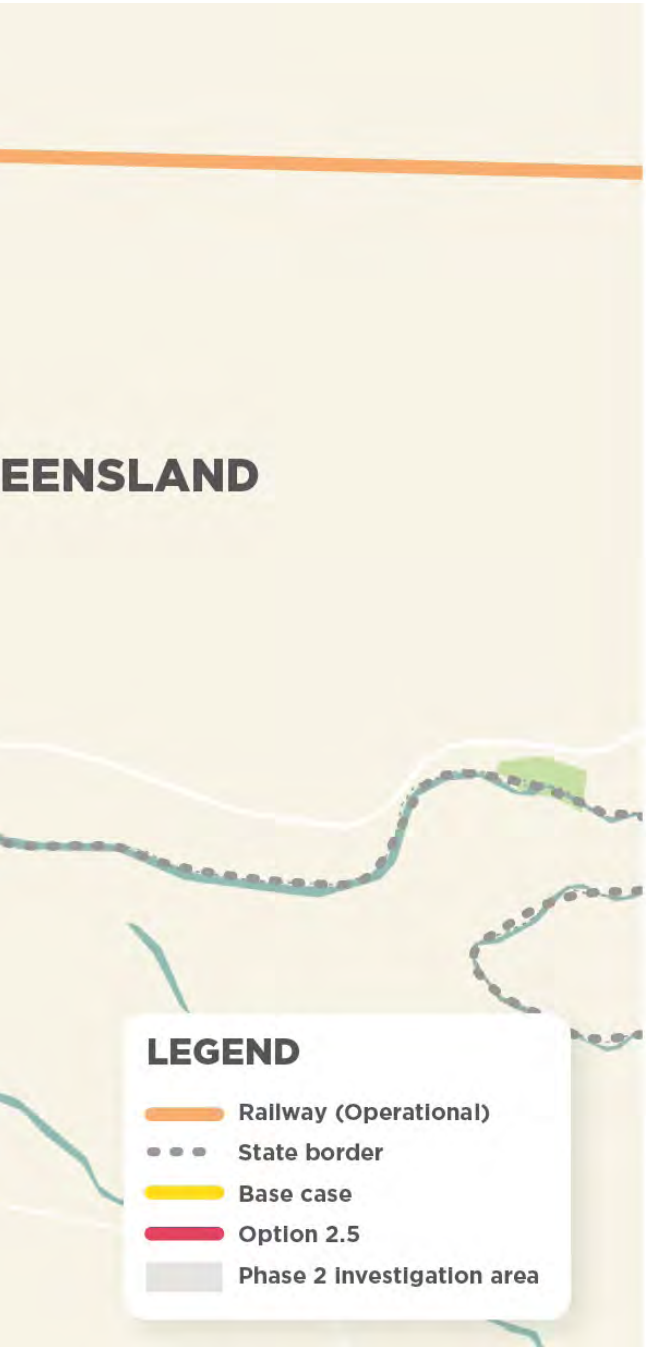
In May 2018, ARTC submitted the *State Significant Infrastructure Scoping Report* which identified an investigation corridor to progress the reference design and environmental investigational studies.

It was identified earlier that further refinement investigations were required as part of the environmental impact assessment due to potential flooding constraints associated with crossing the Macintyre River and potential property severance issues. The proposed investigation corridor therefore included a broader corridor at the NSW/Queensland border, indicated in the figure below, to allow for an optimal alignment to be refined during the reference design process.

By November 2018, ARTC had completed the initial flood modelling of the Macintyre River floodplain, which also incorporates other rivers and catchments, and progressed the design of structures to cross the floodplain with minimal impact on landowners.

PREFERRED ALIGNMENT FOR PHASE 2 REFERENCE DESIGN

A 100-metre-wide focused area of investigation for the Macintyre River crossing was identified as a key outcome of this work. **Option 2.5** indicated in the figure below is the reference design alignment that has been chosen to inform the EIS and undertake relevant investigations.



Early 2019 MCA revalidation

Throughout 2019, ARTC undertook extensive engagement with local stakeholders and investigations to further refine the Project alignment and complete the development of the reference design. During consultation, stakeholders indicated Option A had not been assessed correctly during the *2017 Preparatory Alignment Assessment Report.*

ARTC ensured all MCAs were publicly available and commissioned a compliance review of all MCAs undertaken on the Project's route selection. The review found all reports described the options assessment and MCA procedure in detail and demonstrated adherence to the MCA procedures.

2019/2020 Alignment D1 and Alignment A developed comparison

The Macintyre River flood model was developed, calibrated and validated with 2019 LiDAR (which stands for light detection and ranging, a method for measuring distances) topographical survey through the reference design phase.

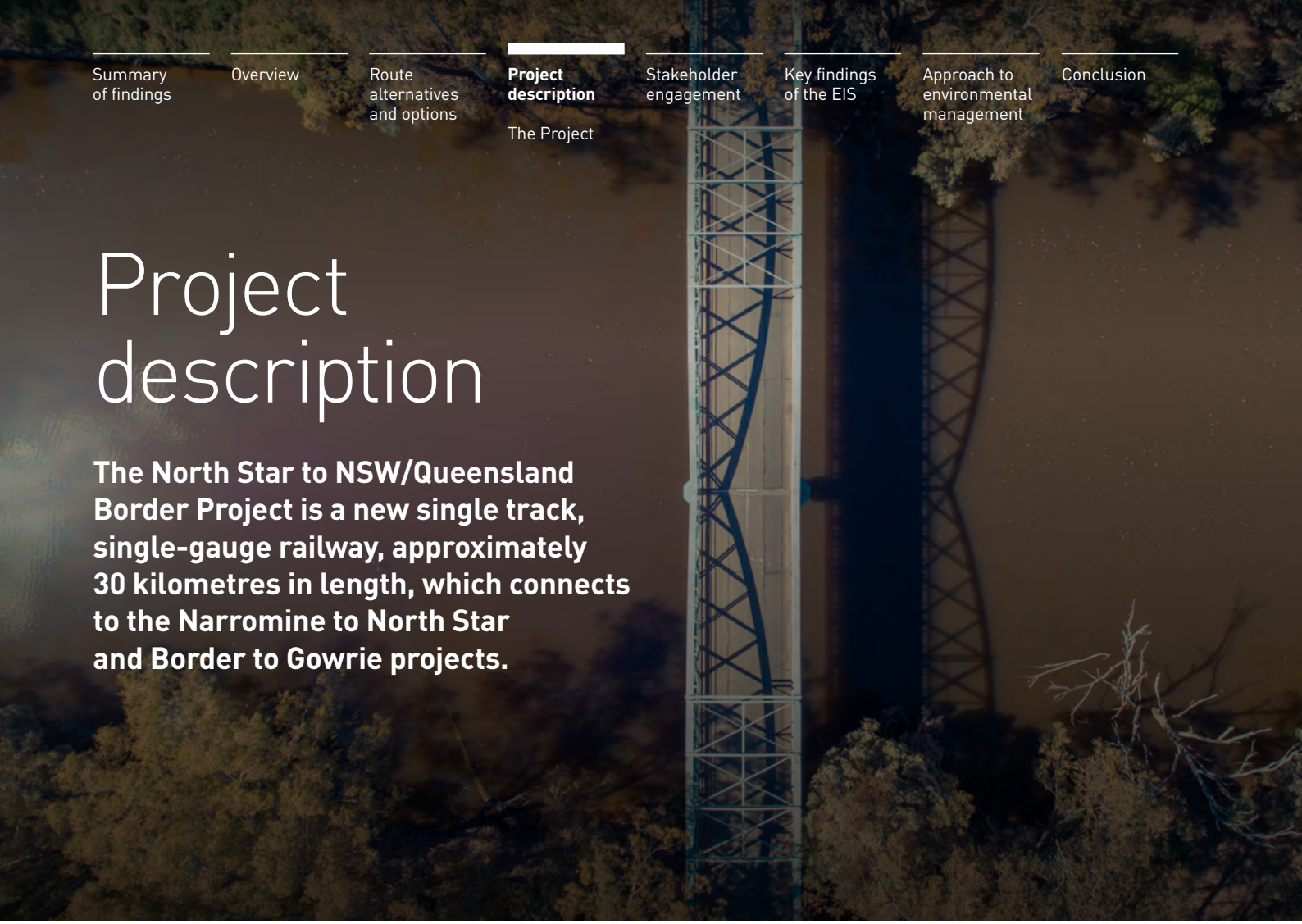
During its development, stakeholders requested that Alignment A, which was not selected as the preferred alignment in the *2017 Preparatory Alignment Assessment Report*, be revisited.

ARTC migrated the base engineering design and assumptions from Alignment D1 to Alignment A in order to understand the potential impacts of Alignment A when validated against the updated Macintyre River flood model.

Alignment A was developed for use with the *Border Rivers Valley Floodplain Management Plan* topographical layers, historical 2015 LiDAR and the latest 2019 LiDAR.

A key outcome of this activity was that by maintaining the same level of flood immunity the direct cost differential between Alignment A and D1 increased substantially from the original 2017 cost comparison in all scenarios tested. This was due to Alignment A being 10 kilometres longer, with more of the alignment located in the floodplain. Hence the option required a greater quantity of fill, as well as increased bridge and culvert infrastructure.

For more information on the consultation undertaken during the alignment refinement please refer to **Appendix D: ARTC Consultation Summary.**



Project description

The North Star to NSW/Queensland Border Project is a new single track, single-gauge railway, approximately 30 kilometres in length, which connects to the Narromine to North Star and Border to Gowrie projects.

The Project consists of approximately 30 kilometres of new track and associated facilities between North Star and the NSW/Queensland border.

The Project

ARTC is seeking approval to construct and operate the North Star to NSW/Queensland Border Project of Inland Rail.

The Project consists of approximately 30 kilometres of new track and associated facilities between North Star and the NSW/Queensland border. For design purposes, the delivery model for the Project includes a seven kilometre section of new track north of the NSW/Queensland border that ties into the existing Queensland Rail South Western Line near Kurumbul in Queensland.

To obtain the necessary environmental approvals, this seven kilometre section of new track will be assessed as part of the Border to Gowrie Project, for which a separate EIS under the Queensland *State Development and Public Works Organisation Act 1971* is currently being prepared.

Location

From a point approximately 900 metres north of North Star, the Project follows the existing non-operational Boggabilla rail corridor for around 25 kilometres towards Whalan Creek. The Project then continues along a five kilometre section of greenfield rail corridor towards the NSW/Queensland border. The NSW/Queensland border is defined as the centrepoint of the Macintyre River.

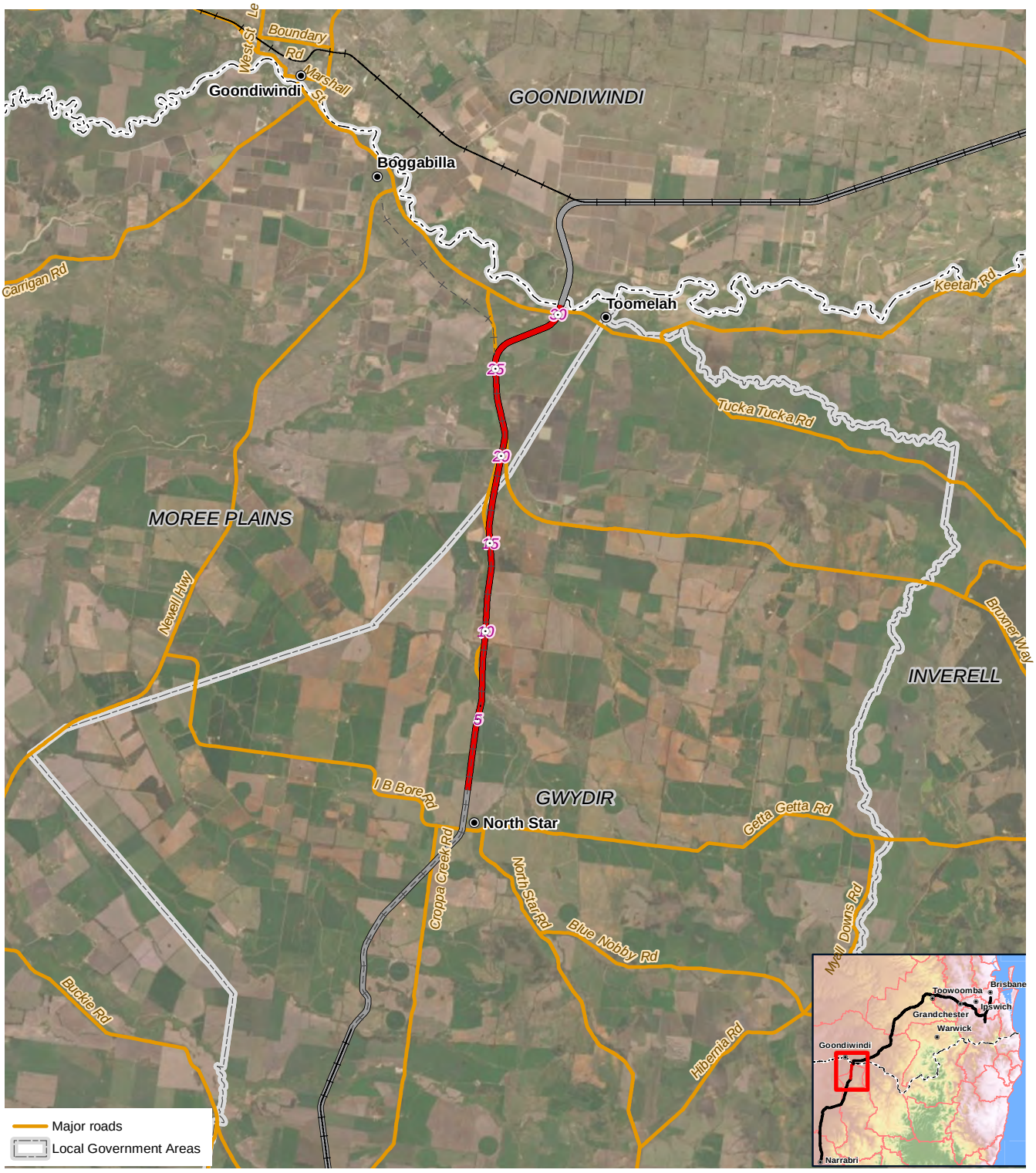
The rail corridor for the Project will have a general width of 40 metres with some variation to cater for local topography and certain pieces of infrastructure. The rail corridor will be of sufficient width to construct all infrastructure currently proposed, as well as possible expansions in the future.

Want to know more?

See

- **Chapter 4: Site Description**
- **Chapter 6: The Proposal**
- **Chapter 7: Construction of the Proposal**

of the Environmental Impact Statement



NORTH STAR TO NSW/QUEENSLAND BORDER PROJECT

The location of the Project is shown in the figure above. Further information about the location of the Project and a description of the site can be found in **Chapter 4: Site description.**

TUCKA TUCKA ROAD, LOOKING NORTH EAST

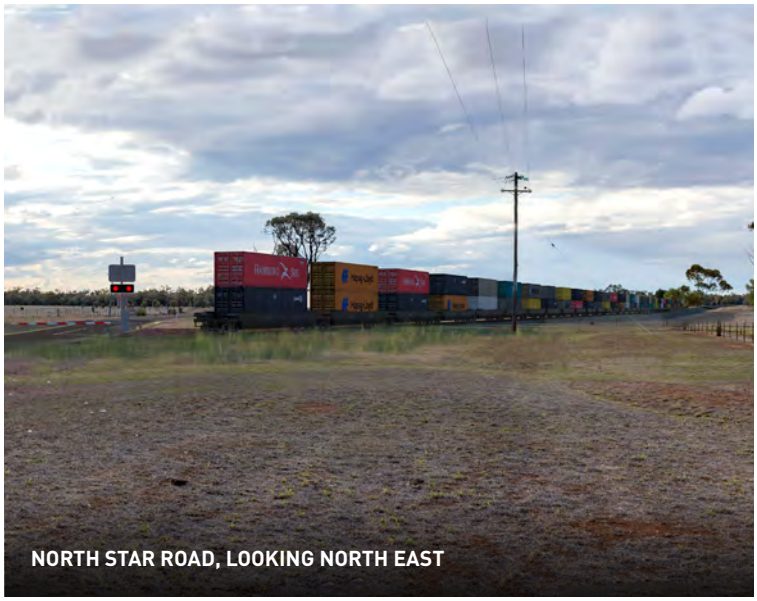
BRUXNER WAY, LOOKING EAST

Key features of North Star to NSW/Queensland Border Project

The Project consists of the following key features:

- 25 kilometres of new track within the existing, non-operational Boggabilla rail corridor
- approximately five kilometres of new track within a greenfield rail corridor
- one crossing loop designed to accommodate trains up to 1,800 metres long
- 11 new bridges, including an approximately 1,800-metre-long viaduct over the Macintyre River and Whalan Creek, which are major watercourses
- work on new and existing level crossings
- earthworks, drainage works and road works
- ancillary infrastructure including signalling and communications infrastructure, signage, fencing and utilities.

The viaduct is located in both NSW and Queensland, therefore it will be assessed under the NSW *Environmental Planning and Assessment Act 1979* by the North Star to NSW/Queensland Border Project EIS, and under the Queensland *State Development and Public Works Organisation Act 1971* by the Border to Gowrie Project EIS.



NORTH STAR ROAD, LOOKING NORTH EAST

> The Project consists of 11 new bridges, including an approximately 1,800-metre-long viaduct over the Macintyre River and Whalan Creek, which are major watercourses.

Disclaimer: Project 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.

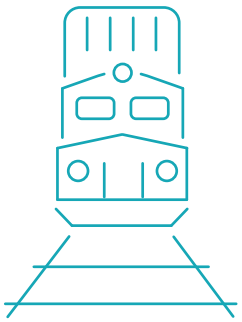
Timing and operation

Subject to approval of the Project proposal, construction is planned to occur between 2021 and 2025, with the line managed and maintained by ARTC. However, train services will be provided by a variety of operators. Train services are not expected to commence until all 13 sections of Inland Rail are complete. This is planned for 2025.

2025

14 trains per day

transporting **12 million** tonnes per year



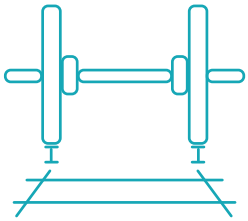
2040

21 trains per day

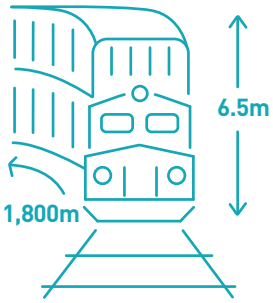
transporting **20 million** tonnes per year

The Project is designed to support double-stacked, 21–25 tonne axle load intermodal (i.e. container) trains up to 1,800 metres long and 6.5 metres high.

double-stacked containers



21–25 tonne axle loads

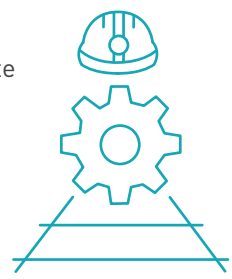


up to **1,800 metres** long and **6.5 metres** high

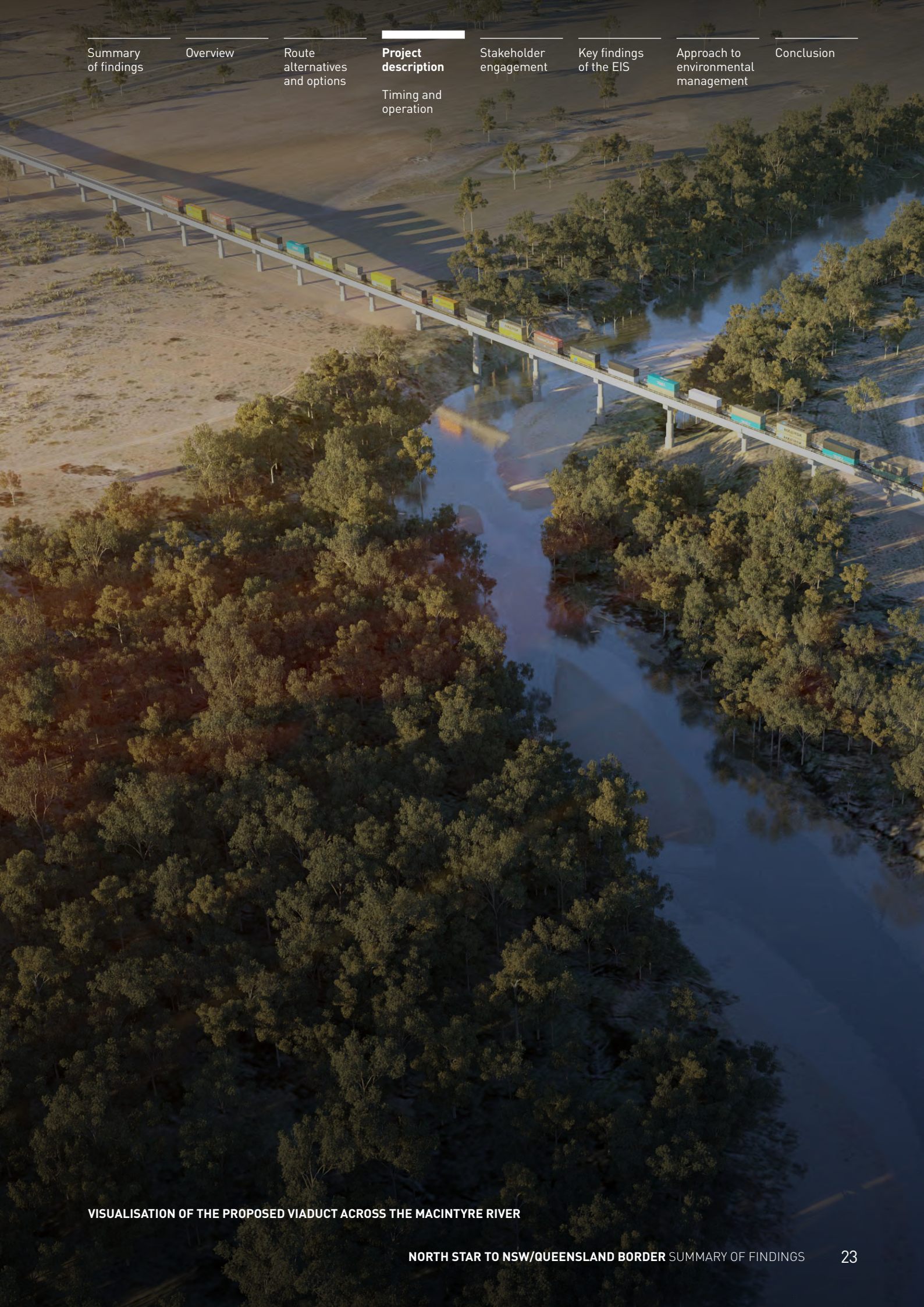
Depending on the tonne axle load, train speeds will vary between 80 kilometres per hour (km/hr) and 115km/hr.

80km/hr to 115km/hr speeds

In addition, the Project footprint is **future-proofed** to accommodate 30 tonne axle load intermodal trains up to 3,600 metres long and 6.5 metres high, travelling at 80km/hr.



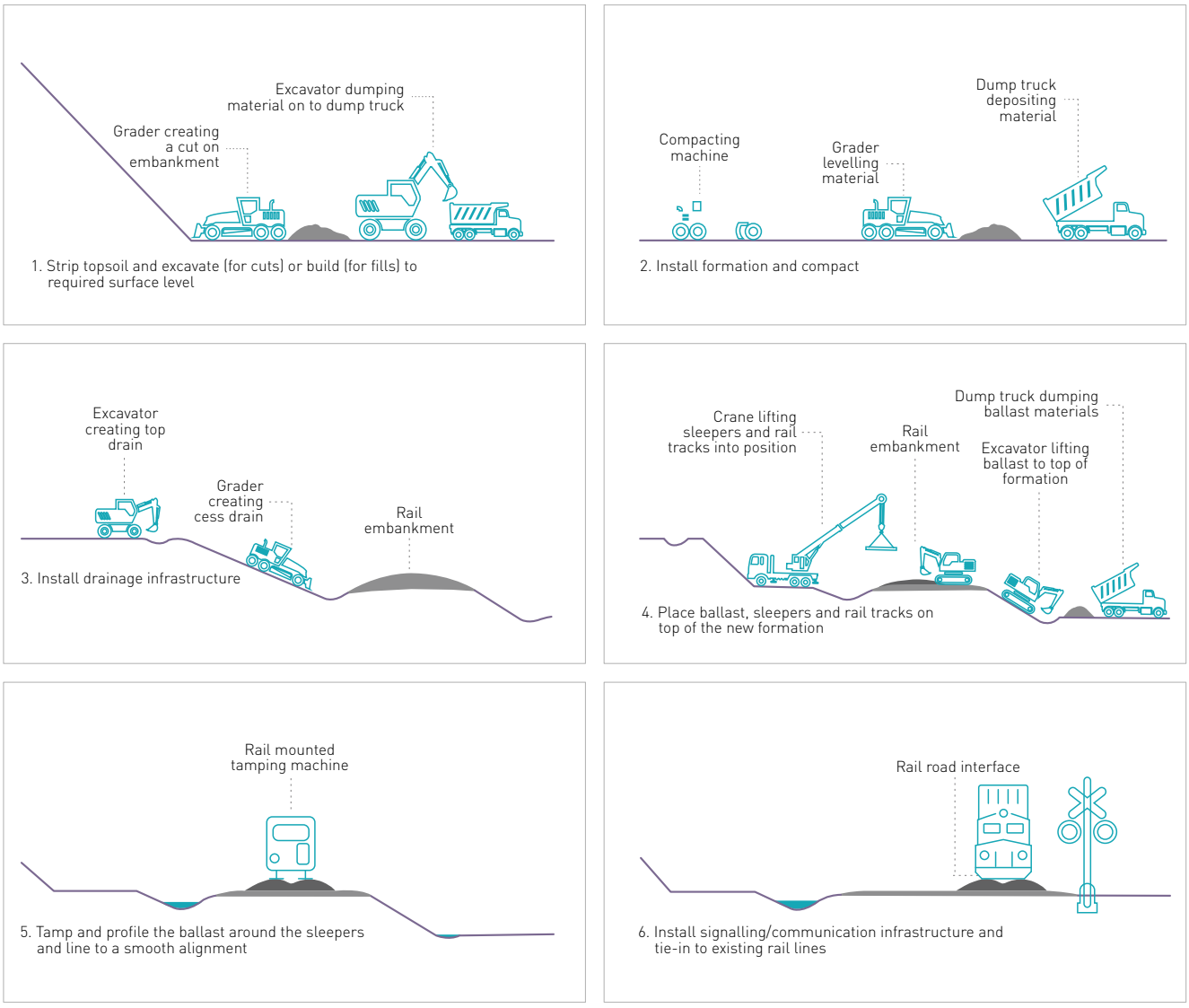
30 tonne axle load intermodal trains
3,600 metres long
6.5 metres high
travelling at **80km/hr**



VISUALISATION OF THE PROPOSED VIADUCT ACROSS THE MACINTYRE RIVER

Constructing rail infrastructure

Main line track works include foundation, formation and track works. The following diagram shows typical activities undertaken in the lead up to and during construction. Impacted residents and stakeholders will be notified in advance of construction activities and impacts will be minimised through ongoing environmental monitoring and management.



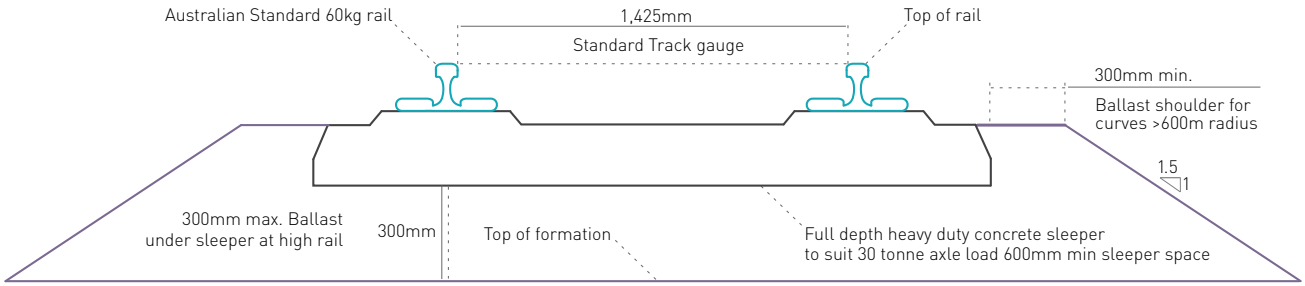
TYPICAL CONSTRUCTION ACTIVITIES FOR TRACK WORKS

Construction activities and impacts will include:

- establishment of access tracks, laydown areas and site offices
- construction work hours between 6.30am and 6.00pm, Monday to Sunday
- 11 borrow pit sites identified for general and structural fill for embankments
- construction accommodation
  - peak construction workforce of approximately 350 people
  - potentially used by Narrabri to North Star Project and North Star to NSW/Queensland Border Project
  - used between 2020–2024 (North Star to NSW/Queensland Border Project = 2021–2025).

Track design

The proposed new railway in the NSW section of the Project is designed to support up to 30 tonne axle loads and will consist of 60 kilograms/metre steel rail installed at the standard gauge track spacing of 1,435 millimetres.
The track will be supported by heavy duty concrete sleepers at 600 millimetre spaces, resting on an approximately 300 millimetre thick bed of ballast rock.



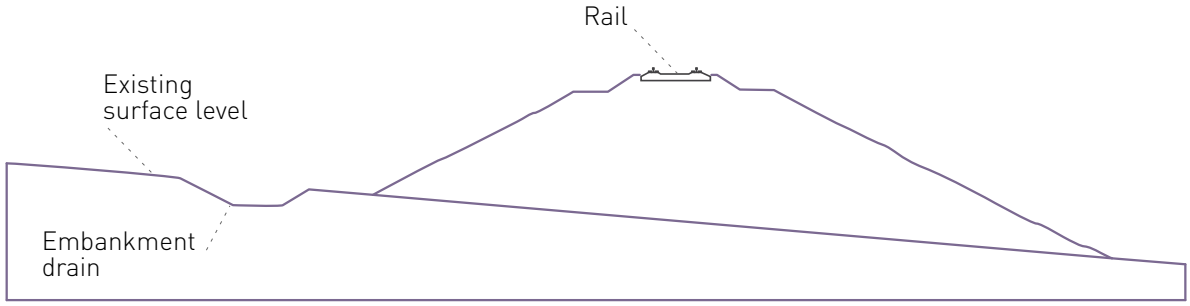
TYPICAL TRACK FORMATION CROSS SECTION (STANDARD GAUGE)

Track drainage

Two types of track drainage are currently proposed:

1. embankment drains are proposed within the permanent footprint, adjacent to the track
2. catch drains are proposed within the permanent footprint, on the uphill side of cuttings.

Due to topographical constraints, track drainage is not required along the entire length of the alignment. Rather, track drainage is proposed at specific locations along the proposed alignment where the gradient is steep enough to divert surface runoff to the nearest bridge or culvert location.

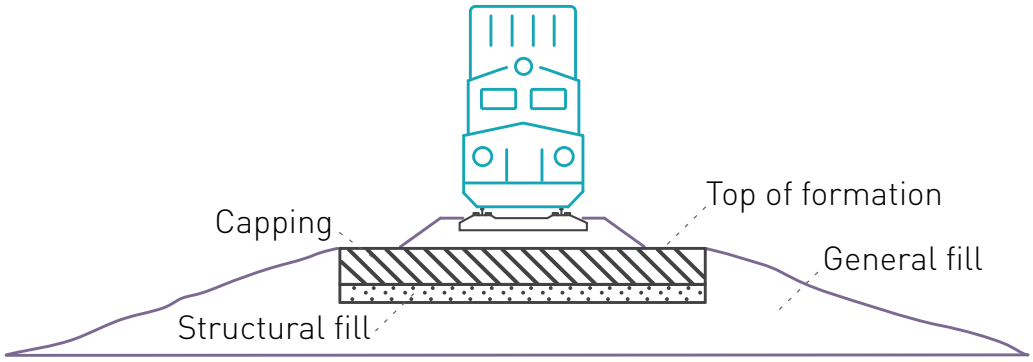


INDICATIVE EMBANKMENT DRAIN DESIGN

Embankment design

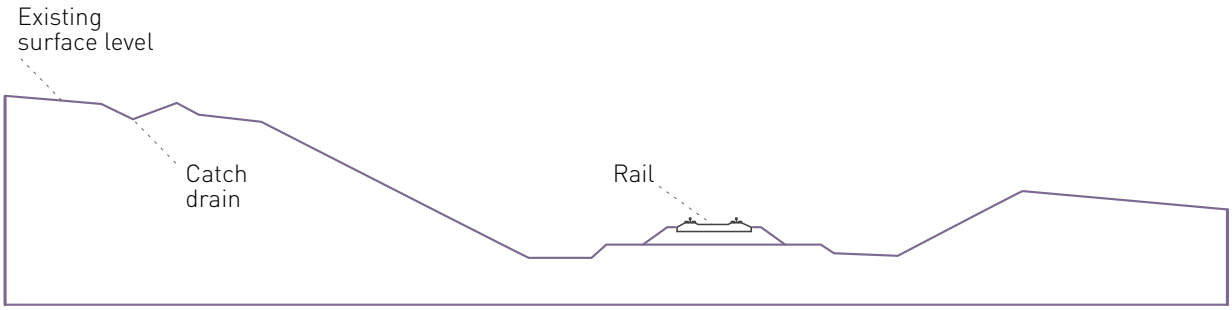
The track will be supported by an earth embankment made up of general fill and engineered gravels.
In some cases, where low strength or highly reactive soils exist below the proposed embankment, some earth may need to be removed and replaced with better material or suitably treated to ensure the rail is built on a sound foundation. The embankments for the Project are mostly two metres high, but can be up to 7.5 metres high due to site environmental requirements.

REPRESENTATIVE EMBANKMENT HEIGHT (2 METRES HIGH)

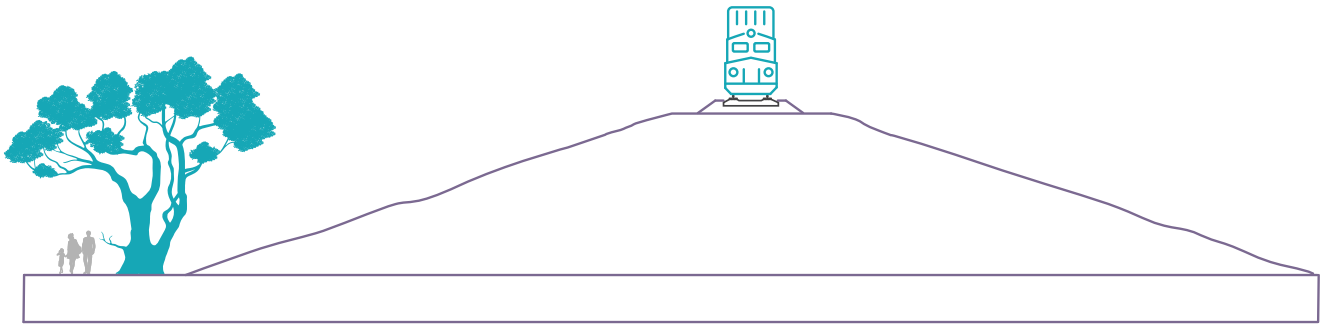


STRUCTURE OF THE FORMATION AND EMBANKMENT

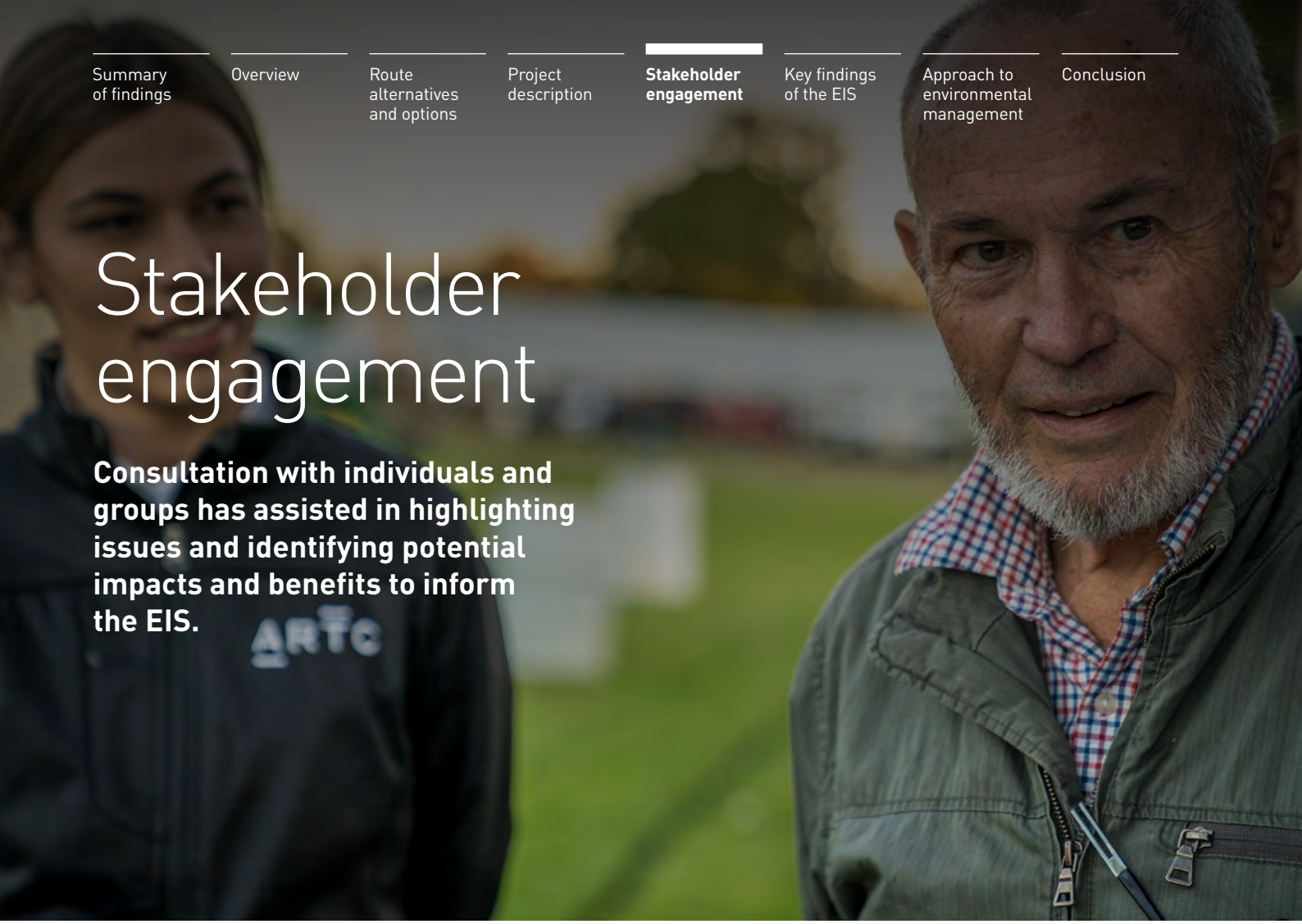
As with culverts, the design and location of track drainage will be refined during the detailed design phase in order to minimise potential impacts. Both types of track drainage may be lined with grass to prevent erosion.



INDICATIVE CATCH DRAIN DESIGN



REPRESENTATIVE EMBANKMENT HEIGHT (7.5 METRES HIGH)



Stakeholder engagement

Consultation with individuals and groups has assisted in highlighting issues and identifying potential impacts and benefits to inform the EIS.

The focus was on creating and sustaining meaningful relationships that meet the expectations of the diverse range of stakeholders, to be applied throughout planning and construction of the Project.

Stakeholder engagement

The Secretary's Environmental Assessment Requirements (SEARs) set the requirements for a comprehensive consultation program to identify broad issues of concern to local and regional community and interest groups, and address issues from Project planning through to construction, commissioning and operation.

Consultation with individuals and groups at workshops, community consultation sessions, via the Project's interactive online map, the North Star to NSW/Queensland Border Community Consultative Committee (CCC) and face-to-face meetings has assisted in highlighting issues and identifying potential impacts and benefits to inform the EIS. These interactions have also helped to shape the Project design and inform proposed mitigation measures for implementation in future stages of design, construction, commissioning and operation.

Major themes

- **the preferred alignment selection process**
- **proposed workers' accommodation**
- **Macintyre River flood model development (flood design limits)**
- **seven-day working roster**

Want to know more?

See

- **Chapter 8: Consultation**
- **Appendix D: ARTC Consultation**

of the Environmental Impact Statement

Overview of engagement

NORTH STAR COMMUNITY

- **4** drop-in sessions
- **50** homes door-knocked
- **100** homes letterbox dropped

LOCAL COUNCILS

- **114** emails
- **23** calls
- **42** face-to-face meetings

EMERGENCY SERVICES

- **2** workshops
- **28** attendees

IMPACTED LANDOWNERS

- **299** emails
- **124** calls
- **52** face-to-face meetings

LOCAL LAND SERVICES

- **7** emails
- **6** calls
- **4** face-to-face meetings

ABORIGINAL STAKEHOLDERS

- **70** emails
- **105** calls
- **22** face-to-face meetings

BROADER NSW AND QUEENSLAND COMMUNITY

- **10** information sessions
- **>150**
- **6** community consultative committee meetings
- **6** flood workshops

JULY 2018–JULY 2020

Engagement approach and communication tools

ARTC implemented a flexible and proactive engagement approach for the Project. The focus was on creating and sustaining meaningful relationships that meet the expectations of the diverse range of stakeholders, to be applied throughout planning and construction of the Project. A variety of communication and engagement activities have been, and will continue to be, developed to ensure all members of the community have access to up-to-date information and feel involved throughout all stages of the Project.

ARTC identified and carried out the following engagement approach using the International Association of Public Participation (IAP2) guiding principles and communication tools outlined below.

1 Identify

The key stakeholders for Inland Rail have been identified as:

- elected members of parliament of NSW, Queensland and Australia
- local councils
- government agencies
- landowners and residents with potential to be directly impacted
- community and environmental groups
- traditional owners
- utility providers
- representatives of neighbouring and related projects.

A range of potential impacts, both positive and negative, were identified including the potential for property acquisition, land-use and property impacts and access to properties.

2 Design and prepare

Four levels of engagement were tailored to each stakeholder group; they follow the IAP2 guiding principles:

1. **Inform:** create awareness amongst stakeholders and communicate progress
2. **Consult:** proactively seek feedback through formal and informal channels
3. **Involve:** consistently involve stakeholders and seek feedback
4. **Collaborate:** actively seek and incorporate all stakeholder feedback into the design.

STAKEHOLDER ENGAGEMENT APPROACH

3 Engage

The following engagement activities have been undertaken by Inland Rail:

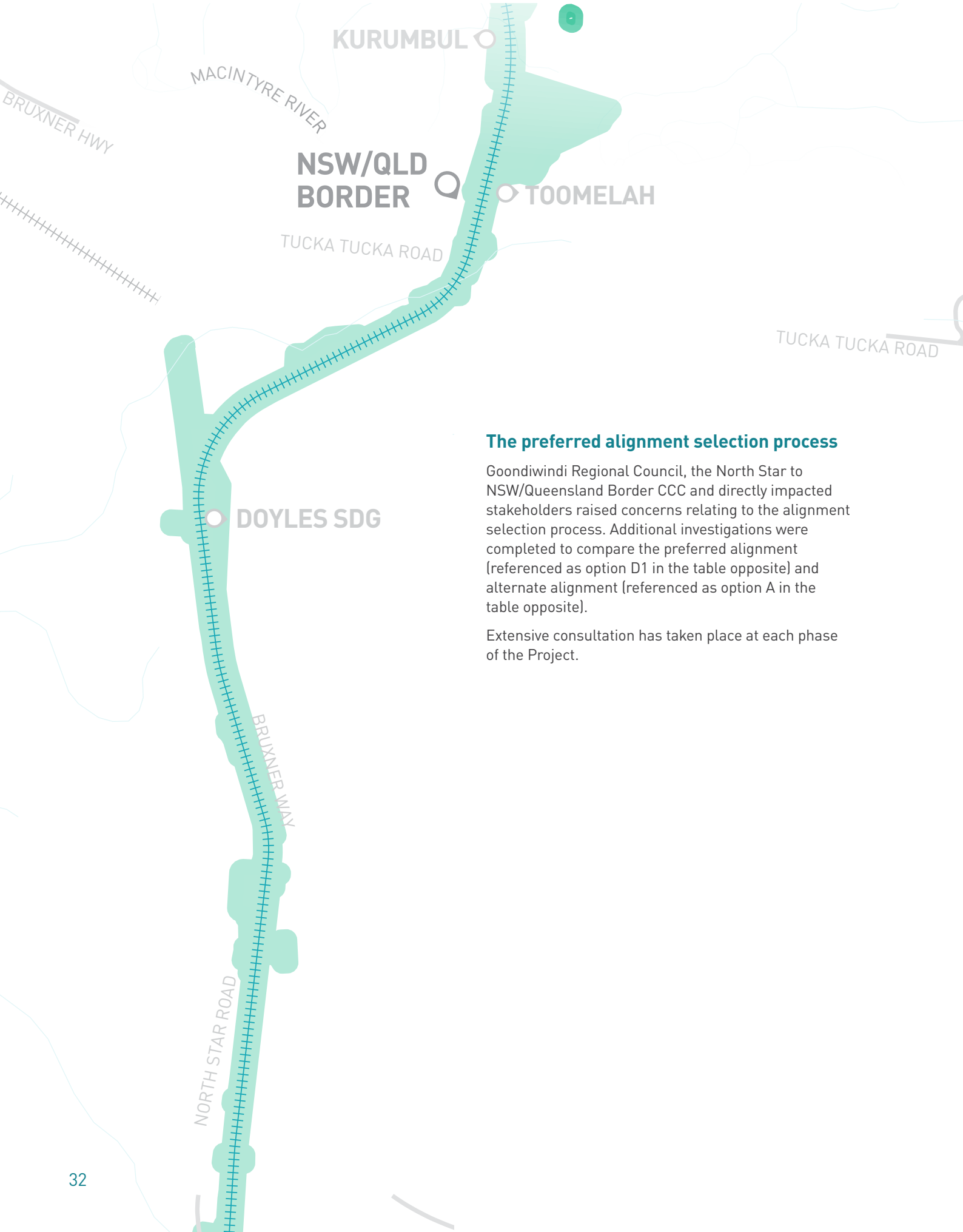
- community drop-in sessions
- feedback surveys
- doorknocks
- one-on-one meetings
- e-newsletters
- project factsheets
- regular website updates
- media releases
- workshops
- meetings
- presentations
- Community Consultative Committee
- ongoing consultation with key stakeholders
- letterbox drops.

4 Feedback

- Inland Rail maintained relationships to consistently seek feedback at all stages of the proposal
- the purpose to capture feedback during stakeholder engagement and to identify issues by stakeholder category is addressed throughout the chapter
- opportunities for future feedback will include the exhibition period for the North Star to NSW/ Queensland Border project.

5 Review

The intent of this phase is to enable Inland Rail to implement a continuous improvement loop to assess the adequacy and effectiveness of engagement and where required, change the nature of the engagement. This is evident through the implementation of workshops and drop-in sessions.



The preferred alignment selection process

Goondiwindi Regional Council, the North Star to NSW/Queensland Border CCC and directly impacted stakeholders raised concerns relating to the alignment selection process. Additional investigations were completed to compare the preferred alignment (referenced as option D1 in the table opposite) and alternate alignment (referenced as option A in the table opposite).

Extensive consultation has taken place at each phase of the Project.

TIMING AND ACTIVITY	TOPICS DISCUSSED	ISSUES RAISED/ FEEDBACK RECEIVED	ARTC RESPONSE
Phase 1	Route selection	▸ option A community preferred alignment ▸ community not consulted during route selection ▸ concerns around the MCA process	▸ ARTC undertook 6 face-to-face meetings, 3 community drop-in sessions, a Toomelah Local Aboriginal Land Council (LALC) meeting and 3 council meetings, during Phase 1 ▸ MCA Phase 1 route alignment strategy made publicly available on Project web page ▸ option D1 was selected through the ARTC MCA process ▸ option A was recognised as the preferred community alignment within the MCA
Scoping of EIS	Route refinement and baseline engagement	▸ option A community preferred alignment ▸ community not consulted during route selection ▸ concerns around the MCA process	▸ ARTC undertook 7 face-to-face meetings, 3 CCC meetings, 3 council presentations, 6 community drop-in sessions and a Toomelah LALC meeting during the preliminary Macintyre River crossing design phase ▸ alignment selection undertaken to minimise property severance ▸ 3 technical flood workshops ▸ flood immunity design criteria have driven reference design ▸ MCA Phase 2 route alignment strategy made publicly available on Project web page
EIS proposal alignment	Narrowing of corridor to Project boundary	▸ raised concerns around the economic impact between option A and the proposed alignment ▸ perceived flood impacts ▸ ongoing requests to investigate the community preferred alternate alignment ▸ impacts of the proposed alignment on neighbouring properties ▸ impacts to the Goondiwindi region's economic opportunities associated with Inland Rail as a result of the alignment selection ▸ concerns there is too much risk associated with the proposed alignment ▸ impact to the service offering and strong belief the proposed alignment will be more expensive to construct compared with the community preferred alignment	▸ ARTC undertook 7 face-to-face meetings, 3 community drop-in sessions, 3 technical flood workshops, 3 council presentations and 1 meeting with Toomelah LALC during reference design ▸ monthly e-newsletters distributed to share information about the MCA process and review, flood modelling updates, and technical documents available on Project web page ▸ CSIRO report available on the Inland Rail website

OVERVIEW OF ALIGNMENT SELECTION STAKEHOLDER ENGAGEMENT ACTIVITIES

Macintyre River floodplain model development

Flooding impacts continue to be a significant community concern, specifically the crossing of the Macintyre River floodplain. Extensive consultation relating to the Macintyre River floodplain model development has taken place at each stage of the Project.

TIMING AND ACTIVITY	TOPICS DISCUSSED	ISSUES RAISED/ FEEDBACK RECEIVED	ARTC RESPONSE
Phase 1	Alignment selection Macintyre River crossing location	▸ community not consulted during crossing selection ▸ concerns around flooding and crossing location ▸ too much risk associated with crossing location ▸ alignment should follow the existing Boggabilla track	▸ ARTC undertook 6 face-to-face meetings, 3 community drop-in sessions, a Toomelah LALC meeting and 3 council meetings during Phase 1 ▸ these campaigns involved seeking information from the community to confirm the modelling findings ▸ MCA Phase 1 route alignment strategy made publicly available on Project web page ▸ option D1 was selected through the Inland Rail MCA process ▸ option A was recognised as the preferred community alignment within the MCA ▸ ARTC is guided by the same flood immunity criteria regardless of which route is selected ▸ ARTC implemented an education campaign to help the community better understand the flood immunity criteria
Scoping of EIS	Preliminary Macintyre River floodplain crossing design	▸ community not consulted during crossing selection ▸ concerns around flooding and crossing location ▸ too much risk associated with crossing location ▸ alignment should follow the existing Boggabilla track ▸ concerns around DPIE's model and data used to develop Project flood model ▸ impacts on flooding as a result of levee bank heights in the area ▸ impacts of Project on flood flow paths, velocities and afflux levels ▸ impacts to farming operation due to flooding ▸ impact of Project on in-flows to irrigators	▸ ARTC undertook 7 face-to-face meetings, 3 CCC meetings, 3 council presentations, 6 community drop-in sessions and a Toomelah LALC meeting during the preliminary Macintyre River crossing design phase ▸ 4 technical flood workshops held using 3 recommended local flood specialists ▸ feedback received from technical flood workshop was incorporated into the flood model and preliminary design April–June 2019 ▸ ARTC ran specialised engagement campaigns about the flood model ▸ ARTC will continue to work with landowners concerned with hydrology throughout the detailed design, construction and operational phases of the Project ▸ ARTC will continue to work with directly impacted landowners affected by the alignment throughout the detailed design, construction and operational phases of the Project ▸ education program on flood immunity design criteria which has been used to develop the reference design ▸ MCA Phase 2 route alignment strategy made publicly available on Project web page ▸ monthly e-newsletters distributed to share information about the MCA process and review, flood modelling updates, technical documents available on the Project web page
Reference design	Macintyre River floodplain crossing solution	▸ raised concerns around the economic impact between options A and D1 ▸ economic opportunities lost due to option D1 ▸ perceived flood impacts	▸ ARTC undertook 7 face-to-face meetings and design correspondence, a Toomelah LALC meeting, 3 council presentations, 2 CCC meetings, 2 community information sessions ▸ 2 technical workshops to present findings of additional investigations and to close out the alignment selection ▸ monthly e-newsletters distributed to share information about the MCA process and review, flood modelling updates, technical documents available on the Project web page

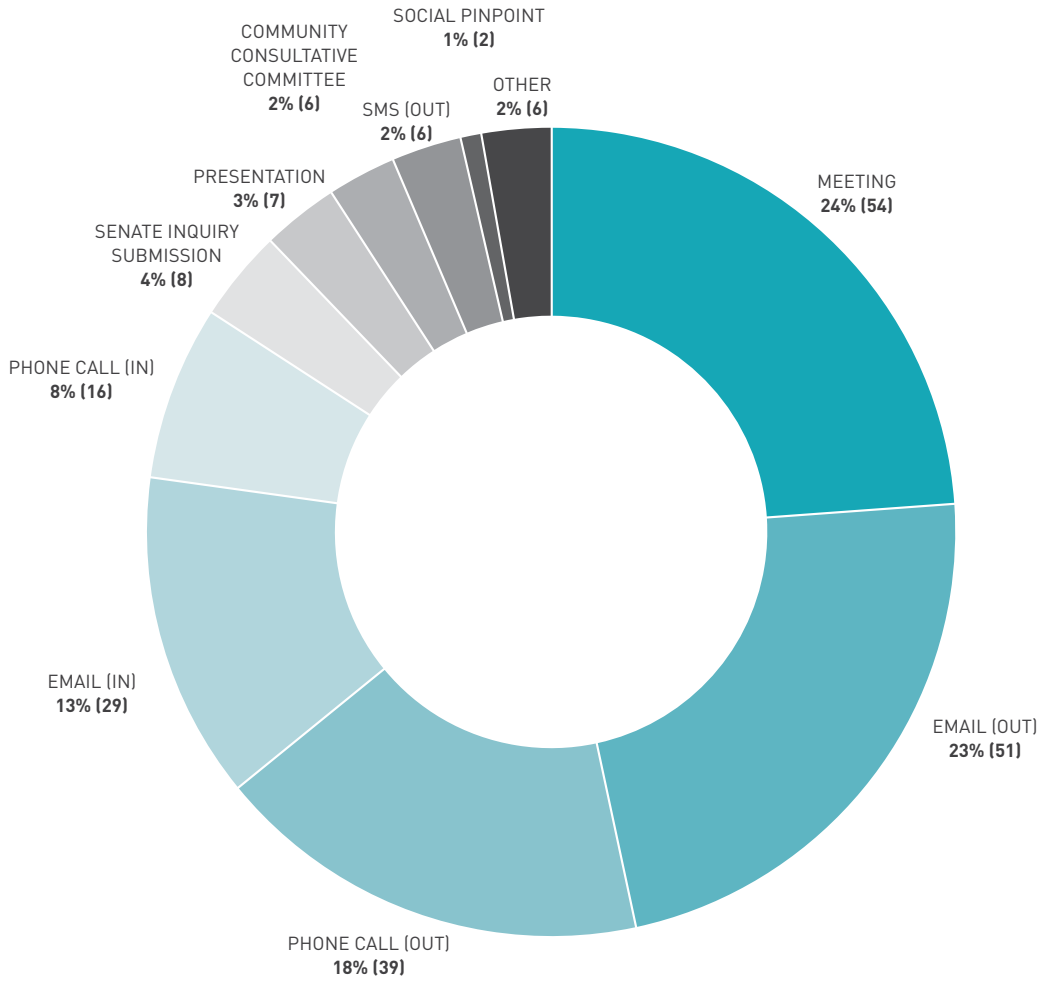
OVERVIEW OF MACINTYRE RIVER FLOODPLAIN MODEL DEVELOPMENT STAKEHOLDER ENGAGEMENT ACTIVITIES

Flood design limits consultation

In addition to hydrology consultation, key stakeholders were shown the flood design limits criteria and the predicted flood impacts relative to their properties. This included changes in afflux, velocities and times of inundation. The information was presented and feedback collected through the engagement activities shown in the chart below.

Key stakeholders included:

- three local councils
- directly affected landowners
- asset owners
- local flood specialists
- Community Consultative Committee members
- Toomelah Local Aboriginal Land Council
- the broader community.



HYDROLOGY AND FLOOD DESIGN LIMITS ENGAGEMENT ACTIVITIES

Proposed workers' accommodation consultation

ARTC is seeking approval to install a temporary workers' accommodation facility at the North Star Sports Club in North Star. The facility is proposed to house up to 350 workers and remain during construction of both the Narrabri to North Star Project and the North Star to NSW/Queensland Border Project (approximately four years).

Themes raised by the three local councils and the North Star community included:

- business and employment opportunities (local procurement)
- amenity upgrade opportunities including fuel depot, corner shop
- impact on North Star's utilities, particularly water supply
- waste management
- traffic management
- camp behaviour and community safety
- impact on social amenity and community events.

While there were concerns raised relating to the proposed workers' accommodation, many of these concerns can be mitigated through the following controls:

- ensuring local community events are not disrupted by installing workers' accommodation at the North Star Sports Club
- a 'community acceptable' level of security management is implemented for the duration of the workers' accommodation facility
- a traffic management plan that minimises traffic impacts to North Star is implemented.

These controls are in addition to the identified potential mitigations.

ARTC is seeking approval to install an access point on the northern side of the North Star township to minimise traffic impacts on the North Star community and for the camp facility to be completely self-sufficient to minimise impacts on local utilities.

ARTC will continue to work closely with the North Star Sport Club, North Star Public School, the North Star community and local councils during approval and construction phases.

PROPOSED WORKERS' ACCOMMODATION CAMP AND LAYDOWN AREAS AT NORTH STAR

Seven-day working roster

The Project is seeking approval to implement a seven-day working roster, Monday to Sunday, 6.30am to 6.00pm.

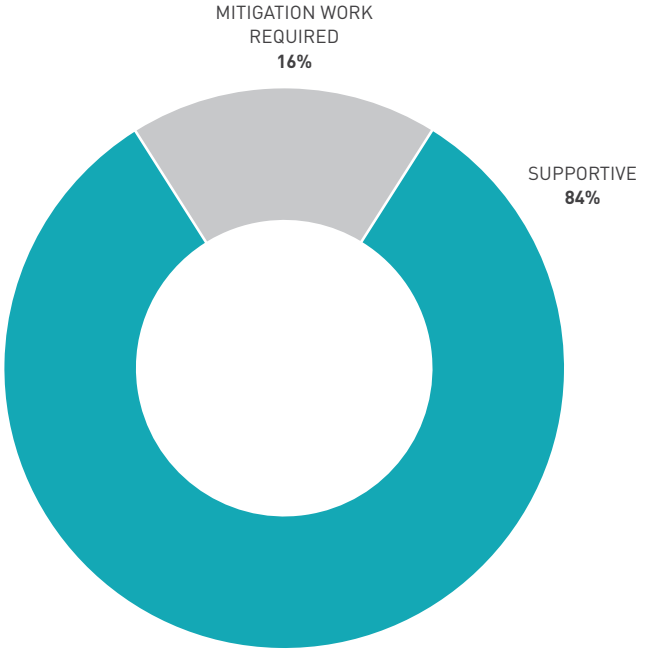
Themes raised by the three local councils and the North Star community included:

- traffic management
- safety management
- noise management
- support for shorter construction period
- concerns relating to additional construction work hours, for example night works
- concerns about community sentiment (support for seven-day working roster) may change over the period of construction.

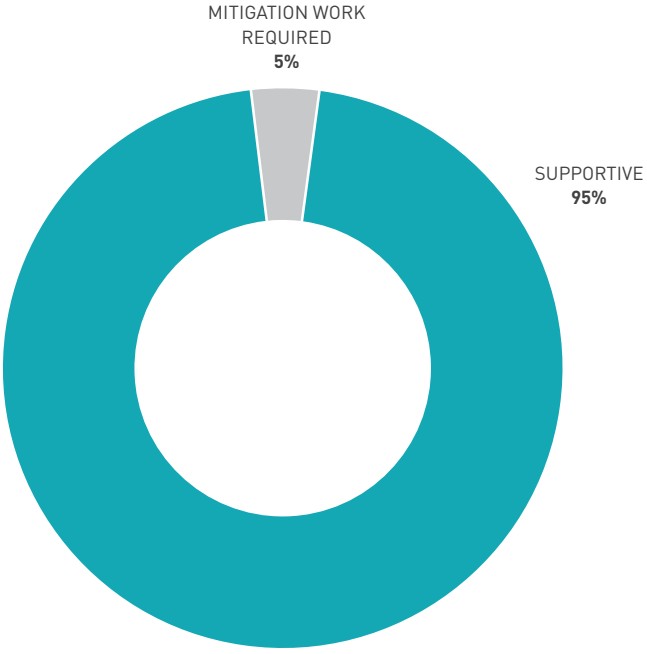
Like the workers' accommodation survey results, many of the 'mitigation work required' responses can be mitigated by:

- ensuring noise impacts are managed to ensure minimal disruption to directly affected stakeholders
- providing affected stakeholders with the Inland Rail complaints line, enabling them to make formal complaints as required
- implementing a traffic management plan that minimises traffic impacts on affected stakeholders
- continuing to engage with affected stakeholders and seeking their feedback throughout construction.

ARTC will continue to work closely with the North Star community, local councils and affected stakeholders during the construction phase of the Project.



WORKERS' ACCOMMODATION SURVEY RESULTS



SEVEN-DAY ROSTER SURVEY RESULTS

Key findings of the EIS

An EIS has been prepared for the North Star to NSW/Queensland Border Project and is now available for public comment.

The purpose of this EIS is to identify and address the potential environmental, social and economic impacts of the Project.

The purpose of this EIS is to identify and address the potential environmental, social and economic impacts of the Project through a thorough environmental impact assessment and identify measures to minimise and avoid these impacts.

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation measures to be implemented during the detailed design, construction and operational phases of the Project.

These measures will facilitate compliance with relevant legislation and any conditions of approval on the Project. Further detail can be found in the EIS chapters and appendices referenced under each key finding of the EIS and **Chapter 27: Environmental Management Plan.**

This summary document is intended to be read alongside the Project's Environmental Plan for a complete picture of both the impacts and proposed mitigation.

Want to know more?

See

- **Chapter 27: Environmental Management Plan**

of the Environmental Impact Statement

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 mostly consists of exotic grassland with scattered paddock trees.

The subject land was assessed under the Biodiversity Assessment Method (BAM) for all *Biodiversity Conservation Act 2016* (BC Act) listed ecological receptors and under the EPBC Act requirements where those species and/or communities were not captured under BAM. *Fisheries Management Act 1994* threatened species, populations and ecological communities were also considered and assessed.

One hundred and twenty-six ecological receptors were identified within the subject land for the purposes of this assessment. These varied from broad-scale ecological receptors such as landscape features, down to finer species-scale ecological receptors, including Threatened Ecological Communities (six listed under the BC Act and/or EPBC Act) and habitat for threatened flora and fauna species (16 flora species and 74 fauna species were identified).

Want to know more?

See

- **Chapter 11: Environmental Biodiversity**
- **Appendix B: Biodiversity Technical Report**
- **Appendix S: Aquatic Ecology Technical Report**

of the Environmental Impact Statement

The construction and operation of the Project 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 by invasion of weed and pest species
- reduction in the connectivity of biodiversity corridors
- edge effects
- habitat fragmentation
- barrier effects
- noise, dust and light impacts
- increase in litter (waste)
- erosion and sedimentation
- disturbance to specialist breeding and foraging habitat
- trampling of threatened species
- fallen timber and bush rock collection and removal
- fertiliser drift
- increased fire risk
- aquatic habitat degradation.

The proposed avoidance and mitigation measures for the Project were identified in order to reduce the significance of the potential impacts on ecological receptors. The mitigation strategies associated with the Project are presented within **Chapter 27: Environmental Management Plan.**

> One hundred and twenty-six ecological receptors were identified within the study area for the purposes of the flora and fauna assessment.

CURLEW SANDPIPER (CALIDRIS FERRUGINEA)

OOLINE

BLUEGRASS (DICHANTHIUM SETOSUM)

KOALA

SWIFT PARROT (LATHAMUS DISCOLOR)

TYLOPHORA LINEARIS

POPLAR BOX (EUCALYPTUS POPULNEA)

SPOT-TAILED QUOLL (DASYURUS MACULATUS MACULATUS)

Rehabilitation of borrow pits

The Project is seeking approval for up to eleven borrow pits currently comprising approximately 282.41 hectares (including both native vegetation and agricultural areas) to supply material to the Project.

The main objective for the rehabilitation of borrow pits associated with the Project is that land should be returned to a post-disturbance condition that will be:

- safe
- stable
- non-polluting
- able to sustain the proposed final land use (with minor maintenance required).

These plans will consider each individual site and the following aspects:

- landform stability
- land capability
- soil analysis
- flora, vegetation, pasture and fauna surveys.

Each borrow pit will be required to meet rehabilitation criteria, with a rehabilitation management plan and monitoring program.

Want to know more?

See

- **Chapter 9: Rehabilitation**

of the Environmental Impact Statement

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 Project area.

These sites included:

- 3 previously recorded Aboriginal Heritage Information Management System sites
- 51 new sites.

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 Catchment areas have also been extensively documented in a book published by the Border Rivers-Gwydir Catchment Management Authority.

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

It was also found that 22 artefact scatters, 12 isolated artefacts and nine culturally-modified trees will be directly impacted by the Project and seven culturally-modified trees will be indirectly impacted.

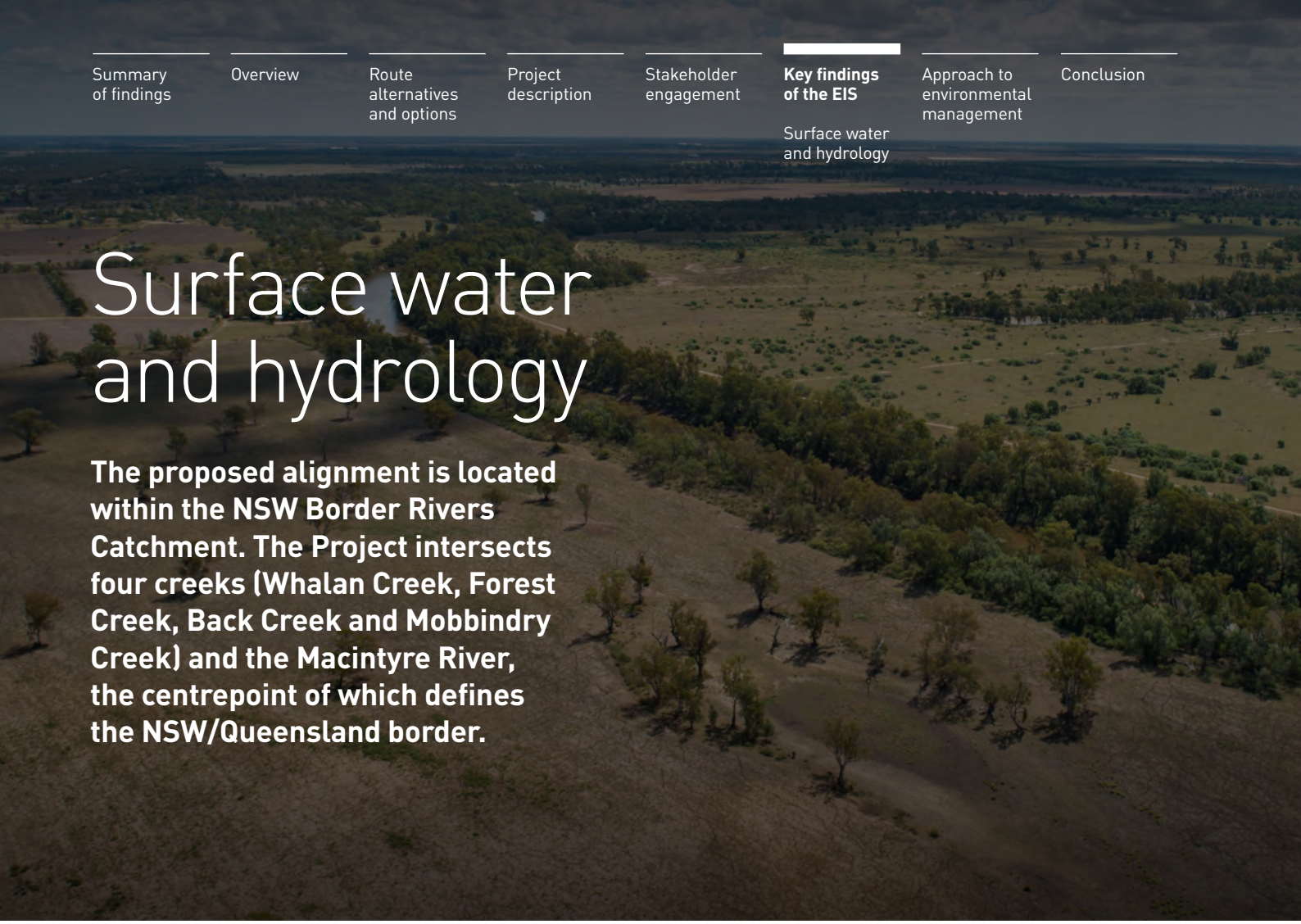
Of the 17 identified historical heritage sites, 12 will be directly impacted by the Project, including two railway sidings, two bridges and four fettler camps.

Want to know more?

See

- **Chapter 12: Heritage**
- **Appendix E: Indigenous Heritage**
- **Appendix F: Non-Indigenous Heritage**

of the Environmental Impact Statement



Surface water and hydrology

The proposed alignment is located within the NSW Border Rivers Catchment. The Project intersects four creeks (Whalan Creek, Forest Creek, Back Creek and Mobbindry Creek) and the Macintyre River, the centrepoint of which defines the NSW/Queensland border.

Land use within the NSW Border Rivers floodplain is mostly grazing and dryland cropping. Subsequently, it has been identified that water is primarily used for stock watering, irrigation, drinking water and household use. The NSW Border Rivers floodplain has experienced many flood events, notably in 1956, 1976, 1996 and 2011. Landowners are reliant on the flooding characteristics of the NSW Border Rivers floodplain for collecting and storing water for irrigation.

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

- 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

Want to know more?

See

- **Chapter 13: Surface Water and Hydrology**
- **Appendix G: Surface Water Quality**
- **Appendix H: Hydrology and Flooding**

of the Environmental Impact Statement

- increased surface water turbidity (water clarity) and sedimentation due to:
  - vegetation clearing, topsoil stripping, excavations and earthworks, which may increase the erodibility of exposed soils during construction
  - 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.

Hydrology and flooding

Flooding is a key concern for communities along the Project alignment. A hydrology and flooding assessment has been completed.

The assessment focused on understanding potential impacts and providing the necessary mitigations for flooding, hydrology and geomorphology.

This assessment involved the recreation of the 1976, 1996 and 2011 flood events based on historical data sources which were further supplemented with local community and flood specialist feedback. This was to ensure the hydraulic sub-model (the flood model) was fit for purpose as a design tool.

The design event hydrology was developed using *Australian Rainfall and Runoff: A Guide to Flood Estimation* flood flow estimations. The flood model itself was extended approximately 18 kilometres downstream of Goondiwindi (as per the outcomes of stakeholder feedback) and a LiDAR topographical survey was completed in October 2019 for inclusion in the model. This was completed as a response to stakeholder feedback requesting the most accurate and extensive understanding of this complicated floodplain.

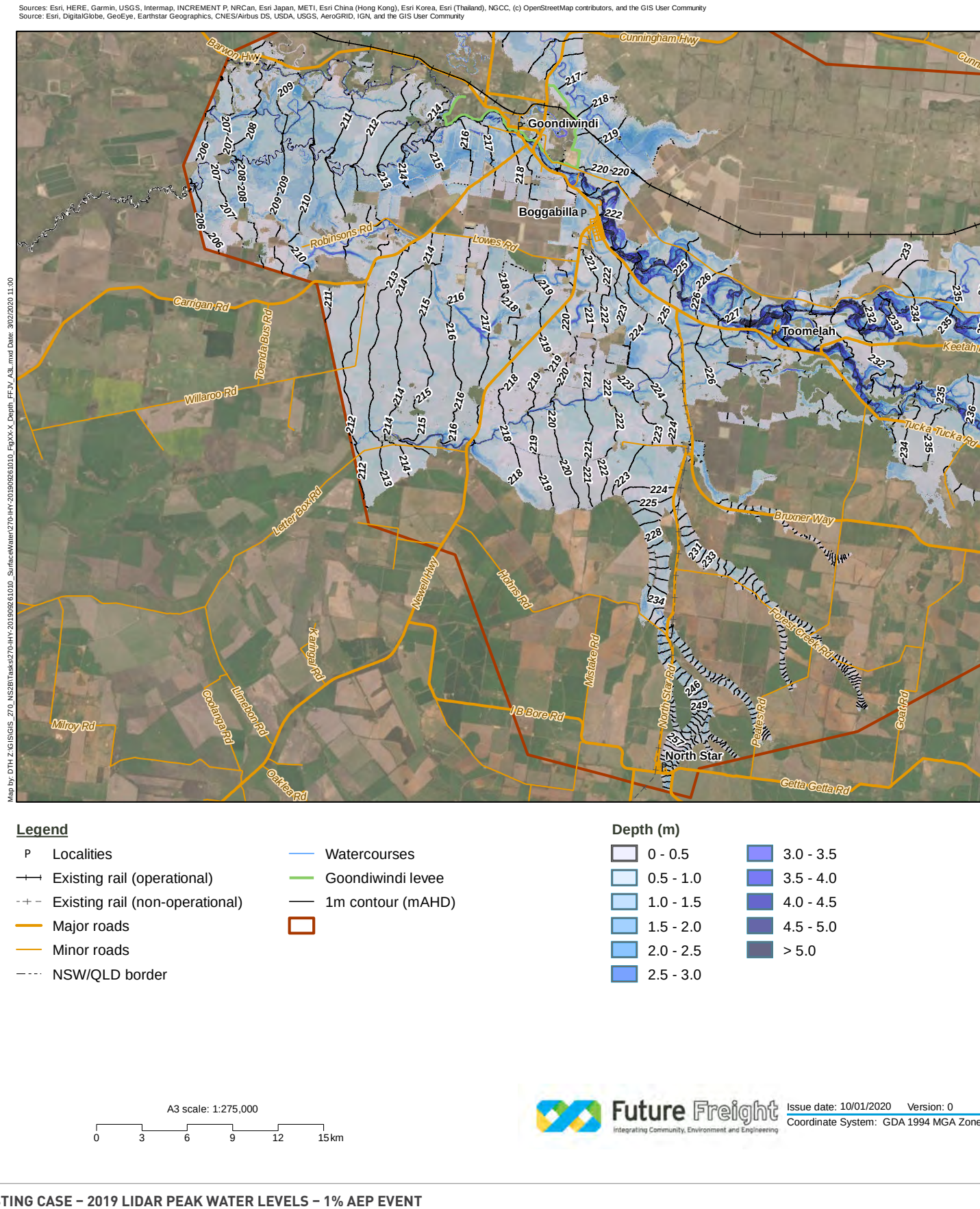
The flood model was run for a range of design events ranging from a 20 per cent annual exceedance probability (AEP) event to the probable maximum flood. A comparison of the existing case (no proposed works in place) and developed case, which incorporated the proposed works into the hydraulic model, allowed for assessment of the proposed works against the flood impact objectives.

Best practice flood risk management, including sensitivity testing, has been applied in developing the Project design to minimise risk to life, property, infrastructure, the community and environment.

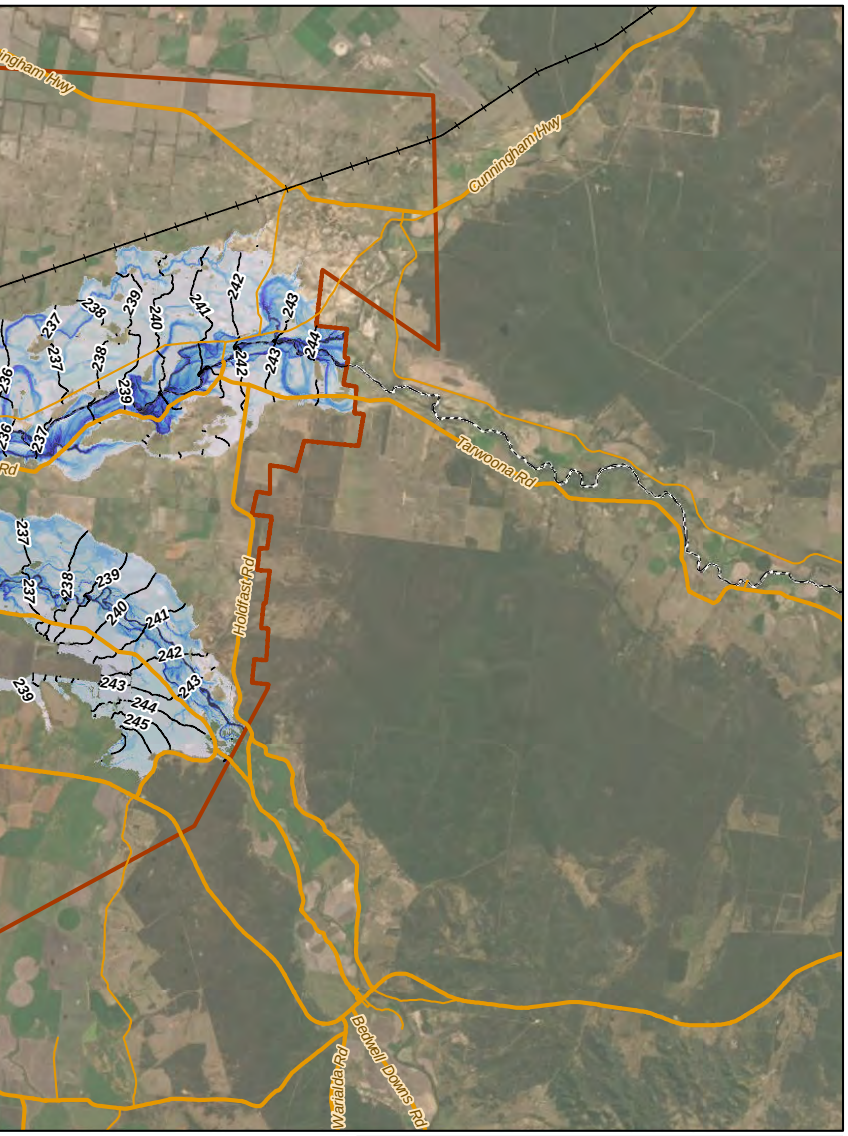
Surface feature investigations of targeted waterways were completed for six locations in accordance with the *Australian River Assessment System Physical Assessment Protocol.* Significant impacts to these waterways are not considered likely based on the results of the hydrology and flooding assessment which showed minimal to minor impacts on peak water levels, flood distribution and/or velocities.

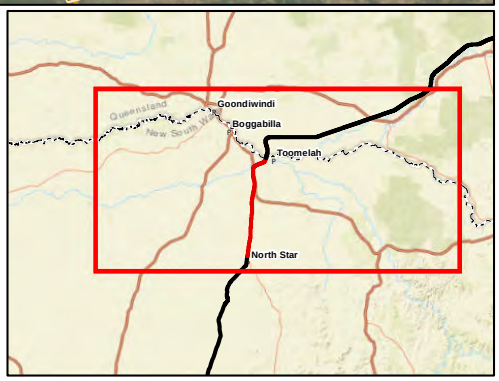
The maps on the following pages show peak water levels (flooding impacts) in existing and developed cases.

Best practice flood risk management, including sensitivity testing, has been applied in developing the Project design to minimise the risk to the community, environment, property and infrastructure.



EXISTING CASE – 2019 LIDAR PEAK WATER LEVELS – 1% AEP EVENT





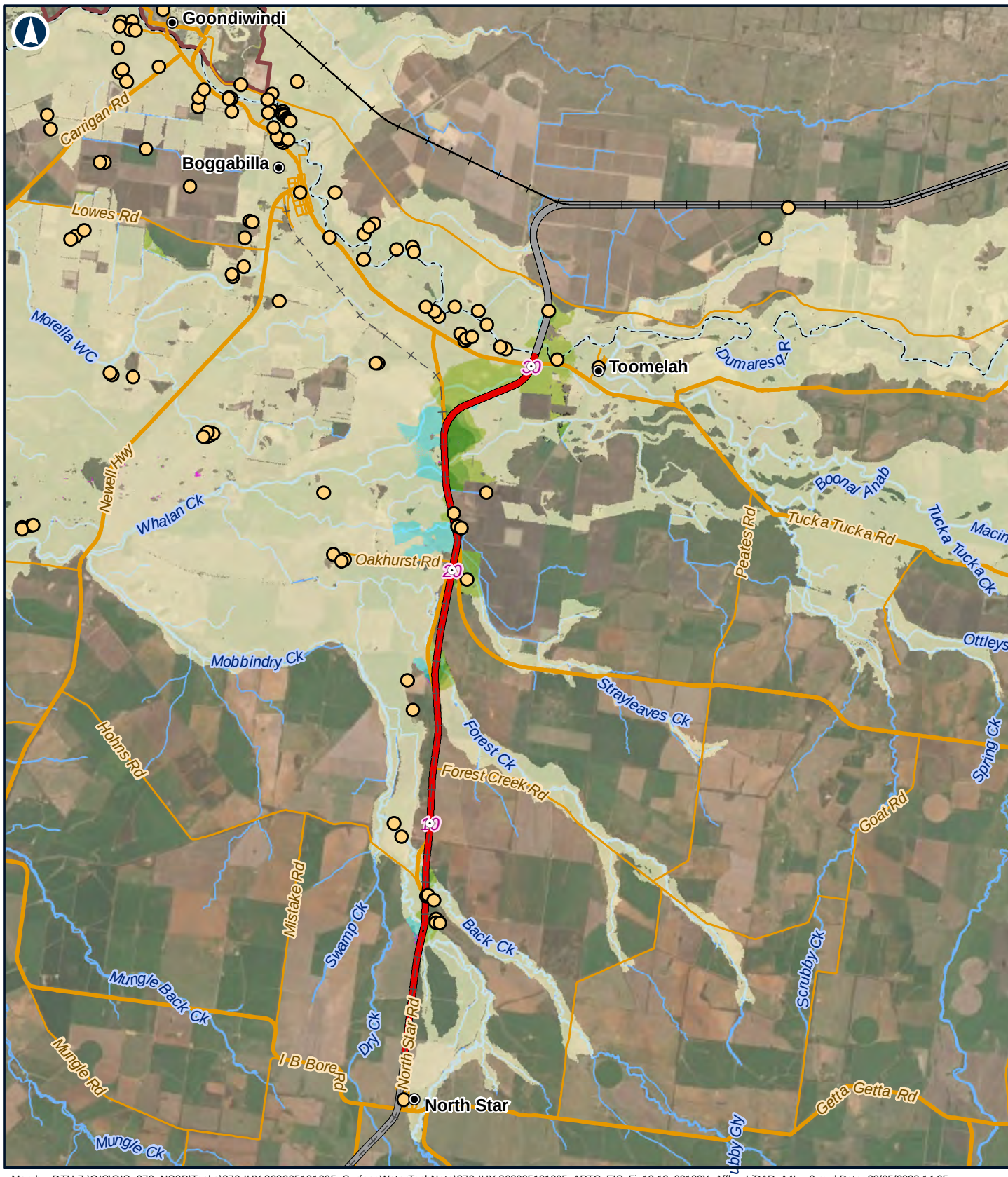
North Star to NSW/QLD border

Figure A8-B-1: Existing Case: 2019 LiDAR - Peak water levels - 1% AEP Event

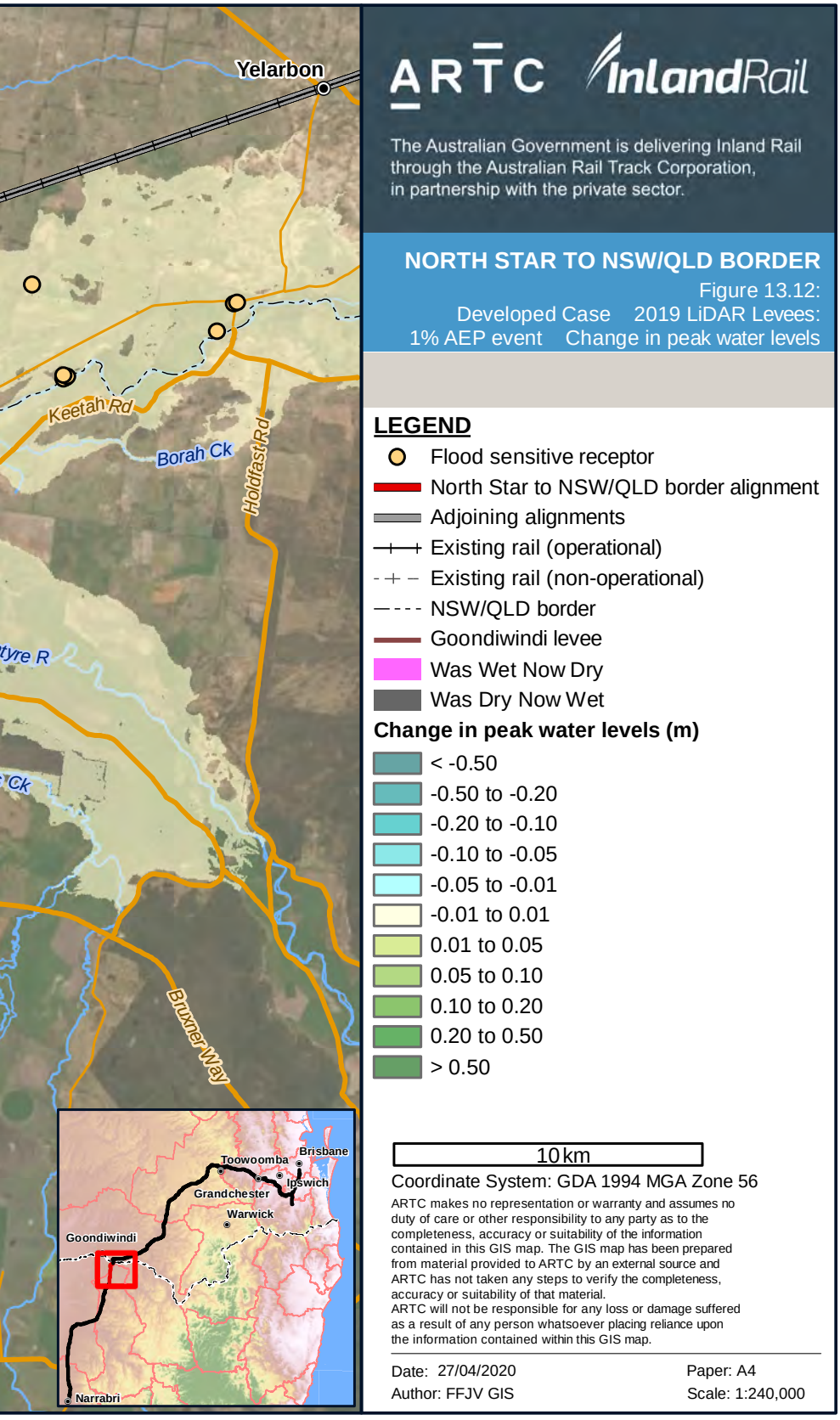
This map is described as the existing case as it does not include the proposed infrastructure.

It shows both the extent (the red outline) of the Macintyre River Flood Model and the predicted peak water level of a 1% Annual Exceedence Probability (AEP) flood event.

The flows from the 1% AEP event have been overlaid on the existing topography of the floodplain. This was surveyed using aerial LiDAR in late 2019 and includes the Goondiwindi levee (indicated in green).



DEVELOPED CASE - 2019 LIDAR - 1% AEP EVENT (CHANGE IN PEAK WATER LEVELS)



This map is called the Developed case as it includes the alignment of the proposed infrastructure.

It further shows the predicted change in peak water levels for a 1% AEP event as a result of the infrastructure. It is based on the existing topography of the floodplain which was surveyed using aerial LiDAR in late 2019.

Development of the Macintyre River floodplain model

STEP 1	STEP 2	STEP 3
JUN 2018	**AUG–DEC 2018**	**APR 2019**
Development of the preliminary Macintyre River floodplain model*	Collating the information to validate the base Macintyre River floodplain model	Understanding the potential impacts – Macintyre River floodplain model and preliminary crossing solution
WHO WAS INVOLVED?		
ARTC, hydrology consultants, Office of Environment and Heritage** (OEH), Department of Planning, Industry and Environment (DPIE).	ARTC, hydrology consultants, landowners, Moree, Gwydir and Goondiwindi councils, emergency services, OEH, Toomelah and Boggabilla Local Aboriginal Land Council (LALC), NS2B Community Consultative Committee (CCC), broader community.	ARTC, hydrology consultants, landowners, local flood specialists, Moree, Gwydir and Goondiwindi Councils, emergency services agencies, OEH, Toomelah and Boggabilla LALC, NS2B CCC, broader community.
WHAT CONSULTATION TOOK PLACE?		
▸ ARTC and the Future Freight Joint Venture (FFJV) hydrological team met with OEH to gather information required to develop the sub-catchment model (base Macintyre River floodplain model) ▸ information collected included all available historic flood event data (1976, 1996 and 2011) and LiDAR data (ground surface mapping – topography mapping) ▸ ARTC and FFJV met with DPIE to confirm study methodology and design process to ensure flood model had been developed in accordance with the DPIE Secretary's Environmental Assessment Requirements (SEARs).	▸ we presented the preliminary Macintyre River floodplain model to stakeholders ▸ historic flood markers were presented and confirmed to validate the accuracy of the model against the 1976, 1997 and 2011 flood events ▸ historic flood photographs were surveyed to validate the model.	▸ we presented the Macintyre River floodplain model to stakeholders ▸ we held technical flood workshops to validate and calibrate the Macintyre flood model against 1976, 1996 and 2011 events ▸ confirmed existing environmental constraints ▸ we presented the preliminary crossing solution.
WHAT COMMUNICATION TOOLS WERE USED?		
Stakeholder meetings and presentations.	Landowner meetings, council presentations, emergency services meetings, OEH meetings, data sharing, survey and field investigations, community drop in sessions and LALC meetings.	Landowner meetings, technical flood workshops, council presentations, emergency services meetings, OEH meetings, data sharing, survey and field investigations, community drop in sessions, LALC meetings and e-newsletters.
WHAT WERE THE OUTCOMES?		
Base Macintyre River floodplain model developed.	Refinements and enhancements were made to the base Macintyre River floodplain model. It was validated and calibrated against all available historic flood information including community inputs.	Refinements and enhancements were made to the Macintyre River floodplain model. It was validated and calibrated against all available historical flood information including community inputs.

***Development of the preliminary Macintyre River floodplain model**

- data gathered and assessed
- latest OEH model and survey obtained
- stream gauge data obtained
- new LiDAR survey purchased
- data assessed and missing information identified for inclusion in the model (eg. 2011 flood data)
- flood markers surveyed.

STEP 4A	STEP 4B	STEP 5
JUN 2019	**AUG 2019–JUL 2020**	**AUG 2020**
Refine Macintyre River floodplain model and manage impacts	Further enhancements to Macintyre River floodplain model	Project approval – submission of EIS proposal
WHO WAS INVOLVED?		
Landowners; local flood specialists; Moree, Gwydir and Goondiwindi councils; OEH, Toomelah and Boggabilla LALC.	Landowners; local flood specialists; Goondiwindi Regional Council; Department of Infrastructure, Transport, Regional Development and Communications (DITRDC).	DPIE.
WHAT CONSULTATION TOOK PLACE?		
▸ we presented the refined Macintyre River floodplain model to stakeholders including feedback received and enhancements made ▸ we presented the refined preliminary crossing solution design ▸ we met with potentially affected stakeholders to present impacts and proposed mitigations where required.	▸ we met with stakeholders to seek feedback on the refined Macintyre flood model and to discuss opportunities for model enhancement ▸ we listened to key areas of concern relating to preliminary crossing solution design ▸ we met with potentially affected stakeholders to present impacts and proposed mitigations where required.	The community will have the opportunity to make submissions to DPIE as part of the decision-making process.
WHAT COMMUNICATION TOOLS WERE USED?		
Design and model presentations including visualisations and mapping, landowner meetings, technical flood workshops, council presentations, OEH meetings, LALC meetings and e-newsletters.	Design and model presentations including visualisations and mapping, landowner meetings, technical flood workshops, council presentations, surveys and field investigations, data sharing.	EIS and public submissions.
WHAT WERE THE OUTCOMES?		
Refinements and enhancements were made to the Macintyre floodplain model which included analysis of LiDAR data taken in 2015 and local knowledge of stakeholders and flood specialists. It continued to be validated and calibrated against all available historic flood information, including community inputs.	▸ incorporated the Goondiwindi township in the Macintyre River floodplain model ▸ updated the LiDAR data to reflect the current landforms within the Macintyre River floodplain ▸ further refined and enhanced the Macintyre River floodplain model if required ▸ presented the findings of the additional investigations to the local community.	Regulatory agency approval of project, taking into account any public feedback.

**OEH is now part of DPIE

Groundwater

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.

> Overall, the probability of construction activities and infrastructure types impacting on shallow groundwater resources is considered 'low'.

Want to know more?

See

- **Chapter 14: Groundwater**
- **Appendix N: Groundwater**

of the Environmental Impact Statement

Groundwater in the Project area is made up of two main aquifer (geological formations able to store and transmit water) systems including:

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

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

- clearing and grading could reduce evapotranspiration, potentially impacting 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 the above 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
- the ability of contaminants to penetrate shallow aquifers will be limited due to the low permeability of clayey soils in the upper two metres of soil across much of the Project site.

Within the Project site, groundwater is currently used for irrigation, stock watering, general farm purposes and drinking water (applies to several registered bores near the Toomelah community).

Land resources

Most potential impacts to land resources and contamination were found to have low residual risk upon implementation of initial mitigation measures during the design phase, and additional mitigation measures during the detailed design to decommissioning phases of the project.

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 construction, operational and decommissioning perspectives. Following the risk assessment, appropriate mitigation measures to be implemented during the three phases were recommended.

The assessment of land resources identified the following activities may adversely impact the rail corridor during each of the construction, operational and decommissioning phases:

- Project 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 of the Project 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
- the Project has the 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 (such as residential dwellings)
- 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, whilst 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 on and off site.

Want to know more?

See

- **Chapter 15: Land Resources and Contamination**

of the Environmental Impact Statement

Change to landform and topography during the construction phase of the Project was the only residual 'medium' risk.

Noise and vibration

In assessing noise and vibration levels, criteria were established to determine acceptable levels of noise and vibration that should not be exceeded by construction and operational activities.

What is a sensitive receptor?

People in the community who may be impacted by noise, air or visual impacts are called 'sensitive receptors'.

When the Project is operational, it will have the potential to generate noise for residents in their own homes, in schools, and in hospitals.

Some residents may not have experienced rail noise before and are concerned about potential impacts. Some residents currently live in areas where there are existing noise impacts from rail and are concerned about additional impacts.

In assessing noise and vibration levels, criteria were established to determine acceptable levels of noise and vibration that should not be exceeded by construction and operational activities. Where these criteria are exceeded, the Project must implement measures to mitigate the impacts to bring the noise and vibration levels to within acceptable levels.

Construction noise and vibration

The construction noise and vibration assessment undertaken for the Project considered reasonable, worst-case scenarios related to:

- site establishment
- earthworks
- structures
- drainage
- rail civil works
- road civil works.

Want to know more?

See

- **Chapter 16: Noise and Vibration**
- **Appendix J: Construction Noise and Vibration**
- **Appendix K: Operational Noise and Vibration**

of the Environmental Impact Statement

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 operational 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. Important to note, however, is the noise assessment considered reasonable, worst-case construction scenarios (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 Project is expected to occur progressively.

Due to the linear nature of the Project, 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 operational phase, comply with the relevant noise management levels.

Certain construction activities have been assessed as vibration intensive. This includes the use of piling rigs, tampers and vibratory rollers. Minimum working distances of up to 100 metres will apply to vibration intensive activities.

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 Bruxner Way was undertaken to predict potential noise impacts associated with the alteration of the alignment closer to residential receivers. This assessment was conducted in accordance with the relevant criteria outlined in the *NSW Road Noise Policy* for road redevelopments.

In cases where existing traffic noise levels are above the noise assessment criteria, the primary objective is to reduce these through feasible and reasonable measures to meet the assessment criteria. In assessing feasible and reasonable mitigation measures, an increase of up to 2 decibels (A) represents a minor impact that is considered barely perceptible to the average person. As the nearest residential receiver is located 2.3 kilometres 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 decibels (A) due to the proposed realignment. Therefore, no further consideration is necessary at this stage.

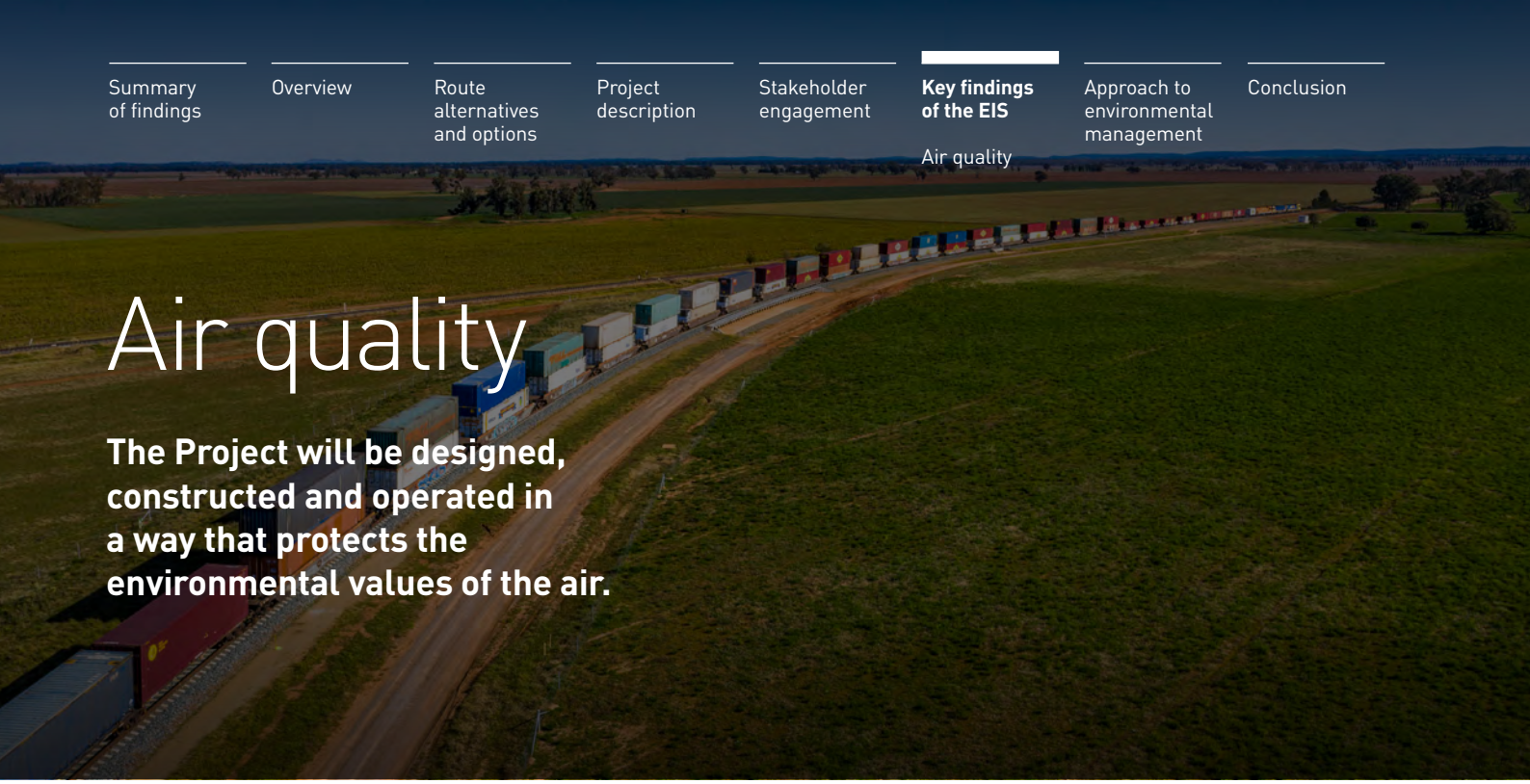
Detailed predictions for operational rail noise and vibration identified noise and vibration trigger levels from the *NSW Environment Protection Agency Rail Infrastructure Noise Guideline (RING)* can be achieved at most sensitive receivers in the area surrounding the proposed rail alignment.

The predicted rail noise levels were above the RING noise criteria at three receivers on the Project opening in 2025 and an additional two receptors, for a total of five receptors, by the design year of 2040.

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 recommend the consideration of mitigation measures for ground vibration or ground-borne noise.

Examples of sensitive noise receptors

- residential dwellings
- schools
- childcare centres
- places of worship
- open space – passive use (e.g. parkland, bush reserves)
- open space – active use (e.g. sports field, golf courses)
- hospitals



Air quality

The Project will be designed, constructed and operated in a way that protects the environmental values of the air.

Inland Rail may temporarily impact the air quality of nearby sensitive receptors including residences, schools and hospitals during construction and operations.

These impacts include:

- dust or emissions from earthworks and construction activities
- gas from diesel combustion of train exhausts
- dust from cargo and movement of train wagons on the tracks
- dust or emissions from operational maintenance activities.

The Project will be designed, constructed and operated in a way that protects the environmental values of the air. This was demonstrated through an air quality impact assessment of the Project which considered both construction and operational phases.

Air emissions from large linear infrastructure projects, such as Inland Rail, are difficult to estimate due to the broad range and temporary nature of construction activities. Also, construction sites are spread across a large area. As such, emissions from the Project 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.

All impacts associated with the operation of Inland Rail (including air quality) are assessed in line with state-specific and Commonwealth legislation. *The National Environment Protection Council (Ambient Air Quality) Measure* establishes national ambient air quality standards and a framework for monitoring and reporting.

Air quality impact assessments will determine the potential impacts to nearby sensitive receptors, and if any measures are needed to reduce and/or mitigate these impacts.

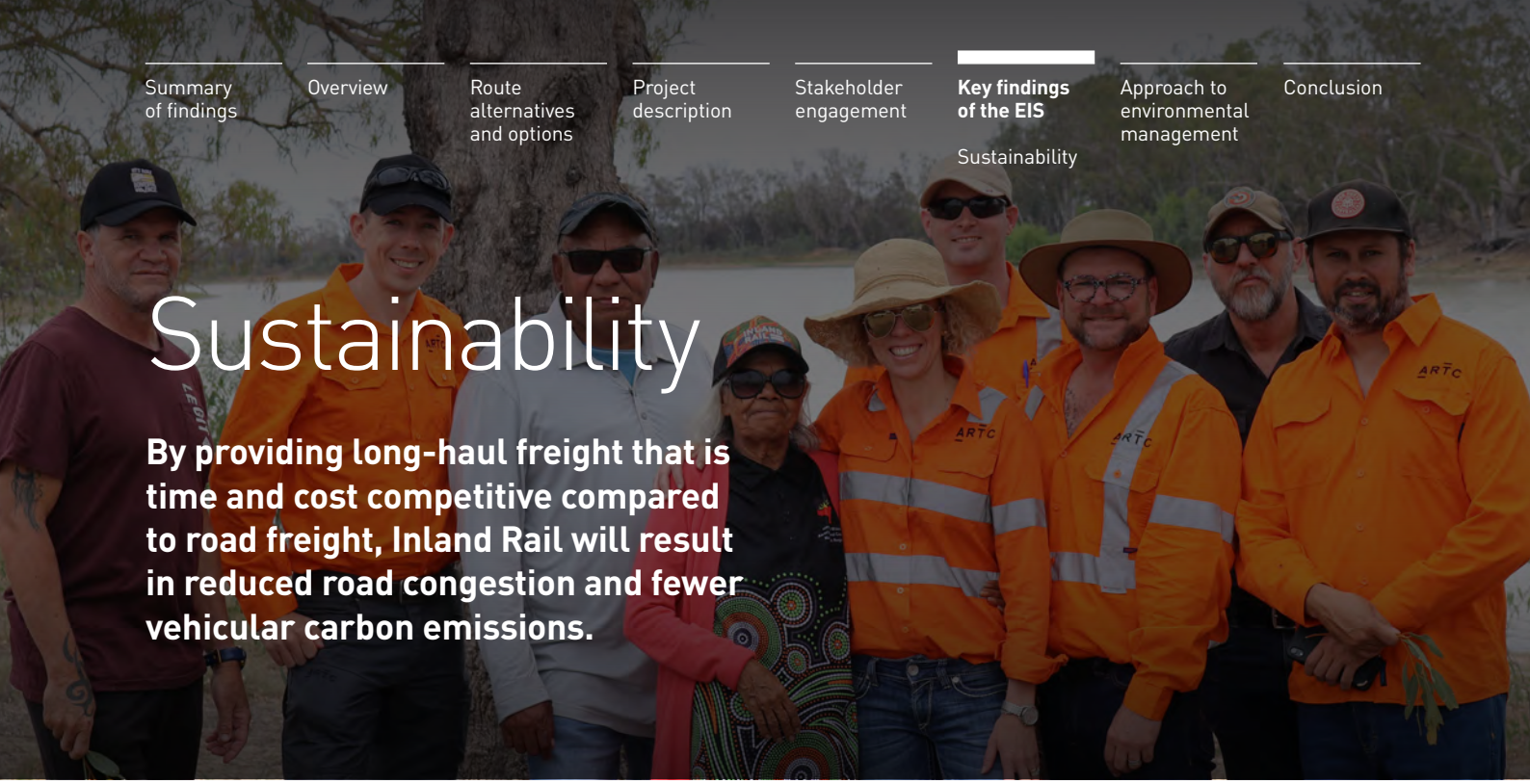
> Dispersion modelling was used to estimate emissions during the operational phase. The concentration of each pollutant is expected to comply with the relevant air quality criteria at the nearest sensitive receptors.

Want to know more?

See

- **Chapter 17: Air Quality**
- **Appendix L: Air Quality**

of the Environmental Impact Statement



Sustainability

By providing long-haul freight that is time and cost competitive compared to road freight, Inland Rail will result in reduced road congestion and fewer vehicular carbon emissions.

The Inland Rail Sustainability Strategy (ARTC 2019) and *Environment and Sustainability Policy* (ARTC 2018) outline sustainability objectives, targets and commitments for the Project.

A broad range of sustainability initiatives were identified and incorporated into the Project during the development of a reference design. Sustainability management measures have also been incorporated into the Project's mitigation measures.

Sustainability initiatives incorporated into the Project will contribute towards achieving an Infrastructure Sustainability Rating Scheme for the Project, which is administered by the Infrastructure Sustainability Council of Australia (ISCA). The Project's contribution will also form part of the Inland Rail Program's target of achieving an 'Excellent' rating.

It is estimated that transporting freight on Inland Rail will use one-third of the fuel compared to transporting the same volume via the existing routes.

Sustainability is an important consideration for the North Star to NSW/Queensland Border Project. As part of the wider Inland Rail Program, the Project provides opportunities to:

- maximise resource efficiency
- enhance local economic activity
- mitigate potential environmental and social impacts

Want to know more?

See

Chapter 18: Sustainability

of the Environmental Impact Statement

Traffic and transport

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

The overall aim during construction and operation of the Project is to:

- maintain the safety and efficiency of all affected transport modes for the Project workforce and other transport system users
- avoid or mitigate impacts to the condition of transport infrastructure
- ensure any required works are compatible with existing infrastructure and future transport corridors.

Construction impacts

During construction, the transportation of materials, equipment and personnel will be primarily 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.

Construction traffic has the potential to increase traffic volumes by up to five per cent relative to existing traffic in the region. 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, the level of service of some aspects of the road network is expected to reduce during construction.

Level crossings

The Project intersects roads at several locations and the proposed treatments/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
- sighting distances.

Want to know more?

See

- **Chapter 20: Traffic and Transport**
- **Appendix M: Traffic Impact Assessment**

of the Environmental Impact Statement

Private level crossings

Private level crossing locations have been discussed with landowners and consultation is ongoing. The reference design has determined 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.

Public level crossings

Increases in traffic associated with the construction of the Project are likely to increase vehicle exposure at rail crossings. Current non-operational public level crossings will be designed in accordance with safe design standards with consideration of sufficient stacking distances, sight distances, lane marking, and signage 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.

Public road/rail interface locations

The Strategic Plan for NSW Level Crossings, *Rail Safety National Law* (NSW), National Safety Policies for Railway Crossings and Regional Level Crossing Safety Strategies will be used to ensure mitigation measures for all public road/rail interface locations (level crossings) focus on safety, risk and operational efficiency through the analysis process. In addition, threshold and Australian Level Crossing Assessment Model assessment will be undertaken by ARTC prior to construction and post-construction to determine the appropriate protection type for the proposed crossing.

BRUXNER WAY DIVERSION (RED INDICATES ORIGINAL ROAD ALIGNMENT)

NORTH STAR LEVEL CROSSING

Climate change risk and adaptation

A climate risk assessment was undertaken to inform the design and operation of the Project. The assessment considered short-term risks (to 2030) and long-term risks (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 operational phase. Of the 34 identified risks, there would be five 'high risks' and one 'very high risk' to the Project by 2030, increasing to seven 'high risks' and three 'very high risks' by 2090.

> As the Project lifecycle progresses, risks will be regularly reviewed to ensure that potential climate impacts are reduced so far as is reasonably practicable.

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 on 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 Project 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 Project, which satisfies both SEARs and ISCA requirements.

The measures to manage climate risks are developing and evolving. As the Project 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.

Want to know more?

See

- **Chapter 19: Climate Change Risk and Adaptation**
- **Appendix Q: Climate Change Risk Assessment**

of the Environmental Impact Statement

Key risks

- **extreme rainfall and flooding**
- **extreme heat**
- **extreme storm and wind events**

Land use and property

The Project is situated in the New England North West Region of NSW. It passes through Gwydir Shire Council and Moree Plains Shire Council Local Government Areas.

Existing land uses in the vicinity of the Project include grazing, grazing modified pastures, and cropping

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

Outside the Boggabilla rail corridor, the Project 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 Project include grazing, grazing modified pastures, and cropping. The Project intersects regional roads, local roads, private access roads and utilities. The Project also crosses Mobbindry Creek, Back Creek, Whalan Creek and the Macintyre River, which are mapped watercourses.

Construction and operation of the Project may result in direct and permanent impacts to land use and tenure.

Want to know more?

See

- **Chapter 22: Land Use and Property**

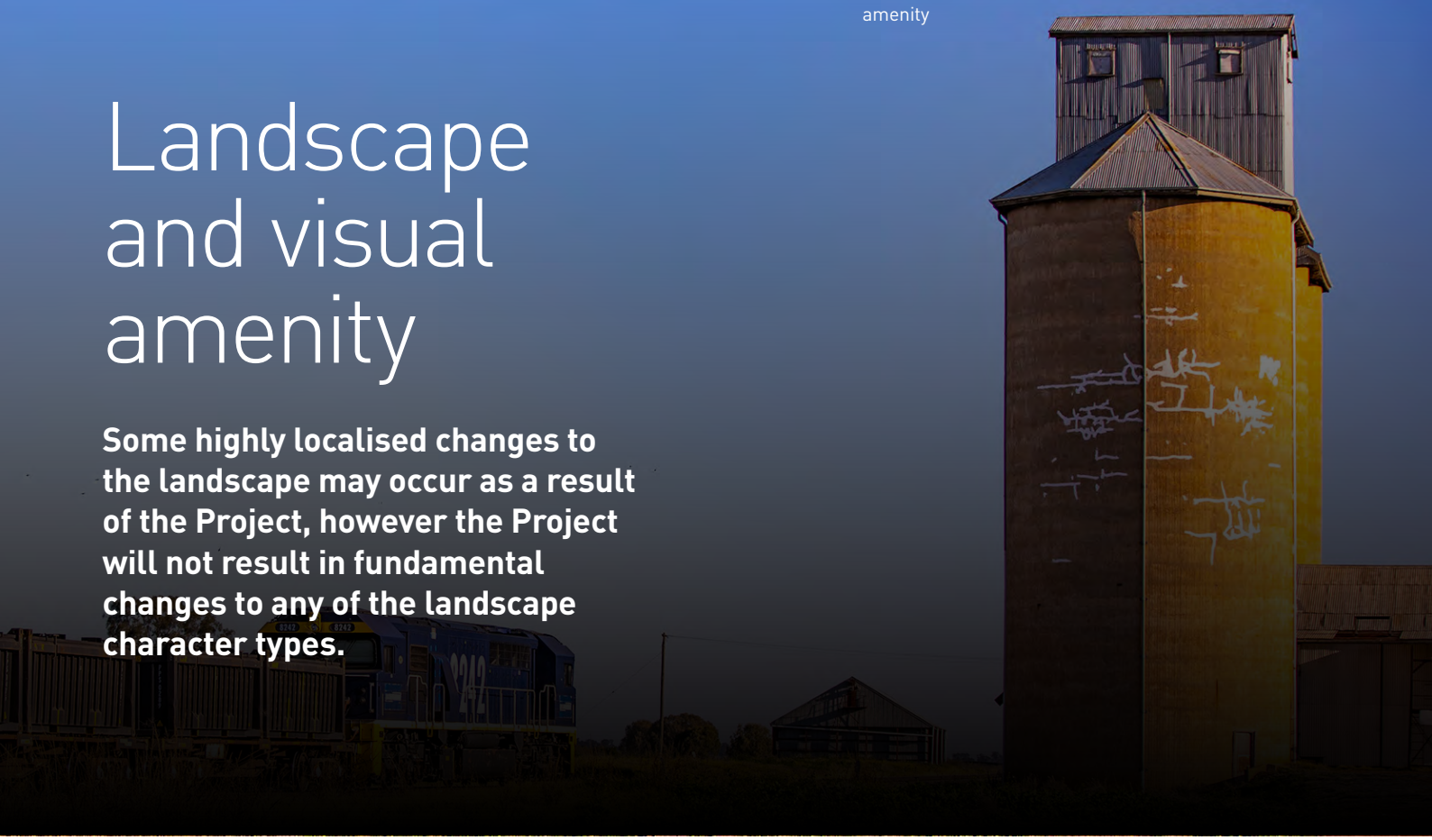
of the Environmental Impact Statement

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 the road network and property access
- impacts on utilities.

The proposed alignment was deliberately designed to purposely 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 in accordance with the relevant statutory instruments and in consultation with landholders
- rehabilitation of land required during the construction phase in accordance with a Reinstatement and Rehabilitation Plan
- a Traffic Management Plan will be 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 Project.



Landscape and visual amenity

Some highly localised changes to the landscape may occur as a result of the Project, however the Project will not result in fundamental changes to any of the landscape character types.

The landscape and visual impact assessment evaluated the impact of the Project on landscape, visual and lighting amenity through a combination of desk and field work. This included geographic information system analysis, visibility analysis mapping and preparing illustrative cross-sections and visualisations.

The Project is situated in a gently undulating rural area comprising open wooded, pastoral and agricultural landscapes. Six landscape character types were identified within the region.

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

There are relatively few visual receptors near the Project.

Want to know more?

See

- **Chapter 21: Landscape and Visual Amenity Assessment**
- **Appendix P: Landscape and Visual Amenity Impact Assessment**

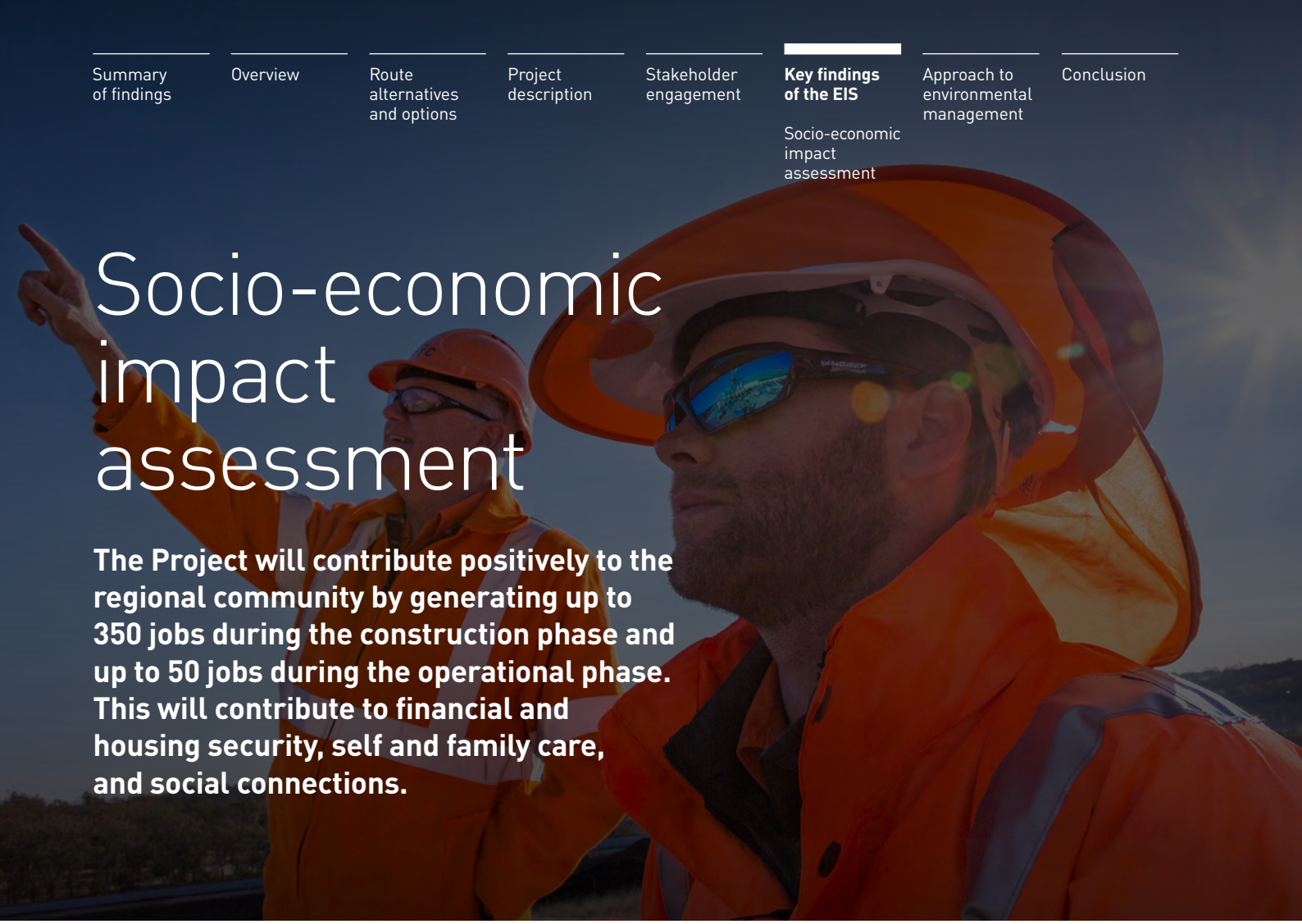
of the Environmental Impact Statement

As part of the visual assessment, six representative viewpoints of the Project 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) – 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 (whilst travelling).

During the operational phase, visual receptors may experience 'high' visual impacts from Tucka Tucka Road looking east (near the access road to Toomelah). 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 metres high and 1,800 metres long.

THE PROPOSED ALIGNMENT CROSSING THE MACINTYRE RIVER AND TUCKA TUCKA ROAD



Socio-economic impact assessment

The Project will contribute positively to the regional community by generating up to 350 jobs during the construction phase and up to 50 jobs during the operational phase. This will contribute to financial and housing security, self and family care, and social connections.

As for 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 Project, 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 Project'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 a regional level, if multiple Inland Rail projects are constructed at the same time, there may be a significant draw on trades and construction labour.

Want to know more?

See

- **Chapter 23: Socio-economic Impact Assessment**
- **Appendix I: Economic Assessment**
- **Appendix O: Social Impact Assessment**

of the Environmental Impact Statement

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

Local and regional businesses will benefit from the Project. Opportunities may include supplies of fuel, equipment, borrowed 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.

Social Impact Management Plan

The Social Impact Management Plan has been developed as part of the EIS and includes management measures that will be delivered during 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, cooperative and effective community and economic development program with the Toomelah community
- working closely with directly affected landowners 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 Project 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 their businesses.

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

The Project 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 Project
- 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 Project 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 Project 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.

Economic benefits assessment

The economic benefits assessment estimates the Project is expected to provide a total of $62.62 million in incremental benefits (at a seven 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 Project 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 has been concluded that it is likely the labour market conditions that will prevail during the construction phase of the Project 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 Project is also expected to deliver an additional 448 jobs per year during the construction period.

Hazard and risk

The hazard and risk assessment considered potential impacts to people, property and the environment either initiated or intensified by the Project, as well as risks from external factors including ground movement and climate conditions.

Health, safety and environmental hazards and risks have been assessed in the context of the Project. 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, operational and decommissioning (as it relates to construction) phases. These have been evaluated qualitatively to determine hazards 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.

Public health and safety values that may be impacted by the Project and other potential hazards associated with the Project, such as biosecurity, wildlife, natural events, dust (e.g. respirable silica, coal and other airborne contaminants such as naturally occurring asbestos), and noise and vibration have been assessed with 'low' or 'medium' residual risks.

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.

Want to know more?

See

Chapter 24: Hazard and Risk

of the Environmental Impact Statement

Potential hazards

- bio security
- dust
- wildlife
- noise and vibration
- natural events

All assessed with 'low' or 'medium' residual risks

Waste and resource management

Waste generation will occur throughout construction, operation and maintenance of the Project. Estimated waste types and quantities are indicative and have been identified to determine potential impacts, and waste and resource management options.

Waste generated during construction of the Project is likely to include:

- vegetation, roots, tree stumps, and general rubbish and debris
- some minor quantities of metal, wood, concrete and packaging waste as a result of establishing laydown areas and the construction camp
- greywater and sewage (wastewater streams) 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 generated by staff at the construction camp and site offices
- maintenance fluids generated by the operation of construction plant and equipment would include paints, solvents, lubricants and oils.

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

The capacity of each waste management facility will be confirmed in consultation with the waste management providers during the next phase of the Project.

Want to know more?

See

- **Chapter 25: Waste and Resource Management**

of the Environmental Impact Statement

Cumulative impacts

Cumulative impacts consider the residual impacts of the Project and assess these impacts against other coordinated/major projects.

The potential for cumulative impacts resulting from the interaction of the Project with other projects, either existing or proposed, in the surrounding area is considered 'low' for all aspects except for biodiversity where cumulative loss of habitat will place further pressure on local threatened flora and fauna species and ecological communities.

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

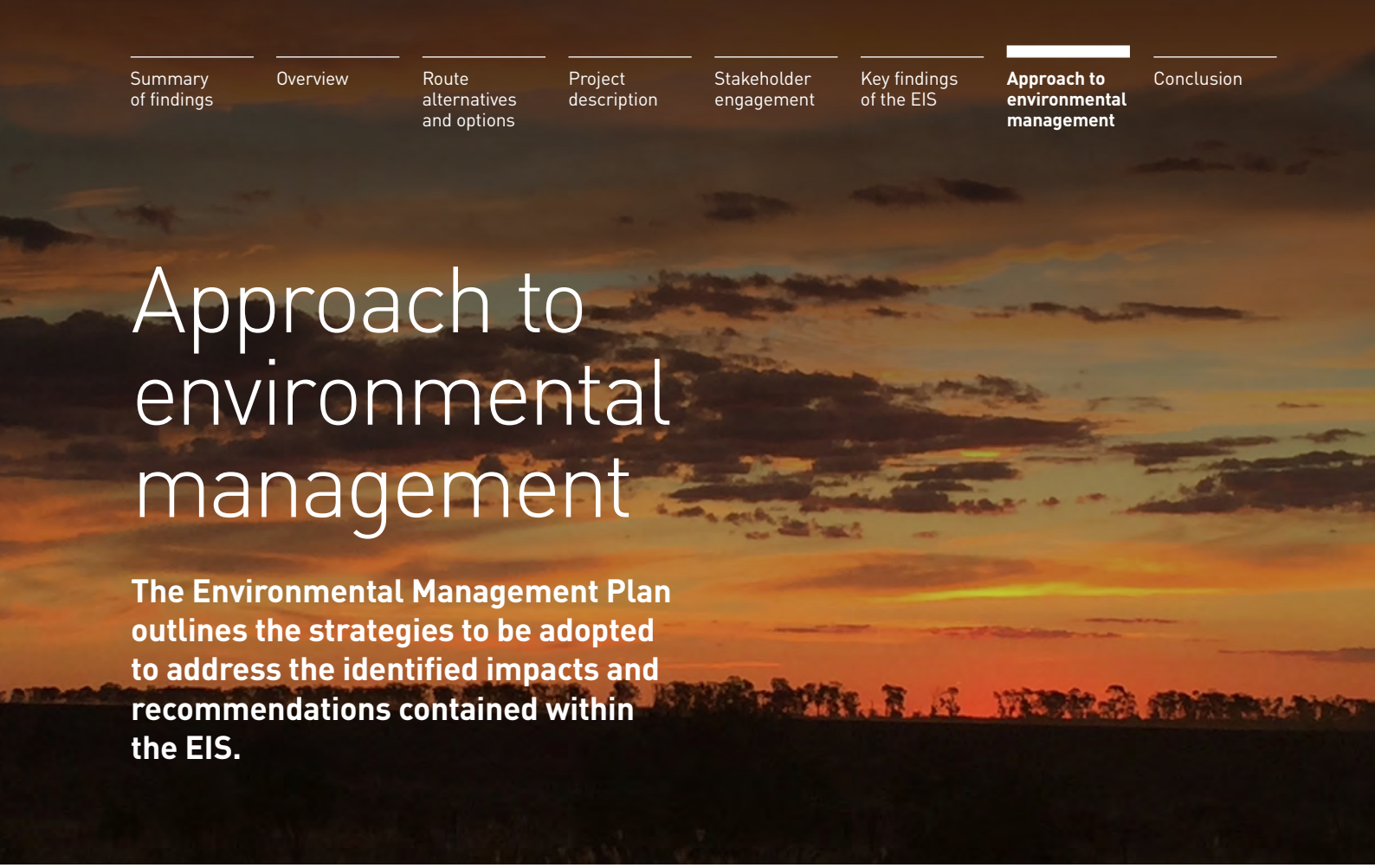
There are no anticipated cumulative impacts during the operational phase of the Project.

Want to know more?

See

- **Chapter 26: Cumulative Impacts**

of the Environmental Impact Statement



Approach to environmental management

The Environmental Management Plan outlines the strategies to be adopted to address the identified impacts and recommendations contained within the EIS.

Its purpose is to set out the Project's commitments to environmental management, including the identification of environmental aspects to be managed and how environmental values would be protected and enhanced. It also identifies mitigation measures relevant to the reference design for the Project.

Detailed Environmental Management Plans for construction and operation, as well as relevant sub-management plans, will be prepared by the Contractor and approved by relevant State agencies. These plans will include, but not be limited to, mitigation measures identified in each EIS chapter, the Environmental Management Plan and any conditions of approval.

Once in place, the Construction Environmental Management Plan and an Operational Environmental Management Plan will be dynamic documents. Each 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 submitted to the Secretary of Department of Planning, Industry and Environment for approval no later than one month prior to the commencement of any works, including early works and demolition.

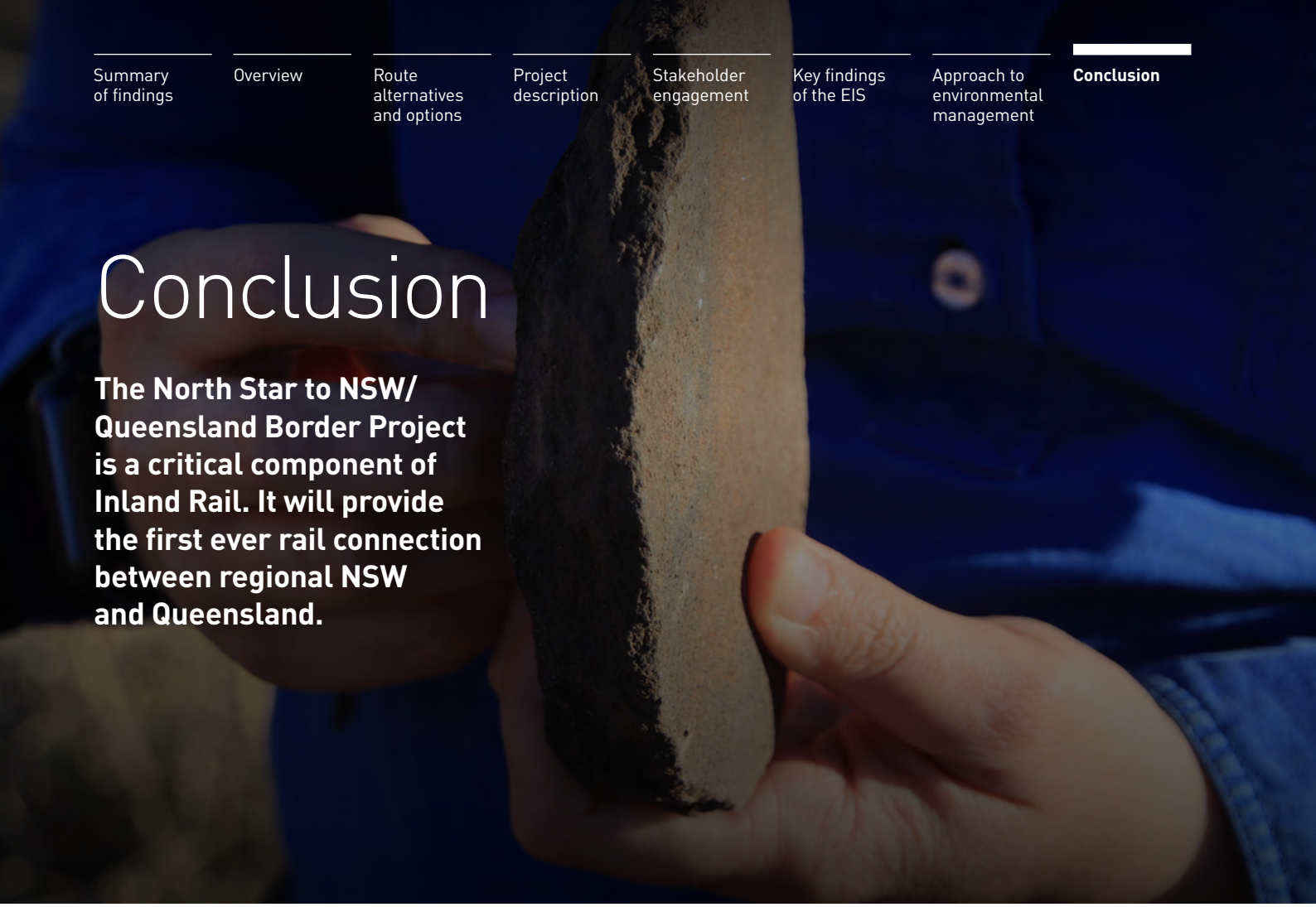
Want to know more?

See

- **Chapter 27: Environmental Management Plan**

of the Environmental Impact Statement

Once in place, the Construction Environmental Management Plan and an Operational Environmental Management Plan will be dynamic documents.



Conclusion

The North Star to NSW/ Queensland Border Project is a critical component of Inland Rail. It will provide the first ever rail connection between regional NSW and Queensland.

Inland Rail offers a safe and sustainable solution to existing freight bottlenecks and provides opportunities for complementary development to maximise the economic growth opportunities associated with the Project.

Australia's freight task is set to experience significant growth over the coming decades. The existing freight infrastructure cannot support this projected growth, with increasing pressure on already congested roads and rail lines through Sydney and increasing use of heavy trucks such as B-doubles and B-triples along the Hume-Pacific and Newell highway corridors.

Inland Rail will address the growing freight task by helping to move freight off the congested road network and moving interstate freight off the congested Sydney suburban rail network. It provides a reliable road competitive solution to the freight task and enables the commercial and social benefits of rail to be leveraged to meet Australia's long-term freight challenge.

Inland Rail will:

- connect key production areas in Queensland, NSW and Victoria with export ports in Brisbane and Melbourne
- provide linkages between Melbourne, Brisbane, Sydney, Adelaide and Perth
- reduce freight transit times
- reduce congestion on rail and road networks
- enable the movement of larger freight volumes via rail, by making the movement of longer and double-stacked trains possible.

Want to know more?

See

- **Chapter 27: Environmental Management Plan**
- **Chapter 28: Conclusion**

of the Environmental Impact Statement

Inland Rail will provide the backbone infrastructure necessary to significantly upgrade the performance of the east coast rail freight network to better serve future freight demands, while also diverting demand from the constrained road freight and rail passenger network.

The North Star to NSW/Queensland Border Project is a critical component of Inland Rail. It will provide the first ever rail connection between regional NSW and Queensland. Where possible, the Project has been designed to maximise use of the existing non-operational Boggabilla rail corridor, while still contributing to the overall efficiency of Inland Rail.

The Project involves constructing approximately 30 kilometres of single track, standard-gauge rail line between North Star and the NSW/Queensland border, and operating this section of rail line as part of Inland Rail. The Project is needed to support the development of the overall Inland Rail network between Melbourne and Brisbane.

Potential impacts resulting from the Project are considered manageable through the implementation of the proposed mitigation measures.

The detailed design for the Project 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 will continue to be developed with this overriding objective in mind, considering the input of stakeholders.

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation measures that would be implemented during detailed design, construction and operation of the Project.

Environmental Management Plan

Chapter 27 of the Environmental Management Plan summarises the environmental mitigation measures that would be implemented. The environmental performance of the Project would be managed by the implementation of the Construction Environmental Management Plan. The Construction Environmental Management Plan will also ensure compliance with relevant legislation and any conditions of approval.

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

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation measures that would be implemented during detailed design, construction and operation of the Project.