INLAND RAIL

INLAND RAIL ALBURY TO ILLABO

Scoping Report

2-0640-210-EAP-00-RP-0001

ARTC

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

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Acronyms and Abbreviations

NAME	DESCRIPTION
A2I	Albury to Illabo
A2I Proposal site	All areas within the railway corridor where enhancement works are carried out, extending between Albury to Illabo in NSW.
AHIMS	NSW Aboriginal Heritage Information Management System
ALCAM	Australian Level Crossing Assessment Model
Ancillary works	Ancillary works may include construction compounds and laydown areas as well as signaling and communications, signage, fencing, and services and utilities.
AOBV	Areas of Outstanding Biodiversity Value
ARTC	Australian Rail Track Corporation Ltd
ASC	Australian Soil Class
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CCC	Community Consultative Committee
CSSI	Critical State Significant Infrastructure
Culvert	A small channel, pipe or drain that allows water to pass under a road/rail line
DPIE	NSW Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
Emission	A substance discharged into the air
Enhancement Sites	Discrete sites within the A2I Project area that are proposed for infrastructure enhancement. This includes the 12 key enhancement sites as well as the signal gantries. Enhancement works at each of these discrete work sites may include raising, widening or replacing bridges, raising or replacing signal gantries, and lowering sections of track.
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
GDE	Groundwater Dependent Ecosystem
Inland Rail program (Inland Rail)	The Inland Rail program encompasses the construction and operation of a new inland rail connection between Melbourne and Brisbane, via Wagga Wagga, Parkes, Moree, and Toowoomba. The route for Inland Rail is about 1,700 km in length. Inland Rail will involve a combination of upgrades of existing rail track and the provision of new track
IRIG	Inland Rail Implementation Group

NAME	DESCRIPTION
LEP	Local Environmental Plan
Level crossing	A place where rail lines and a road cross at the same grade (or elevation).
LGA	Local government areas
Locality	Refers to an area within a 10 km buffer around the A2I Proposal Site
MBIR	Melbourne-Brisbane Inland Rail
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
PMST	Protected Matters Search Tool
Proposal	The Albury to Illabo enhancement works along 185 kilometres of existing operational narrow gauge railway from the Victorian/New South Wales border to Illabo in regional NSW. The proposal would provide clearance of the existing 'Main South' corridor to operate 1800 metre trains and includes the provision of dual track in some areas for train passing.
Rail infrastructure	Infrastructure required for the operation of a rail network, which includes tracks, wiring, signaling, stations etc.
SEARs	Secretary's Environmental Assessment Requirements
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
SEPP	State Environmental Planning Policy
SHR	NSW State Heritage Register
SSI	State Significant Infrastructure
TEC	Threatened ecological community
Track Slew Sites	Track slewing to provide horizontal clearance is required along selected sections of the Proposal.

1 Introduction

1.1 Background

The Australian Government has committed to delivering the Inland Rail Program, which is a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland.

Inland Rail is a major nation-building program that will enhance Australia's existing national rail network and service the interstate freight market.

The Inland Rail route, which is about 1,700 kilometres long, involves:

- Using the existing interstate rail line through Victoria and southern NSW;
- Upgrading about 400 kilometres of existing track, mainly in western NSW; and
- Providing about 600 kilometres of new track, mainly in northern NSW and south-east Queensland.

Inland Rail consists of 13 projects, seven of which are located within NSW. Each of these projects (and, in some cases as appropriate, separate work sites within a project) would be subject to an assessment and, if required, approval under the relevant planning or project laws in the relevant jurisdictions. Each assessment will also take into account its part in the Inland Rail program.

The project that is the subject of this application is the **Albury to Illabo** section (the Proposal) consisting of enhancement works to structures and sections of track along 185 kilometers of existing operational narrow gauge railway from the Victorian/New South Wales border to Illabo in regional NSW. The Proposal would provide clearance of the existing 'Main South' corridor to operate 1800 metre trains and includes the provision of dual track in areas for train passing. Proposal works also intend to prepare the alignment for future use of the infrastructure by freight trains up to 3.6km long, when necessary.

Australian Rail Track Corporation Ltd (ARTC) (the Proponent) is seeking approval to upgrade sections where enhancements are required to operate the **Albury to Illabo** section of the Inland Rail. The Proposal is shown in Figure 1.1. The enhancement sites where it is intended to carry out works, are outlined in Table 5.1 to Table 5.3 and shown in Figure 5.1. In addition, ancillary activities will be carried out associated with and supporting the work activities at the enhancement sites.

As the alignment is presently operational, no additional works will be carried out outside sites nominated above and consequently, environmental investigations outlined in this Scoping Report, will not be extended to those existing parts of the A2I alignment where no works are planned in this Proposal.

The Proposal is subject to environmental assessment under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) through the effect of Part 3 Division 15 of *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP). ARTC is defined as a public authority for rail infrastructure developments in accordance with clause 277(1) of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). Accoringly, the Proposal will be permissible without consent. The capital investment value of the Proposal is estimated to be in excess of $50 million, and as a result the Proposal is State Significant Infrastructure (SSI) under *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). As SSI, the Proposal requires approval from the NSW Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.

This document supports an application to the NSW Department of Planning, Industry and Environment (DPIE) seeking the Secretary's Environmental Assessment Requirements (SEARs) for the Environmental Impact Statement (EIS), as part of the first step in the approvals process for the Proposal.

ILLABO
GANMAIN
COOLAMON
COOLAMON SHIRE COUNCIL
JUNEE
JUNEE SHIRE COUNCIL
NARRANDERA SHIRE COUNCIL
ESTELLA
COOTAMUNDRA-GUNDAGAI REGIONAL COUNCIL
WAGGA WAGGA
GUMLY GUMLY
FOREST HILL
URANQUINTY
WAGGA WAGGA CITY COUNCIL
LADYSMITH
LOCKHART
THE ROCK
TARCUTTA
LOCKHART SHIRE COUNCIL
HENTY
CULCAIRN
SNOWY VALLEYS COUNCIL
HOLBROOK
GREATER HUME SHIRE COUNCIL
WALLA WALLA
TUMBARUMBA
NSW
JINDERA
MURRAY RIVER
ALBURY CITY COUNCIL
VIC
ALBURY
BELLBRIDGE
WODONGA
KILLARA

Albury to Illabo

Figure 1.1 - Location of the Albury to Illabo Proposal site

MAP 1 OF 1

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090
Data Sources: GA Geodata; Inset : Bing

LEGEND

- A2I Proposal
- Railway
- Major River
- LGA Boundary

INLAND RAIL ARTC

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

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1.2 Overview of the Proposal

The **Albury to Illabo** (A2I) section of Inland Rail passes through the Albury town centre on the Victoria / NSW border and travels roughly north to north-east through Wagga Wagga and Junee in central south regional NSW until it reaches Illabo. The boundary between Victoria and NSW is defined as the top of the southern bank or left bank of the Murray River[1].

The Proposal would provide enhancement of the existing 'Main South' corridor to operate double stack trains up to 1,800 metres long and 6.5 metres high. Components of the construction would include infrastructure to accommodate possible future augmentation and upgrades of the track, including a possible future requirement for 3,600 metre trains. Clearing of the corridor would occur to allow for construction and to maintain the safe operation of the railway.

Enhancement works to existing structures and track is required to provide the increased vertical and horizontal clearance required for double-stacked freight trains. Enhancement works include raising, widening or replacing bridges, raising or replacing signal gantries, track slews, platform works, level crossings and lowering sections of track.

1.2.1 Key features

The enhancement works comprises of modification, removal or replacement of structures (such as signals, gantries, bridges) and the slewing and lowering of track. The key features of the Proposal, as currently designed and subject to further design refinement are within four major site precincts: Albury, Wagga Wagga, Junee and Murray River Bridge. Each of these four sites would require a discreet set of vertical and horizontal clearance activities (refer to Section 5.2).

In addition, there are several discrete sites such as Wagga Road track lowering at Ettamogah, track lowering at Pearson Street Wagga Wagga, a potential bridge replacement within the Uranquinty Track Slew Site (Sandy Creek) and the removal of a pedestrian footbridge at Culcairn.

The Proposal would also comprise of:

- approximately 26 kilometres of track slewing to allow trains vertical and horizontal clearance at gantries and all rail corridor structures according to Inland Rail clearance specification;
- underbridge and culvert modifications in enhancement sites only, to allow slews to be carried out;
- provision of signalling infrastructure (such as signal gantry);
- aerial cable clearances (including associated overhead powerlines);
- relocation or protection of utilities (such as telecommunications, water mains, etc);
- modification of awnings at station buildings and structures (such as platforms) to maintain a safe distance from the track as currently designed and is subject to further design refinement; and
- operation of ancillary facilities, laydown areas for plant and equipment, personnel and materials and collection of water to supply construction activities, from potential suitable sources.

The estimated number of culverts, underbridges and level crossings directly impacted by the enhancement works are subject to further refinement in the design process. In addition to the key features and subject to further feasibility analysis and design definition, the following will form part of the Proposal and, if so, will be assessed in the EIS:

[1] The Inland Rail project has an interface with shared environmental and heritage assets between the New South Wales and Victorian borders at the Murray River Bridge. The NSW/Victorian border is located at the top of the southern bank or left bank of the Murray River. Please refer to Guidelines for the Determination of the State Border between New South Wales & Victoria along the Murray River (Land and Property Information NSW & Natural Resources and Environment, 2001 (3rd Edition reproduced)) located: https://www.spatial.nsw.gov.au/__data/assets/pdf_file/0006/25935/NSWVic_v3.pdf

- Extension or upgrade of existing culverts to maintain current flood immunity;
- Upgrade the turnouts in enhancement sites not able to support trains moving at 80km/hr;
- Works at directly impacted public/private level crossings, and closure of crossings with stakeholder agreement; and
- Replacement and/or modification to ten rail underbridges, ten overbridges/footbridges at Junee and within enhancement sites only.

Associated works would include signalling and communications, signage, fencing, services and utilities. The construction and operation of the Proposal would also require ancillary facilities and activities which may include:

- Construction access roads and access tracks;
- Permanent and temporary changes to the road network at public level crossings for signalling, stock movement, utilities at level crossings in enhancement areas; and
- Construction compounds, storage and laydown areas.

In addition to the above subject to further feasibility analysis and design definition, the following may form part of the project scope and, if so will be assessed in the EIS:

- Mobile batch plants, located within ancillary facilities and in the rail corridor;
- Construction water supply and storage;
- Existing rail sidings will remain where near a crossing loop, a new siding may be required if a new crossing loop is required within the rail corridor;
- Stormwater drainage works will be necessary at track lowering locations and where existing drainage structures need to interface with local Council stornwater drainage at level crossings;
- Upgrade of signalling and communications;
- Changes to property/ public access roads and the local rail network;
- Flood immunity of the existing alignment, and, within enhancement sites will not be made worse. Works if necessary, will be carried out on the embankment to achieve flood immunity to 1% AEP event.; and/or
- Junctions.

Investigations, surveys, tests and sampling (including, for example, related drilling and excavations), for any purposes, including (for example) geotechnical, biodiversity, heritage, contamination and utilities and services investigations, where the investigations, surveys, tests and sampling are in connection with assessment or detailed design for the Proposal are excluded from this application.

Business as usual rail maintenance activities by ARTC such as raising and/or replacement of existing signal gantries are also excluded from this application.

1.2.2 Timing and program

Subject to planning approval construction is planned to commence in mid-2023 and will be completed by late 2024. Operations to commence in 2025.

1.2.3 Operation

Current operation

The A2I section is an existing operational passenger and freight line linking Melbourne to Sydney. Current operations of this track is estimated at 13 trains per day (ARTC, 2018).

Future operation

The A2I section is expected to have an average weekly demand of up to 20 trains per day (when operation commences in 2025) with a peak demand of up to 24 trains per day (by 2040).

Trains would continue to operate 24 hours per day and would be up to 3,600 metres in length; carry double-stacked containers up to 6.5 metres high; require a vertical clearance of 7.1 metres; and require a horizontal clearance of 3.9 m.

1.2.4 Capital investment value

The Capital Investment Value of the Proposal is in excess of $50 million.

1.3 The proponent and future operator

1.3.1 The proponent

ARTC is the proponent of the Proposal and has been tasked with developing a program to deliver Inland Rail, under the guidance of the Department of Infrastructure, Transport, Cities and Regional Development. ARTC was created after the Australian and state governments agreed in 1997 to the formation of a 'one stop shop' for all operators seeking access to the national interstate rail network. Across its rail network, ARTC is responsible for:

- Selling access to train operators;
- Development of new business;
- Capital investment in the corridors;
- Management of the network; and
- Infrastructure maintenance.

Further information on ARTC can be found at http://www.artc.com.au.

1.3.2 Future operation

The Proposal would form part of the existing rail network operated and maintained by ARTC. ARTC does not operate trains. Train services would be provided by a variety of external operators.

1.4 Purpose and structure of the report

This document contains a preliminary assessment of the Proposal and its likely environmental impacts to support the preparation of the SEARs under section 5.16 of the EP&A Act. The SEARs will be prepared by the Secretary of the DPIE in consultation with other relevant government agencies. The structure of this report is as follows:

- Section 1 – Introduction: outlines the key elements of the Proposal, and the purpose of this report;
- Section 2 – Strategic context and justification: outline of why the Proposal is required and alternatives considered;
- Section 3 – Site description: overview of the regional context of the Proposal;
- Section 4 – Planning and assessment process: outline of the statutory approvals framework for the Proposal, including applicable legislation and planning policies;

- Section 5 – The Proposal: outlines the scope of works, timeframe and likely activities involved with the Proposal;
- Section 6 – Environmental constraints: preliminary assessment of the potential impacts of the Proposal on the environment noting that there are already existing impacts associated with the existing rail line;
- Section 7 – Consultation: includes consultation undertaken to date and what is proposed during the preparation of the EIS; and
- Section 8 – Conclusion: outlines the conclusions of the document and the next steps in the process.

1.4.1 Scope of surveys

The assessment of constraints and impacts of the Proposal documented in this report are high level and indicative only. Noting there is already an existing impact associated with the existing rail line, the focus of the impact assessment is on any additional impacts associated with the Proposal.

Survey effort was limited to a rapid assessment approach and was undertaken at discrete locations based on the proposed enhancement sites to gain a general understanding of the types of species and habitat/landscape features that occur. Additional targeted survey effort would be provided in the EIS.

2 Strategic context and justification

2.1 Existing rail infrastructure

At present, the north–south rail corridor in eastern Australia runs from Melbourne to Albury, then through Sydney and to Brisbane, generally along the coast. The concept of an inland railway from Melbourne to Brisbane has been subject to significant analysis due to a number of challenges facing freight transport infrastructure in eastern Australia, including:

- The existing north–south coastal route will reach capacity in the medium term, and additional capacity will be required to service future rail freight demand for interstate and regional freight;
- Rail efficiency and service quality is currently impacting on freight productivity, resulting in higher freight transport costs for consumers;
- Road freight transport has a competitive advantage over rail, making it difficult for rail to increase its market share, with resultant potential for safety, congestion and environmental costs as a result of increased heavy vehicles on roads; and
- Rail paths on the coastal route through Sydney are shared between passenger and freight trains, impacting on the reliability of the rail freight supply chain and constraining opportunities for expansion of passenger services.

2.2 Inland Rail development history and options considered

Two major studies have been undertaken in relation to the development of an inland rail route between Melbourne and Brisbane. The first study, completed in 2006, considered potential corridors for the rail line to determine which route would deliver the best economic and financial outcome. This study identified that a 'far western corridor' linking Junee to Brisbane via Parkes would be the best option.

The second major study, the Melbourne–Brisbane Inland Rail Alignment Study (ARTC, 2010), examined the far western corridor to develop a detailed route alignment. This 2010 study was reviewed by the Inland Rail Implementation Group (IRIG) in 2015 and was found to still be accurate.

2.2.1 Melbourne–Brisbane Inland Rail Alignment Study

The commencement of the Melbourne–Brisbane Inland Rail Alignment Study was announced by the then Minister for Infrastructure, Transport, Regional Development and Local Government in March 2008. The stated purpose of the study was to determine the optimum alignment, economic benefits and likely commercial success of a new single track standard-gauge inland railway between Melbourne and Brisbane.

The study short-listed and analysed a number of route options, and the final report (released by ARTC in August 2010) identified the proposed alignment comprises a 1731 kilometre alignment between Melbourne and Brisbane:

- Melbourne to Parkes – 670 km of existing Class 1 track and 37 km of greenfield track from Illabo to Stockinbingal bypassing Cootamundra and the Bethungra Spiral;
- Parkes to North Star – 307 km of upgraded track and 291 km of greenfield track from Narromine to Narrabri; and
- North Star to Acacia Ridge – 271 km of greenfield construction, 119 km of existing track upgraded from narrow gauge to dual gauge and 36 km of the existing coastal route.

The conclusions of the study include:

- There is demand for an inland railway;
- The route for the inland railway would be more than 100 kilometres shorter than the existing coastal route;

- The preferred alignment could achieve an average Melbourne to Brisbane transit time (terminal to terminal) of less than 24 hours;
- The inland railway would free up rail and road capacity through Sydney; and
- The inland railway would achieve a positive economic net present value between 2030 and 2035, and if demand volumes grow more strongly than forecast, viability could be reached sooner.

2.2.2 Work undertaken to date

In November 2013, the Minister for Infrastructure and Regional Development announced that the Australian Government had committed $300 million to enable the development of Inland Rail to commence. This process began with pre-construction activities such as detailed corridor planning, environmental assessments and community consultation. This funding was subsequently confirmed in the 2014–15 Federal Budget paper entitled Building Australia's Infrastructure.

In 2015, ARTC produced a Program Business Case to demonstrate the viability, benefits, costs and risks associated with Inland Rail to the Australian Government for endorsement and for further approval to proceed with the delivery of the Inland Rail program.

In conjunction with the Program Business Case, the Inland Rail Implementation Group in 2015 recommended some variations to the corridor from that previously recommended in the 2010 Inland Rail Alignment Study. The report supported the development of Inland Rail and recommended that the Australian Government commit further funding in the 2016-17 Budget for the project.

The Australian Government has committed a total of $9.3 billion to deliver Inland Rail.

2.3 Strategic planning context

The Proposal is consistent with a number of state and federal strategic planning documents. These include:

- National Freight Strategy, Commonwealth of Australia, 2012;
- NSW: Making it Happen, 2015;
- NSW Long Term Transport Master Plan, Transport for NSW, 2012;
- NSW Freight and Ports Strategy, 2013;
- Rebuilding NSW – State Infrastructure Strategy, 2014;
- Murray-Murrumbidgee Regional Transport Plan, Transport for NSW, 2013 and 2014-15 update; and
- Australian Infrastructure Audit – Our Infrastructure Challenges, Infrastructure Australia, 2015.

The EIS will provide further information on relevant strategies and the relationship to the Proposal.

2.4 Need for Inland Rail

Freight transport is an essential part of Australia's economic prosperity and competitiveness and a crucial part of many Australian businesses. Freight transport in Australia has quadrupled in the last four decades and is predicted to continue to increase to nearly double the 2010 levels by 2030 (Commonwealth of Australia, 2012). This growth presents a number of challenges but also opportunities for government, industry and the community.

The 2010 Inland Rail Alignment Study report, which was prepared to determine the optimum alignment and economic benefits of Inland Rail, identified that there is demand for an inland railway and that such a railway would achieve a positive economic net present value between 2030 and 2035.

The 2010 Inland Rail Alignment Study and the National Land Freight Strategy also identified a number of constraints that face the current rail line and road freight system, including:

- The existing Sydney–Brisbane route is anticipated to reach capacity by 2052;
- Rail efficiency and service quality is inadequate and passing on higher costs to consumers;
- Inadequate rail services are also encouraging a shift to road freight causing increased congestion, maintenance, safety and environmental issues for roads and highway; and
- Priority is given to passenger modes over freight modes in urban transport corridors, adding to delays in freight rail movements.

These constraints on the current infrastructure coupled with the forecast increasing demand for freight transport indicate a clear need for Inland Rail to provide adequate and efficient freight transport across the east Australian states.

2.5 Need for the A2I Proposal

The A2I section of the Inland Rail route comprises approximately 185 kilometres of the 1700 kilometre track proposed for Inland Rail. Enhancement works in the A2I section are required to improve vertical and horizontal clearances between the tracks and infrastructure to enable trains with double-stacked containers to pass safely along the existing track.

There are two projects adjacent to the A2I Proposal; Tottenham to Albury (T2A) to the south which is also comprised of enhancement works, and Illabo to Stockinbingal (I2S) to the north which is a 'Missing Link' project, requiring new track to support the realignment to a more direct route from Acacia Ridge in Queensland to Tottenham in Victoria.

2.6 Key benefits of Inland Rail

Inland Rail will complete a significant section of the national inland rail freight network between Melbourne and Brisbane. By providing a shorter interstate route for freight that does not include travel through the congested Sydney rail network, Inland Rail will save up to 10 hours of travel time between Melbourne and Brisbane.

Trains travelling on this new, more direct route would travel at speeds up to 115 kilometres per hour, and would use significantly less fuel. Furthermore, annual carbon emissions will be reduced by 750,000 tonnes, which is a third of that used for road freight. As a result, Inland Rail would offer a road-competitive freight service that would attract existing and new freight to rail, providing a safe, efficient and sustainable alternative to road transport. By reducing train operating costs, and improving service standards, Inland Rail will be an important contributor to national productivity.

It is estimated that, by 2050, Inland Rail will remove 200,000 truck movements from roads each year. The reduction in trucks using the interstate road network would improve road safety, ease congestion and assist local councils through reduced local road maintenance requirements. In addition, by providing a second rail link between Queensland and the southern states, Inland Rail will provide additional resilience and redundancy for the existing rail network.

In summary, Inland Rail will provide the following key benefits:

- Reduction in travel time between Melbourne and Brisbane by up to 10 hours;
- A faster, cheaper, safer, less carbon intensive, more environmentally sustainable alternative to road freight;
- Provision of capacity to meet increasing freight demand;
- Creation of carryover benefits, including cost and time savings, to businesses and consumers that rely on freight;
- Creation and growth of businesses; and
- Improvements to road safety, reduced road maintenance costs and reduced congestion through reduction of road freight on interstate highways.

2.6.1 Key benefits of the A2I Proposal

The key benefits associated with the A2I section of Inland Rail include:

- Utilising existing rail corridor and infrastructure to reduce costs and environmental and social impacts while supporting the benefits of delivering the project for Inland Rail more broadly;
- Based on feedback from the community, the designs for the Kemp Street Bridge and Edmondson Street Bridge replacements will incorporate shared walkways, with separation barriers providing a significant safety improvement;
- Modifying footbridges to make them compliant with the *Disability Discrimination Act 1992 (*DDA) thereby improving accessibility for the community;
- Recording the heritage significance of heritage places and precincts; and
- Providing a shared pedestrian and cyclist path at road bridges.

2.7 Options considered

The 2010 Inland Rail Alignment Study considered four sub-corridors and identified the "Far Western Sub-Corridor" as the preferred alignment for the Project, containing two routes, via Albury or via Shepparton.

The alternate route ran from Mangalore via Shepparton, crossing the border at Tocumwal to Narrandera in the North and ran east to Junee. Much of the alternative route via Shepparton in Victoria required reconstruction of formations and full track construction, while the route via Albury is within an established and operable Class 1 freight rail line corridor.

The preferred Far Western Sub-corridor' route via Albury had the fastest transit time of 20.4 hours from Brisbane to Melbourne and a projected cost of $3.1 billion. The alternate 'Far Western Sub-corridor' had a transit time of 21.3 hours and a projected capital cost of $3.6 billion.

The A2I Proposal involves enhancement works at discrete locations to provide vertical and horizontal clearance for double-stacked containers to run between Albury to Illabo.

At each enhancement site that did not have the vertical and horizontal clearance required for double-stacked containers to safely pass along the A2I route the following treatments were considered:

- lowering, widening or shifting the track;
- raising or widening the bridges; and/or
- replacing the bridges.

Key considerations to determine whether track lowering was preferred/feasible at each site included:

- Topography (the feasibility of achieving design grade);
- Line of sight (safety);
- Operational issues such as safe egress onto platforms and associated infrastructure upgrades;
- Hydrology and hydrogeology (propensity to track flooding, environmental impacts);
- Heritage values;
- Ecological communities and remnant vegetation; and
- Disruption to rail operations.

Key considerations to determine whether bridge replacement/modification/removal was preferred/feasible at each site included:

- Land availability/potential acquisition required;
- Road / community disruption;
- Grade requirements (*Disability Discrimination Act 1992* (DDA) requirements);
- Tie-in's with other roads and infrastructure;
- Constructability complexity; and
- Heritage values.

3 Site Description

This section provides a description of the Proposal site and its regional context within central NSW (Sections 3.1 and 3.2). The existing rail infrastructure and its operation are described in Sections 3.4 and 3.5.

3.1 Regional context

The Proposal follows the existing Main South line that runs between Albury and Sydney via Goulburn and Mittagong and currently services both passenger and freight trains. The A2I portion of the line runs through the Riverina region of NSW. The Riverina is an agricultural zone of NSW, characterised by flat plains and a warm to hot climate and includes the Murray and Murrumbidgee river catchments. These catchment areas contain diverse and rich natural environments, and the waterways are a source of water supply for domestic use, extensive irrigated agriculture production, tourism, recreational activities, and hold significant cultural values.

The Proposal site crosses the Albury, Greater Hume, Lockhart, Wagga Wagga and Junee local government areas (LGAs). An overview of the social context for the five LGA's is provided in Table 6.6 below. All five LGAs are predominantly rural with the main local industries based around agriculture. The region produces fruit and vegetables crops as well as wheat, rice and livestock farming.

Sections of the Proposal are located within built-up urban areas, the most significant sections being Albury and Wagga Wagga. Junee is also noted as being a small urban centre. Other smaller villages include Gerogery, Culcairn, Henty, Yerong Creek, The Rock, Uranquinty, Bomen and Illabo as detailed below:

- Albury is a major regional city located at the southern end of the Proposal. It lies on the northern side of the Murray River at the edge of the NSW/Victorian border. It is the major retail, commercial, administrative and cultural centre for the region and at the 2016 census Albury had an urban population of 47,974;
- Gerogery is in the Greater Hume Shire local government area. This small town serves a rural farming community, which at the 2016 census had a population of 565. It is located on the Olympic Highway, 30 km north of Albury and 95 km south of Wagga Wagga;
- Culcairn is in the Greater Hume Shire local government area. At the 2016 census, this small town had a population of 1,473. It is located on the Olympic Highway, 50 km north of Albury and 78 km south of Wagga Wagga. Industries include steel fabrication, a concrete plant, Country Energy Depot, substantial grain silos and the Wet Blue Hide facility;
- Henty is in the Greater Hume Shire local government area. At the 2016 census, this small town had a population of 1,237. It is located on the Olympic Highway, 67 km north of Albury and 61 km south of Wagga Wagga;
- Yerong Creek is the oldest village in the Lockhart Shire and was first settled in the 1870's. At the 2016 census, this small town had a population of 352. It is located on the Olympic Highway, 82 km north of Albury and 46 km south of Wagga Wagga;
- The Rock is in the Lockhart local government area. At the 2016 census, this small railway town had a population of 1,236. It is located on the Olympic Highway, 98 km north of Albury and 31 km south of Wagga Wagga;
- Uranquinty is located on the Olympic Highway, 112 km north of Albury and 16 km south of Wagga Wagga. It is located within the Wagga Wagga local government area. At the 2016 census, this small town had a population of 909 and was originally used as the railway village when the railway line was being built from Wagga Wagga to Albury;

- Wagga Wagga is the largest inland city within NSW and is located within the centre of the Proposal site. It is an important agricultural, military, and transport hub. The city sits halfway between the largest cities in Australia, being 452 km southwest of Sydney and 456 km northeast of Melbourne. At the 2016 census, Wagga Wagga had an urban population of 48,263;
- Bomen is a northern suburb of Wagga Wagga with a population of just 25 (at the 2016 census). It is located 9 km north of Wagga Wagga and 28 km south of Junee;
- Junee a medium-sized town in the Riverina region. The economy is based on a combination of agriculture, rail transport, light industry and government services, and in particular correctional services. It is located on the Olympic Highway, 37 km north of Wagga Wagga and 53 km south-west of Cootamundra. At the 2016 census, Junee had a population of 4,922; and
- Illabo is a small town located at the northern end of the Proposal, 16 km north east of Junee and 32 km south west of Cootamundra. At the 2016 census, Illabo had a population of 144.

The regional context for the Proposal site is shown in Figure 1.1.

3.2 Description of the Proposal site

The A2I Proposal commences in Albury NSW and ends at Illabo. The southern end of the Proposal commences at the Murray River Rail Bridge at approximately 648.500 km on the line, measured from Central Railway Station, Sydney. Works at the Murray River Bridge will be carried out in cooperation with the Tottenham to Albury (T2A), North East Rail Line (NERL) projects and ongoing passenger, freight train activities across the NSW-Victoria border.

The Proposal then follows the existing rail corridor north for 185 km following the Main South line. Stations located along the track within the A2I Proposal site include the Albury, Bomen, Culcairn, Henty, The Rock, Wagga Wagga and Junee Stations.

3.3 Land ownership

Private land acquisition is not expected as all of the key enhancement and track slew sites are located within the rail corridor. However if required to accommodate the Proposal, ancillary facilities (including compounds, material and equipment laydown areas and installation of environmental mitigation measures) and/or the relocation of any utilities, it would be considered during the EIS process.

Some site access would be via private land, permission from the landowner would be sought where required.

3.4 Existing rail facilities

The Proposal follows the existing Main South line that runs between Albury and Sydney via Goulburn and Mittagong and currently services both passenger and freight trains. As noted above, operational stations located along the track within the A2I Proposal site include the Albury, Bomen, Culcairn, Henty, The Rock, Wagga Wagga and Junee Stations. Other facilities available on the line are outlined in Table 3.1.

Within the Proposal site, two active lines branch from the Main South line:

- The Hay Branch from Junee to Narrandera is used for various freight trains including services to Griffith, while the section further to Wilbriggie sees the haulage of seasonal grain. The line was closed from Wilbriggie to Hay in 1985; and
- The Rand branch is a short line in the far south of the state. It joins the Main South line at Henty, and heads south-west to the small town of Rand.

3.5 Passenger services

NSW TrainLink operates two services a day in each direction between Sydney and Melbourne along the line stopping at Junee, Wagga Wagga, The Rock, Henty, Culcairn and Albury Stations.

Table 3.1 Existing rail facilities within the A2I Proposal site

NAME	FACILITY	STATUS
Illabo	Station	Closed
Marinna	Station	Closed
Junee	Station	In Use
Junee Racecourse	Unknown	Closed
Harefield	Station	Closed
Shepherds	Platform	Closed
Bomen	Station	Closed
Wagga Wagga	Station	In Use
Kapooka	Station	Closed
Uranquinty	Station	In Use
Bon Accord	Station	Closed
Westby Branch	Junction	Closed
The Rock	Station	In Use

NAME	FACILITY	STATUS
Kubura	Halt	Closed
Yerong Creek	Station	Closed
Henty Junction (Rand Branch)	Junction	In Use
Henty	Station	In Use
Culcairn	Station	In Use
Gerogery	Station	Closed
Table Top	Station	Closed
Ettamogah	Station	Closed
Kinloss	Loop	Closed
Albury Racecourse	Platform	Closed
Albury	Station	In Use
Murray Bridge	Other	In Use

4 Planning and Assessment Process

4.1 Overview

The Proposal is SSI and will be assessed under Division 5.2 of the EP&A Act. In summary:

- Clause 277 of the EP&A Regulation provides that ARTC is a public authority for the purposes of Clause 79 of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP);
- Where development is permissible without consent, it can be declared to be SSI by a SEPP, usually *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP);
- Through the application of Clause 14 of the SRD SEPP, the Proposal is considered State Significant Infrastructure. In addition, as specified in Schedule 3 of the SRD SEPP, a rail infrastructure development by or on behalf of ARTC is considered SSI if it has a Capital Investment Value (CIV) greater than $50 million in accordance with Clause 14(1)(b) of the SRD SEPP;
- The Proposal is considered not to significantly affect the environmernt, under Clause 1 of Schedule 3 of the SRD SEPP;
- Under the Infrastructure SEPP, the Proposal is classified as 'development for the purpose of a railway or rail infrastructure on behalf of a public authority' and so may be carried out without development consent under the EP&A Act.

The sections below provide more detail on the EP&A Act and its operation in respect of the Proposal.

4.2 Environmental Planning and Assessment Act 1979

The EP&A Act and *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) establish a framework for the assessment and approval of developments in NSW. They also provide for the making of environmental planning instruments, including state environmental planning policies (SEPPs) and local environmental plans (LEPs), which determine the permissibility and approval pathway for development Projects and form a part of the environmental assessment process.

4.2.1 Part 5 of the EP&A Act

Part 5 of the EP&A Act defines the assessment process for projects that do not require development consent. Although the Proposal does not require development consent, it must still be subject to environmental assessment and approval. Division 5.2 outlines the environmental assessment and consultation requirements for SSI.

This document supports an application to the NSW Department of Planning, Industry and Environment (DPIE) seeking the Secretary's Environmental Assessment Requirements (SEARs) for the Environmental Impact Statement (EIS), as part of the first step in the formal assessment process for the Proposal.

4.2.2 Division 5.2 of the EP&A Act

Division 5.2 of the EP&A Act establishes an assessment and approval regime for SSI. Division 5.2 applies to development that is declared to be SSI by a SEPP or by a Ministerial order.

Under section 5.12(3), development cannot be SSI unless it is of a kind that may be carried out without development consent under Part 4 of the EP&A Act and comprises:

a) infrastructure, or
b) other development that (but for this Part and within the meaning of Part 5) would be an activity for which the proponent is also the determining authority and would, in the opinion of the proponent, require an environmental impact statement to be obtained under Part 5.

Under section 5.14 of the EP&A Act, the approval of the Minister for Planning is required for SSI before it can be carried out. In accordance with section 5.15 (Application for approval of SSI):

1) *The proponent may apply for the approval of the Minister under this Part to carry out State significant infrastructure.*
2) *The application is to:*
   a) *describe the infrastructure, and*
   b) *contain any other matter required by the Secretary.*
3) *The application is to be lodged with the Secretary.*

Under Division 5.2 of the EP&A Act, the planning and approvals process includes the following key steps:

- Submission of a State Significant Infrastructure application with the supporting document to the Secretary of the DPIE under section 5.15 of the EP&A Act, to seek the Secretary's Environmental Assessment Requirements (SEARs) - this document is the supporting document for the application;
- Preparation and submission of an EIS under section 5.16(2) of the EP&A Act, addressing the requirements of the EP&A Act and EP&A Regulation and the matters outlined in the SEARs;
- Public exhibition of the EIS for a minimum of 30 days;
- Preparation of a report by the proponent which responds to submissions and, if necessary, addresses a "preferred infrastructure" project;
- Assessment of the application and EIS by the DPIE and preparation of the Secretary's environmental assessment report (section 5.18 of the EP&A Act); and
- Determination of the application by the Minister.

Clause 192 of the EP&A Regulation requires that an application for approval of the NSW Minister for Planning to carry out SSI must include:

- Details of any approval that would, but for section 5.23 of the EP&A Act, be required for the carrying out of the SSI;
- Details of any authorisations that must be given under section 5.24 of the EP&A Act if the application is approved; and
- A statement as to the basis on which the proposed infrastructure is SSI, including, if relevant, the capital investment value of the proposed infrastructure.

Section 5.16 of the EP&A Act provides for the declaration of Critical State Significant Infrastructure (Critical SSI). Critical SSI projects are high priority infrastructure projects that are essential to the State. Section 5.16 of the EP&A Act provides that any SSI may also be declared Critical SSI, if it is 'of a category that, in the opinion of the Minister, is essential for the State for economic, environmental or social reasons'.

4.2.3 Land owner's consent

Clause 193(1) of the EP&A Regulation provides that consent of individual land owners would not be required to make the SSI application because the Proposal:

- is on behalf of a public authority, and ARTC is a public authority for the purposes of clause 193; or
- is for linear transport infrastructure.

However, the proponent must give notice of the application in accordance with clause 193(4), either:

- by notice to relevant land owners, no later than 14 days after the application has been made; or

- by advertisement published in a newspaper circulating in the area in which the infrastructure is to be carried out, at least 14 days before the EIS which relates to the infrastructure is placed on public exhibition.

4.2.4 State Environmental Planning Instruments

State Environmental Planning Policy (Infrastructure) 2007

The *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) aims to assist in the delivery of public infrastructure across the state through consistent planning and assessment regimes for public infrastructure. Clause 79 of the Infrastructure SEPP permits development on any land for 'the purpose of a railway or rail infrastructure' to be carried out on behalf of a public authority without consent', so the Proposal is permissible without consent.

Typically, the provisions of the Infrastructure SEPP prevail over other environmental planning instruments unless the work is located on land reserved under the *National Parks and Wildlife Act 1974* (NPW Act) or is regulated inconsistently by *State Environmental Planning Policy (Coastal Management) 2018* or *State Environmental Planning Policy (State and Regional Development) 2011*. As the Proposal is not located on land reserved under the NPW Act, is not subject to the Coastal Management SEPP and is subject to the SRD SEPP consistently with the operation of the Infrastructure SEPP, those exclusions would not apply.

State Environmental Planning Policy (State and Regional Development) 2011

Clauses 14 and 15 of SRD SEPP provides for SSI and clause 16 provides for Critical SSI. Clause 14 states that development is SSI if it:

- Is wholly or partly permissible without consent under Part 4 of the EP&A Act, by virtue of operation of a SEPP (such as the Infrastructure SEPP); and
- Meets the definitions provided in Schedule 3 to the State and Regional Development SEPP.

Clause 16 states that development is Critical SSI if it:

- May be carried out without development consent under Part 4 of the EP&A Act, and
- Is declared to be SSI for the purposes of the EP&A Act if it is not otherwise so declared, and
- Is declared to be Critical SSI for the purposes of the EP&A Act.

The Proposal is declared to be SSI under clause 3 of Schedule 3 of the State and Regional Development SEPP which states '*development for the purpose of rail infrastructure by or on behalf of the Australian Rail Track Corporation that has a capital investment value of more than $50 million*'. The capital investment value of the Proposal is estimated to be over $50 million so it is declared to be SSI. The Proposal will not signifcantly affect the environment, hence Cluase 1 of Schedule 3 of the SRD SEPP is not an additional SSI trigger.

4.2.5 Local Environmental Planning Instruments

The Proposal is located on land which is subject to the Albury Local Environmental Plan 2010, Greater Hume Local Environmental Plan 2012, Lockhart Local Environmental Plan 2012, Wagga Wagga Local Environmental Plan 2010 and Junee Local Environmental Plan 2012. As the Proposal is being assessed under Division 5.2 of the EP&A Act, the permissibility and consent provisions of these plans do not apply.

4.2.6 Legislation and approvals that do not apply

Section 5.23 of the EP&A Act provides that a number of additional approvals, permits or licences that would otherwise be triggered for development in NSW are not required for an approved SSI project. The approvals not required for SSI include:

- Approvals under Part 4 and excavation permits under section 139 of the *Heritage Act 1977*;
- Permits under section 201, 205 and 219 of the *Fisheries Management Act 1994*;
- Aboriginal heritage impact permits under section 90 of the *National Parks and Wildlife Act 1974*;
- A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*; and
- Bushfire safety authority under section 100B of the *Rural Fires Act 1997*.

4.2.7 Approvals to be applied consistently

Section 5.24 of the EP&A Act provides that a number of other approvals, if required for an approved SSI project, cannot be refused and must be granted on terms that are substantially consistent with the SSI approval. These approvals include:

- An environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997* (POEO Act); and
- Consent under Section 138 of the *Roads Act 1993.*

4.3 Other relevant legislation

4.3.1 Protection of the Environment Operations Act 1997

The POEO Act establishes, amongst other things, the procedures for issuing environment protection licences for specific activities relating to waste, air, water and noise pollution control. EPLs are generally required for scheduled activities or scheduled development work. There are a number of relevant scheduled activities listed under Schedule 1 of the POEO Act relating to railway activities, including Clause 33 (Railway activities–railway infrastructure construction) and Clause 33a (Railway activities–railway infrastructure operations). Further consultation will be undertaken with the EPA regarding existing EPL provisions or any future licencing requirements for the Proposal.

4.3.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) aims to maintain a healthy, productive and resilient environment, consistent with the principles of the ecologically sustainable development. The BC Act established a regulatory framework for assessing and offsetting biodiversity impacts on proposed developments and mechanisms for:

- The management and protection of listed threatened species of native flora and fauna (excluding fish and marine vegetation) and threatened ecological communities (TECs);
- The listing of threatened species, TECs and key threatening processes;
- The development and implementation of recovery and threat abatement plans;
- The declaration of critical habitat;
- The consideration and assessment of threatened species impacts in development assessment process; and
- Biodiversity Offsets Scheme, including the Biodiversity Values Map and method to identify serious and irreversible impacts (SAII).

The BC Act introduced a new consistent Biodiversity Assessment Method (BAM) required for most development types in NSW, and a Biodiversity Offset Scheme that addresses the identifiation and management of biodiversity impacts.

4.3.3 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) administered by the Heritage Division of the DPIE, protects the cultural and natural history of NSW. Protection of historic (European) heritage items includes; places, buildings, works, relics, moveable objects, precincts, historic shipwrecks and archaeological sites of State or local significance, through protection provisions and the establishment of a Heritage Council and the State Heritage Register (SHR).

4.3.4 National Parks and Wildlife Act 1974

The object of the *National Parks and Wildlife Act 1974* (NPW Act) is to consolidate and amend the law relating to the establishment, preservation and management of national parks, historic sites, certain other area, and the protection of certain fauna, native plants and Aboriginal objects.

Under the provisions of the NPW Act, all Aboriginal objects are protected irrespective of their level of significance or issues of land tenure. Aboriginal objects are defined by the Act as any deposit, object or material evidence (that is not handicraft or made for sale) relating to Aboriginal habitation of NSW, before or during the occupation of that area by persons of non-Aboriginal extraction (and includes Aboriginal remains). Aboriginal objects can include scarred trees, artefact scatters, middens, rock art and engravings as well as post-contact sites and activities such as fringe camps and stockyards.

The NPW Act also affords protection to Aboriginal places, which are defined as a place that is or was of special significance to Aboriginal culture. It may or may not contain Aboriginal objects. Aboriginal places can only be declared by the Minster. As SSI, the Proposal will not require an Aboriginal Heritage Impact Permit.

4.3.5 Roads Act 1993

Under section 138, Part 9, Division 3 of the *Roads Act 1993* (Roads Act), a person must not impact or carry out work on or over a public road other than with the consent of the appropriate roads authority. Construction of the Proposal may impact on public road reserves under the control of various authorities. The proponent would seek the necessary approvals under the Roads Act. As noted above, section 5.24 of the EP&A Act provides that a permit under section 138 of the Roads Act cannot be refused if it is necessary to carry out a SSI project.

4.3.6 Native Title (New South Wales) Act 1994

The *Native Title (New South Wales) Act 1993* provides a legislative framework for the recognition and protection of common law native title rights. Native title is the recognition by Australian law that Indigenous people had a system of law and ownership of their lands before European settlement. Where that traditional connection to land and waters has been maintained and where government acts have not removed it, the law recognises this as native title.

A search of the Register of Native Title Claims for the LGA's of Albury City Council, Greater Hume Shire Council, Lockhart Shire Council, Wagga Wagga City Council and Junee Shire Council did not yield any results for any registered claimant applications.

4.3.7 Fisheries Management Act 1994

The *Fisheries Management Act 1994* provides for the conservation, protection and management of fisheries, aquatic systems and habitats in NSW. Similar to the BC Act, the *Fisheries Management Act 1994* lists threatened species, populations and ecological communities of fish and marine vegetation. Consideration of likely occurrence of threatened fish in the waterways in the Proposal site will be provided the EIS although it is noted that the Murray River and Murrumbidgee River provide potential habitat for the Flathead Galaxias and the Macquarie Perch. The smaller ephemeral streams also provide potential habitat for the Southern Pygmy Perch.

Any waterway crossings will need to consider an appropriately designed structure that does not obstruct fish passage and will be designed in accordance with the Policy and Guidelines for Fish

Habitat Conservation and Management and the Policy (DPI, 2013a) and Guidelines for Fish Friendly Waterway Crossings (DPI, 2003). Notwithstanding this, it is noted that a permit under section 219 would not be required for waterway crossings as Section 5.23 of the EP&A Act excludes SSI projects from requiring "a permit under section 201, 205 or 219 of the Fisheries Management Act 1994".

4.4 Commonwealth legislation

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Commonwealth for proposals, or 'actions', that are likely to have a significant impact on a matter of national environmental significance (MNES) as assessed in accordance with the EPBC Significant Impact Guidelines 1.1 or the environment on Commonwealth land. An approval from the Commonwealth Minister for the Environment may be required for a referred project. If so, that project is a controlled action under the EPBC Act.

The proposed action is not on any Commonwealth land, and ARTC does not believe the proposed action will have any significant impact on the environment on any Commonwealth land.

An EPBC Act referral has been formed to seek a determination on whether the impacts of the proposed action are likely to be significant and whether the proposed action is a controlled action requiring approval under the EPBC Act. ARTC's preliminary view is that the proposed action is not a controlled action, because it is unlikely to impact on certain threatened species, populations or ecological communities that are listed under the EPBC Act. Noting there is already an existing impact associated with the existing rail line, so the focus of the impact assessment is on any additional impacts associated with the Proposal.

Should the Minister determine that the proposed action is a controlled action, it is anticipated that the bilateral agreement between the New South Wales and Commonwealth Governments under the EPBC Act will apply and will allow the Commonwealth Minister to rely on the SSI assessment process under the EP&A Act as the assessment for the purposes of the EPBC Act. If the proposal is a controlled action and the bilateral agreement does not apply, then ARTC requests that the Proposal be assessed by means of an EIS under Division 5.2 of the EP&A Act as an accredited assessment process under the EPBC Act. The requirement for any biodiversity offset will be addressed within the EIS with consideration of the EPBC Act environmental offsets policy.

4.4.2 Native Title Act 1993

The Commonwealth *Native Title Act 1993* provides the legislative framework that:

- Recognises and protects Native Title;
- Establishes ways in which future dealings affecting Native Title may proceed, and to set standards for those dealings, including providing certain procedural rights for registered Native Title claimants and Native Title holders in relation to acts which affect Native Title; and
- Establishes the National Native Title Tribunal.

The National Native Title Tribunal has a number of functions under the Act including maintaining the Register of Native Title Claims, the National Native Title Register and the Register of Indigenous Land Use Agreements and mediating Native Title claims. The NSW *Native Title Act 1994* was introduced to ensure that the laws of NSW are consistent with the Commonwealth *Native Title Act 1993*.

5 The Proposal

5.1 Overview

This section provides a brief description of the Proposal, including the infrastructure required, indicative construction activities, and the proposed operation, maintenance, and management arrangements.

The key characteristics of the Proposal (infrastructure, construction and operation) would continue to be refined and expanded following submission of this application. Further developed and updated information would be provided in the EIS.

5.1.1 Inland Rail performance specifications

The minimum operational requirements of the design are specified by the performance specification for Inland Rail.

Key elements include:

- Maximum train length of up to 1800 m with capacity for later upgrades to suit trains 3600 m long;
- Maximum design speed of 115 km/h for freight trains;
- 7.1 m clearances for double stacked operation; and
- Maximum 21 tonne axle load at 115 km/h, 25 tonnes at 80 km/h, with future proofing for 30 tonnes at 80 km/h.

5.1.2 Proposal timeframe

Subject to planning approval, construction is planned to commence in mid-2023 and complete by late 2024. Operations to commence in 2025.

This is indicative only at this stage. The construction commencement time and construction duration would be revised as the assessment of the Proposal progresses.

5.2 Scope of works

The Inland Rail project team is currently progressing the design for the Proposal. Key features of the design (subject to further design and refinement) are described below.

The enhancement works are required at four major site precincts: Albury, Wagga Wagga, Junee and Murray River Bridge to achieve the vertical (clearance of 7.1 m) and horizontal (clearance of 3.9 m) clearances required for the longer, double-stacked container trains. As outlined in Table 5.1 below, three methods are being considered at each of the four major site precincts to achieve the vertical and horizontal clearance required:

- lowering or shifting the track;
- raising or widening the bridges; and/or
- replacing the bridges.

In addition, there are several discrete sites such as Wagga Road track lowering at Ettamogah, track lowering at Pearson Street Wagga Wagga, a potential bridge replacement within the Uranquinty Track Slew Site (Sandy Creek) and the removal of a pedestrian footbridge at Culcairn.

The Proposal would also comprise of:

- approximately 26 kilometres of track slewing to allow trains vertical and haorizontal clearance at gantries and all rail corridor structures according to Inland Rail clearance specification (refer to Table 5.2);

- underbridge and culvert modifications in enhancement sites only, to allow slews to be carried out (refer to Table 5.3);
- provision of signalling infrastructure (such as signal gantry);
- aerial cable clearances (including associated overhead powerlines);
- relocation or protection of utilities (such as telecommunications, water mains, etc);
- modification of awnings at station buildings and structures (such as platforms) to maintain a safe distance from the track as currently designed and is subject to further design refinement; and
- operation of ancillary facilities, laydown areas for plant and eqipment, personnel and materials and collection of water to supply construction activities, from potential suitable sources.

The estimated number of culverts, underbridges and level crossings directly impacted by the enhancement works are subject to further refinement in the design process. In addition to the key features and subject to further feasibility analysis and design definition, the following may form part of the Proposal and, if so, will be assessed in the EIS:

- Construction of new and/or upgrade culverts and turnouts ;
- Works at directly impacted public/private level crossings; and
- Replacement and/or modification to rail underbridges at Junee and within enhancement sites only.

Associated works would include signalling and communications, signage, fencing, services and utilities. The construction and operation of the Proposal would also require ancillary facilities and activities which may include:

- Construction access roads and access tracks;
- Permanent and temporary changes to the road network at public level crossings for signalling, stock movement, utilities at level crossings in enhancement areas; and
- Construction compounds, storage and laydown areas.

In addition to the above subject to further feasibility analysis and design definition, the following may form part of the project scope and, if so will be assessed in the EIS:

- Mobile batch plants, located within ancillary facilities and in the rail corridor;
- Construction water supply and storage;
- Existing rail sidings will remain where near a crossing loop, a new siding may be required if a new crossing loop is required within the rail corridor;
- Stormwater drainage works will be necessary at track lowering locations and where existing drainage structures need to interface with local Council stornwater drainage at level crossings;
- Upgrade of signalling and communications;
- Changes to property/ public access roads and the local rail network;
- Flood immunity of the existing alignment, and, within enhancement sites will not be made worse. Works if necessary, will be carried out on the embankment to achieve flood immunity to 1% AEP event.; and/or
- Junctions.

Investigations, surveys, tests and sampling (including, for example, related drilling and excavations), for any purposes, including (for example) geotechnical, biodiversity, heritage, contamination and utilities and services investigations, where the investigations, surveys, tests and sampling are in connection with assessment or detailed design for the Proposal are excluded from this application.

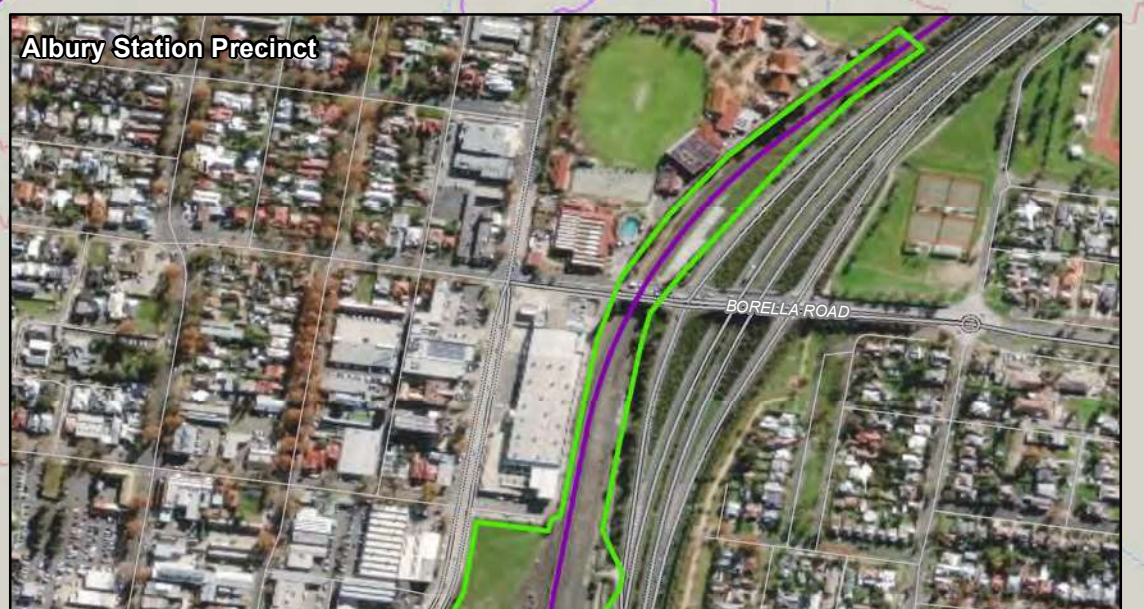
Business as usual rail maintenance activities by ARTC such as raising and/or replacement of existing signal gantries are also excluded from this application.

Table 5.1 Enhancement Sites

NO	ENHANCEMENT SITE	SITE TYPE	PHOTO	ENHANCEMENT TYPE*
MURRAY RIVER BRIDGE PRECINCT				
1	Murray River Bridge	Rail underbridge	[placeholder for photo of the enhancement sites if available]	Raise the height of the existing arches (sway braces) and reinforce the bridge.
ALBURY STATION PRECINCT				
2	Albury Station Footbridge	Footbridge	[placeholder for photo of the enhancement sites if available]	Replace the existing over-rail section of the Albury Station Footbridge. Replacement section will tie into the recently built footbridge section over the Hume Freeway.
	Albury Station Signal Box and Relay Room	Signal structures		Track slews required to clear these structures.
3	Riverina Highway Bridge	Road overbridge	[placeholder for photo of the enhancement sites if available]	Track lowering of the Through and Loop tracks under the highway and associated works including retaining structures and drainage.
	Clearance Works	Structure clearances		Track slews and provision of signalling infrastructure and aerial cable clearances.
WAGGA ROAD BRIDGE				
4	Wagga Road / Billy Hughes Bridge	Bridge	[placeholder for photo of the enhancement sites if available]	Lower the track under the highway.
CULCAIRN FOOTBRIDGE				
5	Culcairn Footbridge	Footbridge	[placeholder for photo of the enhancement sites if available]	Removal of derelict footbridge.
PEARSON STREET BRIDGE				
6	Pearson Street Bridge	Road overbridge	[placeholder for photo of the enhancement sites if available]	Lower the track underneath the bridge.
WAGGA WAGGA STATION PRECINCT				
7	Brookong Avenue Footbridge	Footbridge	[placeholder for photo of the enhancement sites if available]	Footbridge replacement.

NO	ENHANCEMENT SITE	SITE TYPE	PHOTO	ENHANCEMENT TYPE*
8	Edmondson Street Bridge	Road overbridge	[placeholder for photo of the enhancement sites if available]	Build a new bridge.
9	Mothers Bridge (Wagga Wagga Station Access Footbridge)	Footbridge	[placeholder for photo of the enhancement sites if available]	Footbridge replacement.
	Clearance Works	Structure clearances		Track slews and provision of signalling infrastructure and aerial cable clearances.
JUNEE STATION PRECINCT				
10	Kemp Street Bridge	Road overbridge	[placeholder for photo of the enhancement sites if available]	Build a new bridge that is tall enough to allow double-stacked freight trains to pass underneath
11	Junee Station Footbridge	Footbridge	[placeholder for photo of the enhancement sites if available]	Removal of derelict footbridge.
12	Olympic Highway Rail Underpass	Rail underpass	[placeholder for photo of the enhancement sites if available]	Replacement or modification of rail underbridge.
	Clearance Works	Structure clearances		Track slews, drive access paths and provision of signalling infrastructure and aerial cable clearances.

The estimated number of enhancement sites are subject to further design and refinement. The location of each site is indicated in Figure 5.1 below.



ILLABO
JUNEE
ESTELLA
WAGGA WAGGA
GUMLY GUMLY
FOREST HILL
URANQUINTY
LADYSMITH
LOCKHART
THE ROCK
HENTY
CULCAIRN
WALLA WALLA
RUMBA
JINDERA
ALBURY
MURRAY RIVER
BELLBRIDGE
WODONGA
KILLARA

Albury to Illabo

Figure 5.1 - A2I Rail Enhancement Sites and Track Slews

MAP 1 OF 5

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090
Data Sources: GA Geodata; ARTC, Inset: ESRI

LEGEND

- A2I Proposal
- Railway
- Enhancement Sites
- Track Slew
- Power Crossing
- Trackside Structures
- LGA Boundary

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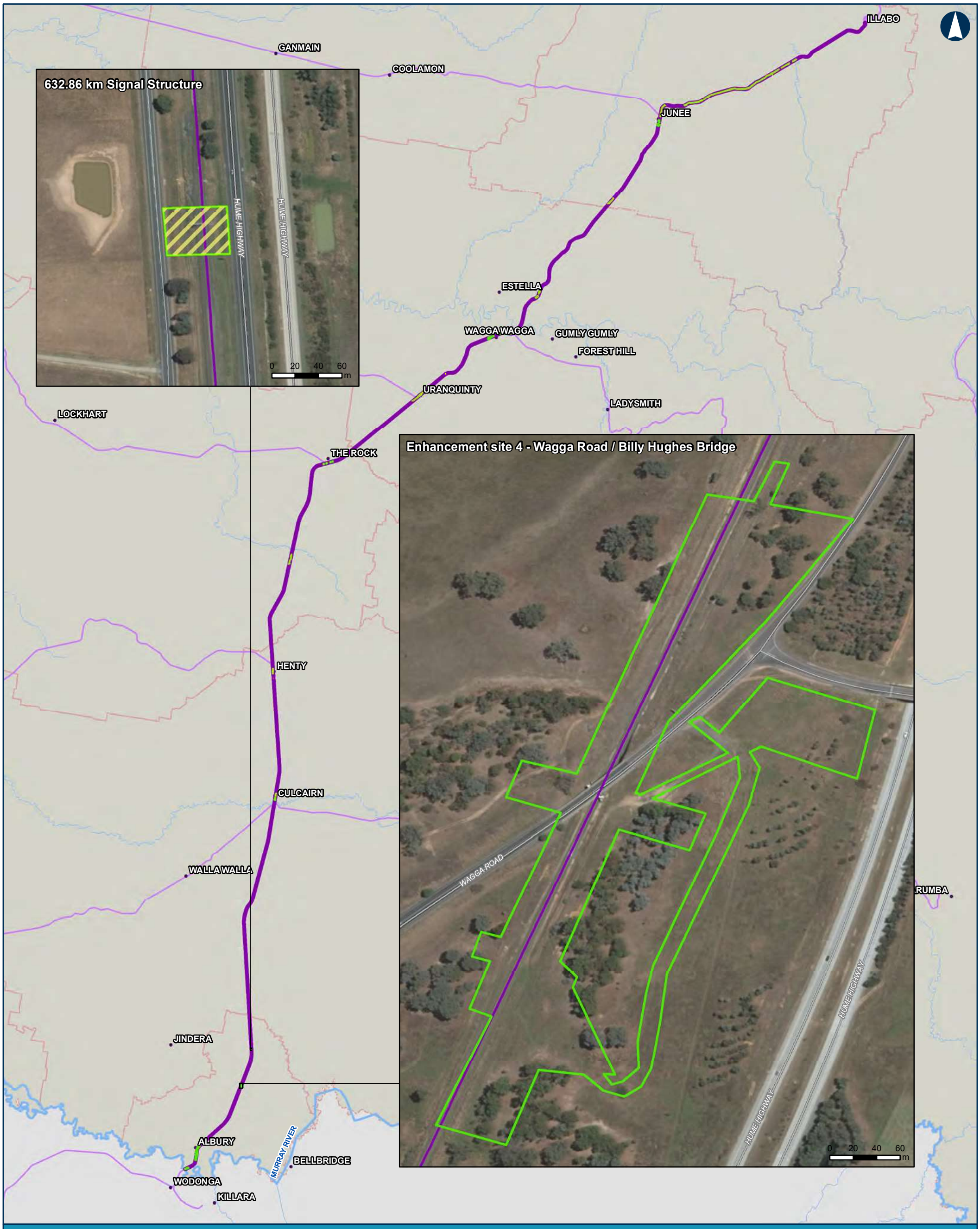

Albury to Illabo

Figure 5.1 - A2I Rail Enhancement Sites and Track Slews

MAP 2 OF 5

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090
Data Sources: GA Geodata; ARTC, Inset: ESRI

LEGEND

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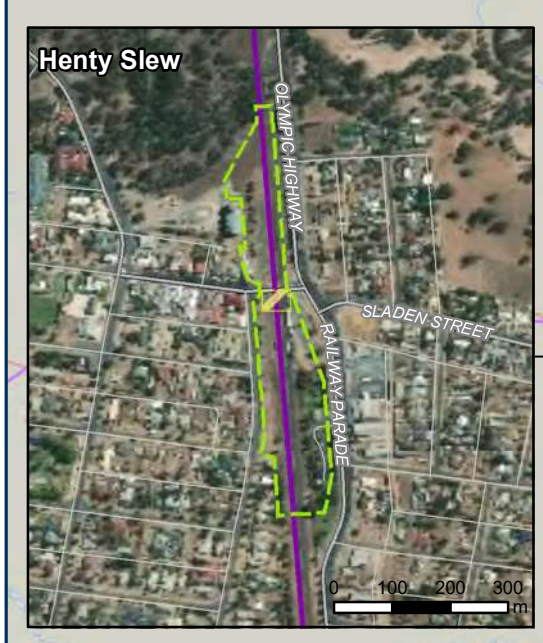

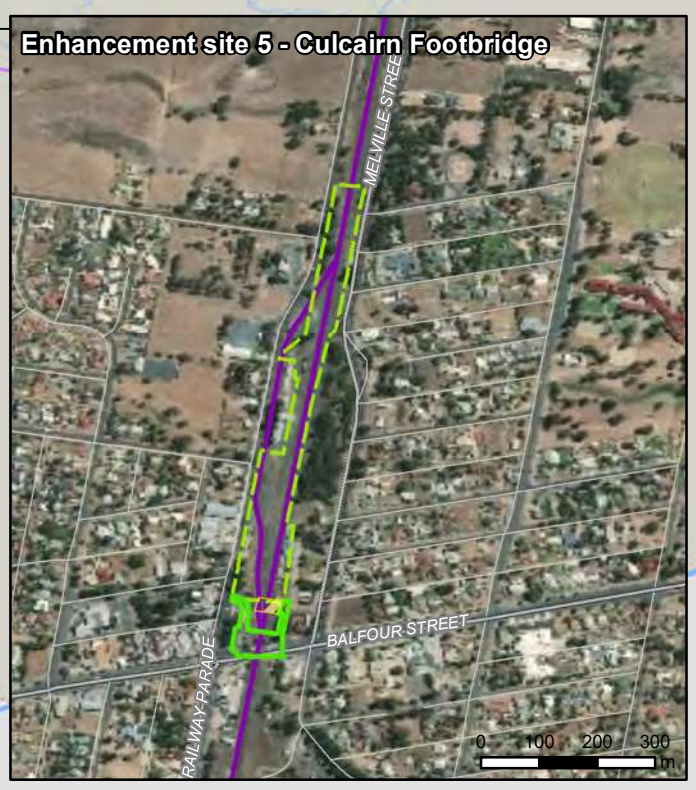

Albury to Illabo

Figure 5.1 - A2I Rail Enhancement Sites and Track Slews

MAP 3 OF 5

0 5 10 15
km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
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Data Sources: GA Geodata; ARTC, Inset: ESRI

LEGEND

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ILLABO
GANMAIN
COOLAMON
JUNEE
ESTELLA
WAGGA WAGGA
GUMLY GUMLY
FOREST HILL
URANQUINTY
LADYSMITH
LOCKHART
THE ROCK
HENTY
CULCAIRN
WALLA WALLA
JINDERA
ALBURY
MURRAY RIVER
BELLBRIDGE
WODONGA
KILLARA
UMBARUMBA

Enhancement site 6 - Pearson Street Bridge

Bomen Slew

Enhancement site 8 - Edmondson Street Bridge

Uranquinty Slew

Albury to Illabo

Figure 5.1 - A2I Rail Enhancement Sites and Track Slews

MAP 4 OF 5

0 5 10 15
km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
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LEGEND

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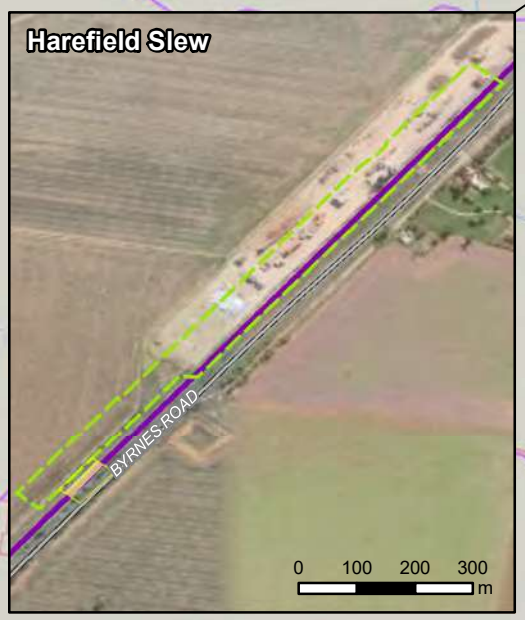

ILLABO
COOLAMON
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ESTELLA
WAGGA WAGGA
GUMI
URANQUINTY
LOCKHART
THE ROCK
HENTY
CULCAIRN
HOLBROOK
WALLA WALLA
TUMBARUMBA
JINDERA
ALBURY
WODONGA
KILLARA

Albury to Illabo

Figure 5.1 - A2I Rail Enhancement Sites and Track Slews

MAP 5 OF 5

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
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Table 5.2 Track Slew Sites

NO	TRACK SLEW SITE	FROM CHAINAGE	TO CHAINAGE	LENGTH (M)	EXTENT OF SLEW
1	Illabo to Junee	465223	480710	15,487	Minor <300 mm
2	Junee	483650	485125	1,475	Minor <300 mm
3	Harefield	497521	498500	979	Minor <300 mm
4	Bomen	513440	514590	1,150	Major >300 mm
5	Wagga Wagga	520680	521360	680	Major >300 mm
6	Uranquinty*	535100	537000	1,900	Minor <300 mm
7	Yerong Creek	564500	565700	1,200	Major >300 mm
8	Henty	580096	580750	654	Major >300 mm
9	Culcairn	596344	596818	474	Minor <300 mm
10	Albury	645460	646613	1,153	Major >300 mm
TOTAL TRACK SLEW INVESTIGATION AREA:				25,152 m	

**An ephemeral watercourse (sandy creek) intercepts the Uranquinty track slew site. Transom bridge will likely require replacement to accommodate this track slewing. It is likely that this watercourse provides important seasonal ecosystem function for local biodiversity.*
*** for the purposes of this assessment, we have assumed that the slew sites cover the entire width of railway corridor and will include provision of aerial cable clearances and laydown areas. In many cases the track slewing will be carried out on both tracks and where required the track sidings, loops and lanes associated with slew sites may be modified consistent with ARTC design.*

The estimated length of track slew sites are subject to further design and refinement (refer to Figure 5.1).

Table 5.3 Trackside Structures

TRACKSIDE STRUCTURES*	PROPOSED WORKS	AREA (HECTARE)
Signal gantry at chainage 632.86	Provision of signalling infrastructure	0.18
Signal gantry at chainage 599.360	Provision of signalling infrastructure	0.08
Signal gantry at chainage 583.076	Provision of signalling infrastructure	0.14
Signal gantry at chainage 554.226	Provision of signalling infrastructure	0.18
Signal gantry at chainage 538.413	Provision of signalling infrastructure	0.20
Signal gantry at chainage 531.256	Provision of signalling infrastructure	0.14
Signal gantry at chainage 523.871	Provision of signalling infrastructure	0.11
Signal gantry at chainage 523.683	Provision of signalling infrastructure	0.10
Signal gantry at chainage 499.145	Provision of signalling infrastructure	0.28
Signal gantry at chainage 583.99	Provision of signalling infrastructure	0.17
Signal gantry at chainage 553.841	Provision of signalling infrastructure	0.26
Signal gantry at chainage 553.319	Provision of signalling infrastructure	0.21
Signal gantry at chainage 553.040	Provision of signalling infrastructure	0.09
Signal gantry at chainage 488.892	Provision of signalling infrastructure	0.11

** Note that the estimated number and the identification of these trackside structures are subject to further design and refinement.*

5.3 Construction of the Proposal

5.3.1 Pre-construction and enabling

Pre-construction and enabling works are those activities that would typically be undertaken before the start of substantial construction in order to make ready the key construction sites and provide protection to the public. These are works that will be part of the Proposal and cannot commence until planning approval is granted. Enabling works included in this application comprise of:

- Demolishing buildings and other structures that are not a State or local heritage item;
- Supply of power, water and other services;
- Transport network modifications;
- Establishing ancillary construction facilities (including compounds), and associated mitigation measures; and
- Installation of environmental mitigation measures (including erosion and sedimentation control, temporary exclusion fencing for sensitive areas, at-property acoustic treatment).

This application does not include:

- Geotechnical, contamination and environmental investigations such as but not limited to borehole drilling or excavations, treatment of contaminated sites;
- Adjusting, modifying and protecting existing utilities and services;
- Carrying out heritage investigations, protection and archival recordings;
- Other tests, surveys, sampling or investigations of existing buildings, bridges and other third party assets; and
- Minor vegetation clearance associated with any of the works described above.

These works will be seperately assessed in accordance with the EP&A Act if required.

5.3.2 Earthworks and drainage

Bulk earthworks may be required in some sections of the Proposal site. Subject to the outcomes of the concept design process, the earthworks required could vary depending on the extent of modification required. Further investigations are currently being undertaken to confirm the extent of works likely to be required to meet the Inland Rail performance specifications.

5.3.3 Culverts and bridges

The Proposal would require the modification of existing bridges and footbridges. Modifications constisting of widening, track lowering of bridges and raising footbridges would be undertaken in agreement with the individual asset owners.Crossings over creeks may also require temporary culvert structures to maintain drainage flow and fish passegeway along watercourses. The estimated number and location of culverts and bridges would be subject to further refinement in the design process.

During the concept design process, all rail corridor structures will be assessed for compliance with the Inland Rail structural clearance performance specification. Any existing bridges and culverts that do not comply, have limited life spans, or cannot be feasibly made to comply, would also be replaced as part of the Proposal.

5.3.4 Level crossings

Level crossings are at points at which the rail alignment is at grade to the road. Level crossings have either passive or active controls to guide road users:

- Passive – have static warning signs (eg. stop and give way signs) that are visible on approach. The signage is unchanging with no mechanical aspects or light devices; and
- Active – flashing lights with or without boom barriers for motorists, and automated gates for pedestrians. These devices are activated prior to and during the passage of a train through the level crossing.

As A2I is an enhancement project comprised of works at specific enhancement sites along the line, Inland Rail will only be assessing crossings where site specific enhancement works directly impact a public or private level crossing. The A2I project will include an assessment of the potential to close any existing level crossings at the enhancement sites and, if they are to remain, demonstrate that safety will be ensured in line with the Office of the National Railway Safety Regulator (ONRSR) LX Policy (2019) and NSW Government level crossing guidelines.

The directly impacted level crossing treatments will be assessed on a case-by-case basis for design purposes, with consideration given to current and future usage of the existing crossing, the relevant Australian Standards, the road and rail geometry at the crossing location and stakeholder feedback. As part of the assessment, ARTC uses a national level crossing system called ALCAM (Australian Level Crossing Assessment Model), which considers factors such as future road traffic numbers, vehicle types, train numbers, speeds and sighting distances.

In the development of proposed treatments, ARTC will take into consideration state and national guidelines and strategies. Both the ONRSR and Transport for NSW (TfNSW) have policies which focus on avoiding building any new level crossings. Both agencies also advocate for the reduction in the number of existing level crossings, with closures noted as being the only way to completely eliminate risk at a level crossing.

The following options will be considered for each impacted level crossing:

- Consider crossing consolidation based on the outcomes of further investigation and stakeholder agreement;
- Grade separation;
- Retaining crossing as is;
- Retain crossing and refurbish; and
- Upgrade the level of control at the crossing eg. from passive to active controls.

Any closure of level crossings needs to be undertaken in accordance with requirements for the *Transport Administration Act 1998*. Legal private level crossings cannot be closed unless there is an alternative means of legal access to the property and the landowner has agreed to close.

For public crossings, ARTC will undertake the necessary consultation with TfNSW and local councils in relation to the preferred road rail interface treatments for each impacted location. Part of this process is to work with the relevant road manager to understand the local environment and gather information on future development plans, which can be used to inform design. If any changes are proposed to private level crossing, ARTC will consult with the private landowner directly.

5.3.5 Construction sequence

Construction activities would vary along the length of the Proposal depending on the works to be undertaken, local conditions and track operational requirements. A typical construction sequence is as follows:

- Establish construction work sites and environmental controls;
- Undertake enabling works, including the excavation, installation and relocation of services;
- Remove existing structures and vegetation clearing;
- Construct new structures (footbridges, road bridges, rail underbridges);
- Modify rail bridge/s;
- Track slewing works including as required:
  - Construction of cuts and fills; and
  - Installation of track components and ballast.
- Installation of signalling infrastructure and other services;
- Commissioning works; and
- Site rehabilitation.

The anticipated construction methodology and sequencing will be identified in EIS.

5.3.6 Ancillary works activities

Ancillary works may include works to signalling and communications, signage, fencing, and services and utilities. During construction, the Proposal would require the establishment of construction compounds. Larger compounds would be located preferably within ARTC leased areas however some may need to be located adjacent to the Proposal site where there is insufficient space available or for safety reasons. They would be located on disturbed land, close to existing access roads and clear of sensitive environmental areas and residences as far as possible.

A number of smaller storage areas would be required at strategic locations adjacent to and within enhancement sites, for example near bridges.

In addition to the construction compounds, which are subject to further feasibility analysis and design definition in the EIS, the following may form part of the project scope:

- Mobile batch plants;
- Construction water supply and storage;
- Rail sidings;
- Stormwater drainage;
- Upgrade of signalling and communications;
- Changes to property/ public access roads and the local rail network;
- Flood immunity works; and/or
- Junctions.

It is noted construction of the Proposal is also likely to require storage areas for railway materials.

The location and impacts of potential ancillary works activities, including the need for the above, will be considered in the EIS and refined during the design process.

5.4 Operation of the Proposal

The A2I section is expected to have an average weekly demand of up to 18 trains per day (when operation commences in 2025) with a peak demand of up to 24 trains per day (by 2040). The new rail line will be a faster, more efficient route that bypasses the Sydney rail network and will enable the use of double-stacked trains along its entire length.

Trains would operate 24 hours per day and would be up to 1,800 m in length; carry double-stacked containers up to 6.5 m high; require a vertical clearance of 7.1 m; and require a horizontal clearance of 3.9 m.

5.5 Maintenance activities

Standard ARTC maintenance activities would be undertaken during operations. Typically these activities would involve minor maintenance works such as bridge and culvert inspections, through to major maintenance such as reconditioning of track and topping up of ballast as required.

6 Environmental Consideration

6.1 Overview

This section provides a preliminary assessment of the potential environmental impacts that are likely to be associated with the construction and operation of the Proposal. This assessment has been based on the current level of design for the Proposal. Some impacts may change as the design progresses and more detail becomes available. These changes would be considered as the environmental impact assessment process continues and the EIS is prepared.

The environmental issues identified in this section have been classified as either 'key' or 'other' environmental issues. This classification was based on the likely significance of the identified environmental impacts from the findings of the preliminary investigations undertaken for the Proposal and experience with other similar projects.

ARTC will undertake key issue assessments, supported by prepared specialist reports with project specific mitigation measures, which will be presented in the EIS. The 'Key' issue assessments are considered in Sections 6.2 to 6.9 and will include:

- Biodiversity (section 6.2);
- Aboriginal heritage (section 6.3);
- Non-Aboriginal heritage (section 6.4);
- Hydrology, flooding and water quality (section 6.5);
- Topography, geology and soils (section 6.6);
- Land use, socio-economic and visual issues (section 6.7);
- Noise and vibration (section 6.8); and
- Traffic and transport (section 6.9).

The 'Other' environmental issues are defined as those impacts that are manageable through the application of industry standard environmental management measures. These issues are considered in Section 6.10–6.18 and include:

- Air quality (section 6.10);
- Contamination (section 6.11);
- Waste and resource use (section 6.12);
- Greenhouse gas and energy (section 6.13);
- Climate change (section 6.14);
- Hazards and risks (section 6.15);
- Utilities and services (section 0);
- Cumulative impact (section 6.17); and
- Sustainability (section 6.18).

6.2 Biodiversity

A Biodiversity Assessment Report (BAR) has been prepared to support this Scoping Report, which identifies and describes the key biodiversity values within the Proposal site and provides preliminary recommendations.

The following section provides a summary of the results from a preliminary biodiversity assessment of the 12 enhancement sites (as well as 10 track slews and 14 trackside structures) by ERM in September 2019 (refer to Appendix A). The assessment included a desktop assessment and literature review to identify threatened flora and fauna species, populations and ecological communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and EPBC Act that may be impacted by the Proposal. This was supported by a rapid field survey at each of the enhancement sites (including track slews and trackside structures) to provide additional detail on key biodiversity values across the A2I Proposal site. The rapid surveys were designed to verify and refine the presence/absence of biodiversity constraints within the Proposal site.

6.2.1 Existing Environment

The general landscape within the locality is largely cleared, agricultural landscape with small remnant woodland associated with riparian and roadside corridors. Key landscape features and biodiversity values within the Proposal site are summarised in Table 6.1 below.

Table 6.1 Summary of Landscape Features and Biodiversity Values

LANDSCAPE FEATURE	SUMMARY NOTES
IBRA Bioregion	NSW South West Slopes Bioregion
Vegetation	The works will be confined to the existing rail corridor, and the vast majority of the A2I Proposal site is within the existing rail corridor and is subject to regular rail maintenance activities (e.g. mowing and herbicide treatment), track developments and influences from surrounding agriculture, industrial and urban areas.. This ongoing disturbance has resulted in the A2I Proposal site being almost exclusively non-remnant vegetation characterised predominately by non-native grasslands. Exotic flora and invasive flora species were regularly found throughout the A2I Proposal site. Small pockets of riparian and semi-cleared open woodland persists in isolated pockets only and include Threatened Ecological Communities (TEC) listed under the BC Act. The broader region of the A2I Proposal has also been subject to extensive clearing for agriculture, industry and urban uses.
Threatened Ecological Communities (TEC)	One TEC has been recorded within the Proposal site: the NSW BC Act listed White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland). All areas of Box Gum Woodland Threatened Ecological Community (TEC) will be avoided during detailed design and will be clearly delineated in the field and on all construction drawing as a no go zone. Further management and mitigation measures will be detailed in the BDAR and EIS. Refer to Figure 6.1 These areas are not considered White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC listed under the EPBC Act as they do not meet the condition criteria. Specifically, they do not contain a predominantly native understorey and field survey confirmed less than 50% native species in the ground layer.

LANDSCAPE FEATURE	SUMMARY NOTES
Threatened species	Known: ▸ Squirrel Glider (*Petaurus norfolcensis*); ▸ Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) (pers. comm David Sharpe); and ▸ Superb Parrot (*Polytelis swainsonii*). Likely: ▸ Hoary Sunray (*Leucochrysum albicans var. tricolor*); ▸ White-throated Needletail (*Hirundapus caudacutus*); ▸ Sloane's Froglet (*Crinia sloanei*); ▸ Little Lorikeet (*Glossopsitta pusilla*); ▸ Major Mitchell's Cockatoo (*Lophochroa leadbeateri*); ▸ Turquoise Parrot (*Neophema pulchella*); ▸ Diamond Firetail (*Stagonopleura guttata*);and ▸ Grey-headed Flying-fox (*Pteropus poliocephalus*).
Areas of Geological Significance	There are no karst, caves, crevices, cliffs or other areas of geological significance within the Proposal site.
Areas of Outstanding Biodiversity Value (AOBV)	There are no Areas of Outstanding Biodiversity Value (AOBV) within the A2I Proposal site.
High Biodiversity Values Map	The A2I Proposal site includes two areas considered of high biodiversity value in accordance with the NSW Biodiversity Values Map: ▸ Murray River Bridge - Enhancement Site 1 (Riparian Vegetation); and ▸ Uranquinty Track Slew Site (Riparian Vegetation). The A2I Proposal site is not located within any state, national or internationally protected areas.
Aquatic habitat	The A2I Proposal site is located within the Murray – Darling Basin and covers two sub-catchments, which include the Mid Murray and Murrumbidgee. Due to the linear nature of the Proposal, the A2I Proposal site is intercepted and in close proximity to many watercourses, drainage features, wetlands, artificial dams and canals. Watercourses include major rivers such as the Murray River and several minor streams. Refer to Figure 6.4. Field surveys did not aim to assess aquatic fauna and flora communities, rather aimed to identify aquatic areas with high biodiversity value. These included: ▸ riparian and aquatic habitat along the Murray River and Oddies Creek would be important for local aquatic fauna and flora ▸ Pearson Street Road Overbridge -Enhancement Site 6 incorporates one (1) artificially constructed wetland and is immediately adjacent to another artificially constructed wetland. Although these are not natural features, they are considered important for local aquatic fauna and flora. ▸ an ephemeral watercourse (Sandy Creek) intercepts the Uranquinty Track Slew Site and may require a bridge replacement. It is likely that this watercourse provides important seasonal ecosystem function for local biodiversity. ▸ Henty Track Slew Site, Culcairn Track Slew Site, Olympic Highway Footbridge and many of the trackside structures are all located in close proximity to vegetated wetland and vegetated watercourses.

LANDSCAPE FEATURE	SUMMARY NOTES
Hollows and Hollow Bearing Trees	The riparian vegetation at Murray River Bridge - Enhancement Site 1 contained many large hollow logs and some dead woody vegetation, which could provide refuge habitat to a range of fauna species. Wagga Road Bridge - Enhancement Site 4 also contained some small hollow logs that could be used has habitat for reptile and small mammal species. Hollow bearing trees were recorded at Pearson Street Road Overbridge - Enhancement Site 6, Bomen Track Slew Site and the Junee to Illabo Track Slew Site. These trees are likely provide important biodiversity benefits, particularly for birds and arboreal mammals.

6.2.1.1 Threatened Ecological Communities

Three (3) Box Gum Woodland patches intercept the A2I Proposal Site at Wagga Road Bridge - Enhancement Site 4. Enhancement Site 4 was predominately cleared and subject to a range of disturbances such as vehicle tracks, invasive flora infestations, noise pollution and soil erosion. These woodland patches aligned with the species composition and community structure of the Box Gum Woodland TEC as listed under the BC Act based on the following reasons:

- Located within NSW South West Slopes;
- Vegetation patches would likely respond to assisted natural regeneration;
- White Box, Yellow Box or Blakely's Red Gum, or a combination of these species, are or were present; and
- The site is predominantly grassy.

The total area of White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) TEC within the Proposal site itself is 0.45 ha and the entire area will be avoided during detailed design. This area must be clearly delineated in the field and on all construction drawings as a no go zone. Further management and mitigation measures will be detailed in the BDAR and EIS.

These three (3) woodland patches could also not be considered a TEC under the EPBC Act because the areas inspected did not 'have a predominately native understorey'. Field survey confirmed less than 50% native species in the ground layer.

During the field surveys, an additional three (3) woodland patches in close proximity to the A2I Proposal site were also identified as potential TEC. These were located adjacent to the Junee – Illabo Track Slew Site and at the Culcairn Track Slew Site.

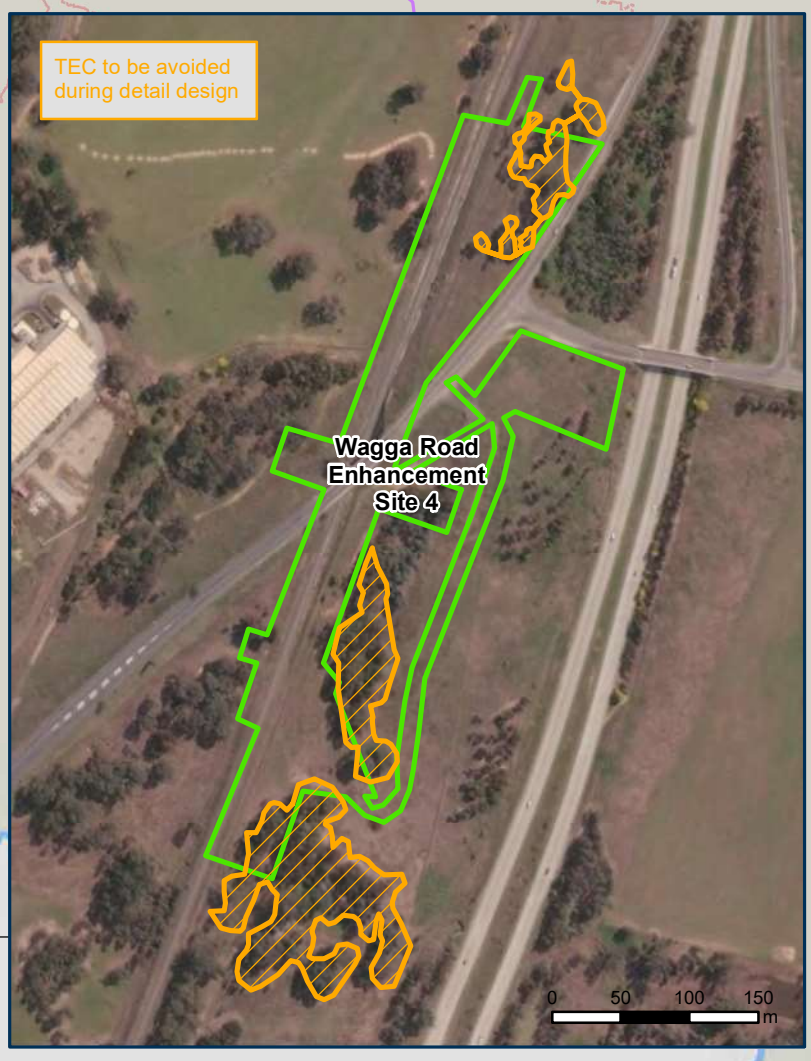
6.2.1.2 Threatened Species

One (1) conservation significant species was identified during the field surveys: the Superb Parrot (*Polytelis swainsonii*). A total of six (6) Superb Parrot individuals including both females and males were detected within and immediately adjacent to the A2I Proposal site. Five individuals were detected within 250m of the Harefield Track Slew Site and one (1) individual was detected in the Illabo to Junee Track Slew Site.

Plate 1: Male Superb Parrot

Plate 2: Female Superb Parrot

Desktop assessment also identifies an additional two (2) threatened species known to occur and nine (9) threatened species considered likely to occur within the A2I Proposal site. Field surveys and detail assessment would be undertaken to support the EIS to confirm presence of threatened (and migratory) species and their habitat within the Proposal site.



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JUNEE SHIRE COUNCIL
ESTELLA
GUMLY G
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URANQUINTY
WAGGA WAGGA CITY COUNCIL
LOCKHART
THE ROCK
LOCKHART SHIRE COUNCIL
HENTY
CULCAIRN
HOLBROOK
GREATER HUME SHIRE COUNCIL
WALLA WALLA
JINDERA
ALBURY CITY COUNCIL
ALBURY
MURRAY RIVER
BELLBRIDGE
WODONGA
KILLARA

Albury to Illabo Figure 6.1 - Threatened Species and Ecological Communities recorded within the Proposal site MAP 1 OF 1

0 5 10 15
km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090
Data Sources: GA Geodata; Inset : Bing; ESRI World Imagery

LEGEND
- Superb Parrot Sighting
- LGA Boundary
- Threatened Ecological Community (TEC)
- A2I Proposal Site
- Railway
- Major River
- Enhancement Sites
- Track Slew

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6.2.2 Matters of National Environmental Significance

Based on the results of the desktop assessment and the field survey, a preliminary assessment of Matters of National Environmental Significance (MNES) within the A2I Proposal site has been provided in Table 6.2.

Table 6.2 MNES within the A2I Proposal site (known and likely)

MNES	RELEVANCE TO THE A2I PROPOSAL SITE
World heritage properties	There are no world heritage properties within the A2I Proposal site.
National heritage properties	There are no national heritage properties within the A2I Proposal site.
Wetlands of international importance	There are no wetlands of international importance associated with the A2I Proposal site.
Threatened species and ecological communities	Threatened Species (Known): ▸ Superb Parrot (*Polytelis swainsonii*). Threatened Species (Likely): ▸ Sloane's Froglet (*Crinia sloanei*); ▸ White-throated Needletail (*Hirundapus caudacutus*); ▸ Hoary Sunray (*Leucochrysum albicans var. tricolor*); and ▸ Grey-headed Flying-fox (*Pteropus poliocephalus*). *Note: None of the vegetation communities recorded within the A2I Proposal site are consistent with any of the EPBC listed TEC due the highly disturbed groundcover (<50% native). They will be addressed under the BC Act only. They will not be the subject of any EPBC referral.*
Migratory species	Likely: ▸ Fork-tailed Swift (*Apus pacificus*); and ▸ White-throated Needletail (*Hirundapus caudacutus*).
Commonwealth marine area	There are no Commonwealth marine areas within the A2I Proposal site
The Great Barrier Reef Marine Park	N/A to this Proposal
Nuclear actions	N/A to this Proposal.
Water resources	N/A to this Proposal.

The findings of preliminary environmental investigations carried out to date have confirmed the presence of threatened species listed under the EPBC Act in the Proposal site. Therefore, the Proposal is being referred to the Australian Government Minister for the Environment through the preparation of a separate referral.

An EPBC Act referral has been prepared to seek a determination on whether the impacts of the Proposal is likely to be significant and whether the proposed action is a controlled action requiring approval under the EPBC Act. ARTC's preliminary view is that the proposed action is not a controlled action, because it is unlikely to impact on threatened species, populations or ecological communities which are listed under the EPBC Act.

6.2.3 Potential impacts

Based on the results of the desktop assessments and field surveys undertaken to date, the main potential impacts of the Proposal include:

- 0.45 ha of BC Act listed White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) mapped at Wagga Road - Enhancement Site 4 will be avoided during detailed design. This area must be clearly delineated in the field and on all construction drawings as a no go zone. Further management and mitigation measures will be detailed in the BDAR and EIS.

- Clearance of <0.5 ha of isolated and regrowth woodland trees;
- Loss of some, albeit limited fauna habitat and impacts on local populations of threatened species, including the Superb Parrot which was confirmed on site during the field surveys;
- Disturbance to natural and constructed aquatic habitats;
- Increased habitat fragmentation; and
- Increased potential for wildlife to be struck by the potential higher frequency of trains and use of double deck rolling stock. The squirrel glider in particular will require detailed assessment and mitigation. The design of any recommended glider poles must consider:
  - potential habitat within the locality to identify 'hot spots' for installation of crossings; and
  - gliding ability to determine the required pole height and distance between poles, allowing for clearance of double-stacked containers.

Potential indirect impacts may result from the Proposal and include:

- Changes to hydrology through run off, sedimentation and erosion from construction works;
- Soil or water contamination from construction incidents/spills;
- Construction and operational noise, light and vibration impacts; and
- Increased edge effects (specifically spread of weeds) and any inadvertent impacts on adjacent habitat or vegetation.

Given the high levels of disturbance within the A2I Project site, there is also the risk that weeds may be transported off-site. Mitigation measures to reduce the chance of weed spread should be considered within the EIS.

6.2.4 Scope of further assessment

Based on the investigations undertaken to date, the following recommendations are provided for additional survey(s) to provide further detail on biodiversity features/values and to inform the EIS.

- Avoid areas of TEC where possible during detailed design;
- To better understand the use of the A2I Proposal site by Superb Parrots, Squirrel Glider and Grey-crowned Babbler, additional surveys and detailed habitat assessments (including mapping of key habitat resources) is recommended;
- Undertake a detailed habitat assessment and fauna survey, which includes targeted survey methods for species considered likely to occur;
- Survey the A2I Proposal site for bat roosts and roost zones. This would be limited to the bridges within the enhancement sites as well as hollow bearing trees to be removed;
- Undertake targeted amphibian searches within the areas of suitable habitat; and
- Undertake detailed floristic surveys within the small areas (<1 ha total) of native vegetation (woodland remnants) in accordance within the Biodiversity Assessment Methodology (BAM).

While the risk of significant impacts is considered unlikely, the potential impact of the Proposal on threatened species and communities listed under the BC Act and the EPBC Act will need to be considered as part of the EIS in accordance with the EP&A Act.

Given that significant impact on threatened species is unlikely within the already highly disturbed operational alignment, ARTC would like to seek a determination from the Secretary under section 7.9(2) of the BC Act:

> *"Any such application [SSI] is to be accompanied by a biodiversity development assessment report unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values."*

If such a determination is made, the impacts to threatened species will still need to be considered in the EIS, but not in the form of a BDAR. In addition, Section 7.14 of the BC Act, would not apply.

6.3 Aboriginal heritage

6.3.1 Existing environment

The South Western Slopes was traditionally Wiradjuri country, the largest Aboriginal language group in NSW. Wiradjuri means 'people of the three rivers' - the Macquarie, Lachlan and Murrumbidgee.

Searches of the NSW Aboriginal Heritage Information Management System (AHIMS) were undertaken on 11 September 2019. These searches aimed to identify known Aboriginal heritage sites within or in proximity of the Proposal site. A total of 11 searches were undertaken across the length of the Proposal site, identifying 383 Aboriginal heritage sites.

Of these 383 sites, 30 are within or in close proximity (<200 m) to the Proposal site (refer to Figure 6.2). The detailed searches are provided in Appendix B. A total of 30 known sites were identified in close proximity to the Proposal site, based on desktop searches alone. The sites consist of Artefacts (isolated finds or scatters), some with associated areas of Potential Archaeological Deposit (PAD), resource and gathering sites and culturally modified trees. All sites are recorded as being ‘Valid’ (i.e. intact), although aerial imagery indicates some of these valid sites may have been destroyed through development or construction. Consultation with Aboriginal stakeholders will take place prior to establishing ancillary facilities and carrying out any other activities, outside the rail corridor.Proposed track slews will take place, within the rail corridor only. Additional surveys will be undertaken outside the rail corridor prior to any activities likely to impact potential arcaheological deposits.

6.3.2 Potential Impacts

Whilst it is noted that the works will be largely confined to the existing rail corridor, based on the results of the AHIMS searches it has been identified that the proposed works have potential to result in impacts to known Aboriginal heritage sites across the Proposal site.

It would be necessary to undertake further archaeological survey work and assessment during the EIS, to ensure that recorded and potential archaeological sites and archaeologically sensitive landforms are assessed and managed appropriately.

6.3.3 Scope of further assessment

An Aboriginal cultural heritage and archaeology assessment would be prepared as part of the EIS in accordance with the Guide to Investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH, 2011) and the following guidelines:

- Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW, 2010c);
- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011);
- Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010a); and
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010b).

The assessment would include consultation with the relevant stakeholders and Aboriginal parties, including Native Title parties.

The assessment would describe and assess the significance of any Aboriginal objects and/or places that may be impacted by the Proposal and provide options to avoid, mitigate or manage the harm to those object and/or places.

6.4 Non-Aboriginal heritage

6.4.1 Existing Environment

To identify Non-Aboriginal heritage constraints surrounding the Proposal site, the following statutory registers were searched:

- NSW State Heritage Register (SHR);
- Junee Local Environmental Plan 2012;
- Wagga Wagga Local Environmental Plan 2010;
- Lockhart Local Environmental Plan 2012;
- Greater Hume Local Environmental Plan 2012;
- Albury Local Environmental Plan 2010; and
- Australian Rail Track Corporation Section 170 Heritage Register.

Preliminary searches of these registers identified 102 Non-Aboriginal Heritage sites within or adjacent to (within 200m buffer) the Proposal site (refer to Figure 6.3). The results of the searches are summarised in Table 6.3 below.

ILLABO
GANMAIN
COOLAMON
COOLAMON SHIRE COUNCIL
NARRANDERA SHIRE COUNCIL
JUNEE
JUNEE SHIRE COUNCIL
COOTAMUNDRA-GUNDAGAI REGIONAL COUNCIL
ESTELLA
WAGGA WAGGA
GUMLY GUMLY
FOREST HILL
URANQUINTY
WAGGA WAGGA CITY COUNCIL
LADYSMITH
LOCKHART
THE ROCK
TARCUTTA
LOCKHART SHIRE COUNCIL
HENTY
CULCAIRN
HOLBROOK
GREATER HUME SHIRE COUNCIL
SNOWY VALLEYS COUNCIL
WALLA WALLA
TUMBARUMBA
NSW
JINDERA
ALBURY CITY COUNCIL
MURRAY RIVER
VIC
ALBURY
BELLBRIDGE
WODONGA
KILLARA

Albury to Illabo

Figure 6.2 - Known Aboriginal Heritage sites within 200m of the Proposal site

MAP 1 OF 1

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090
Data Sources: GA Geodata; ARTC, Inset: ESRI

LEGEND

- Railway
- A2I Proposal Site
- LGA Boundary
- Aboriginal Places
- Impact Area (Enhancement Site, Power Crossing, Slew)
- Aboriginal Ceremony and Dreaming
- Aboriginal Ceremony and Dreaming, Modified Tree (Carved or Scarred)
- Aboriginal Resource and Gathering
- Artefact Scatter
- Artefact Scatter, Modified Tree (Carved or Scarred)
- Artefact Scatter, Potential Archaeological Deposit (PAD)
- Isolated Find
- Isolated Find, Potential Archaeological Deposit (PAD)
- Modified Tree (Carved or Scarred)
- Potential Archaeological Deposit
- Stone Quarry
- Stone Quarry, Artefact
- Water Hole

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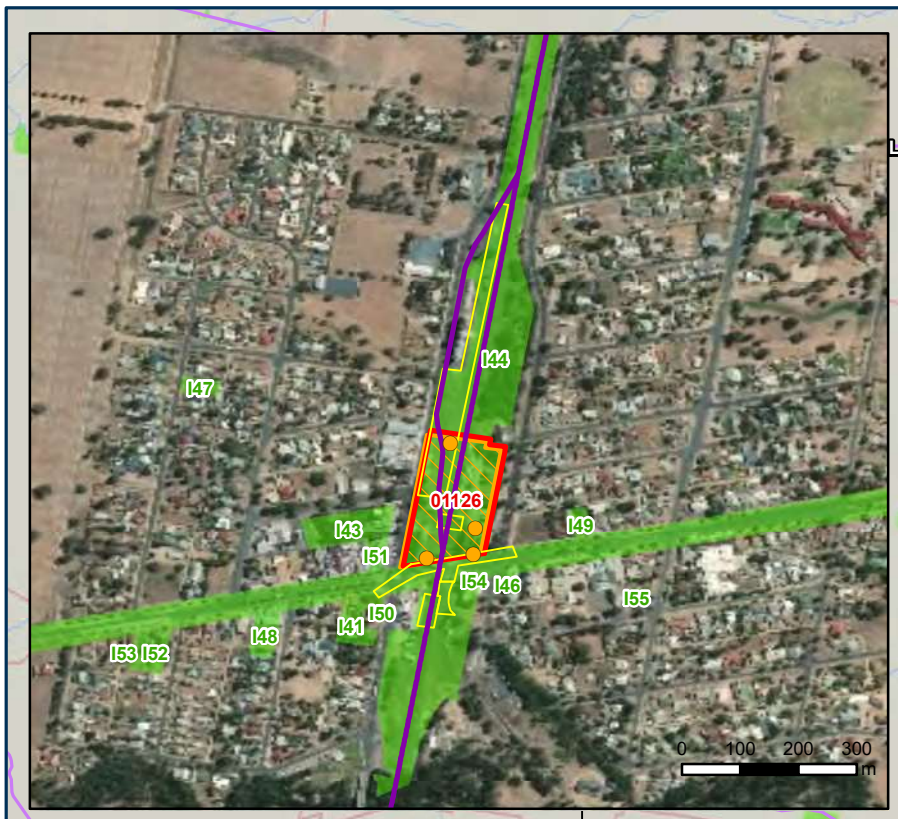

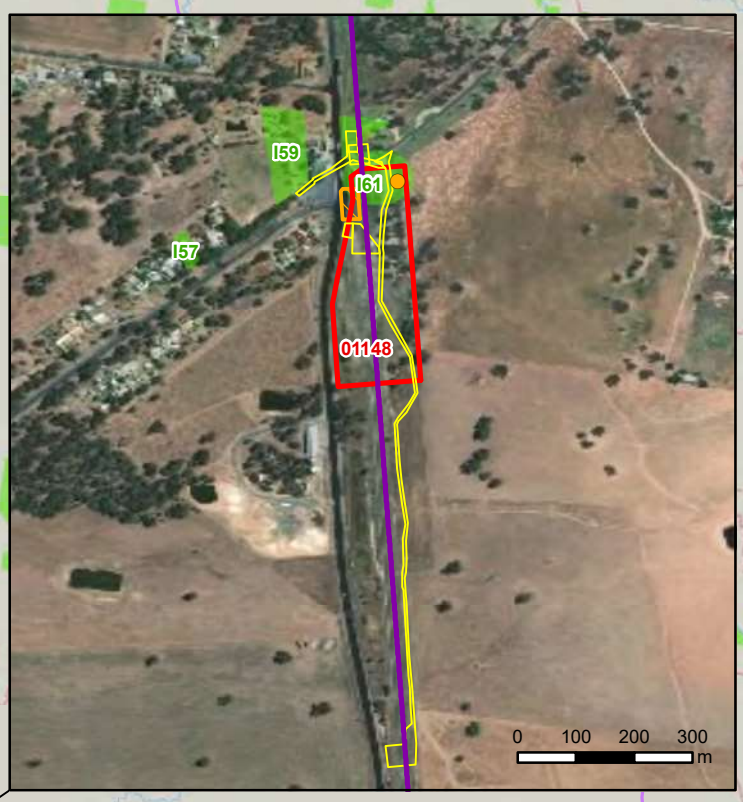

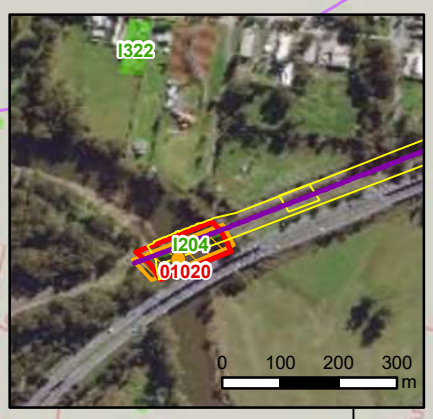

ILLABO
LAMON
JUNEE
ESTELLA
WAGGA WAGGA
GUMLY GUMLY
FOREST HILL
URANQUINTY
LOCKHART
THE ROCK
HENTY
CULCAIRN
HOLBROOK
WALLA WALLA
TUMBARUMBA
ALBURY
MURRAY RIVER
BELLBRIDGE
WODONGA
KILLARA

Albury to Illabo

Figure 6.3 - Historic Heritage sites within 200m of the A2I Proposal site

MAP 1 OF 4

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090

Data Sources: GA Geodata; ARTC, OEH, Inset: ESRI

LEGEND

- A2I Proposal Site
- Railway
- Impact Area (Enhancement Site, Power Crossing, Track Slew)
- s.170 Heritage Site
- s.170 Heritage Area
- State Heritage Register Area
- Local Heritage Conservation Area
- Local Heritage Item
- LGA Boundary

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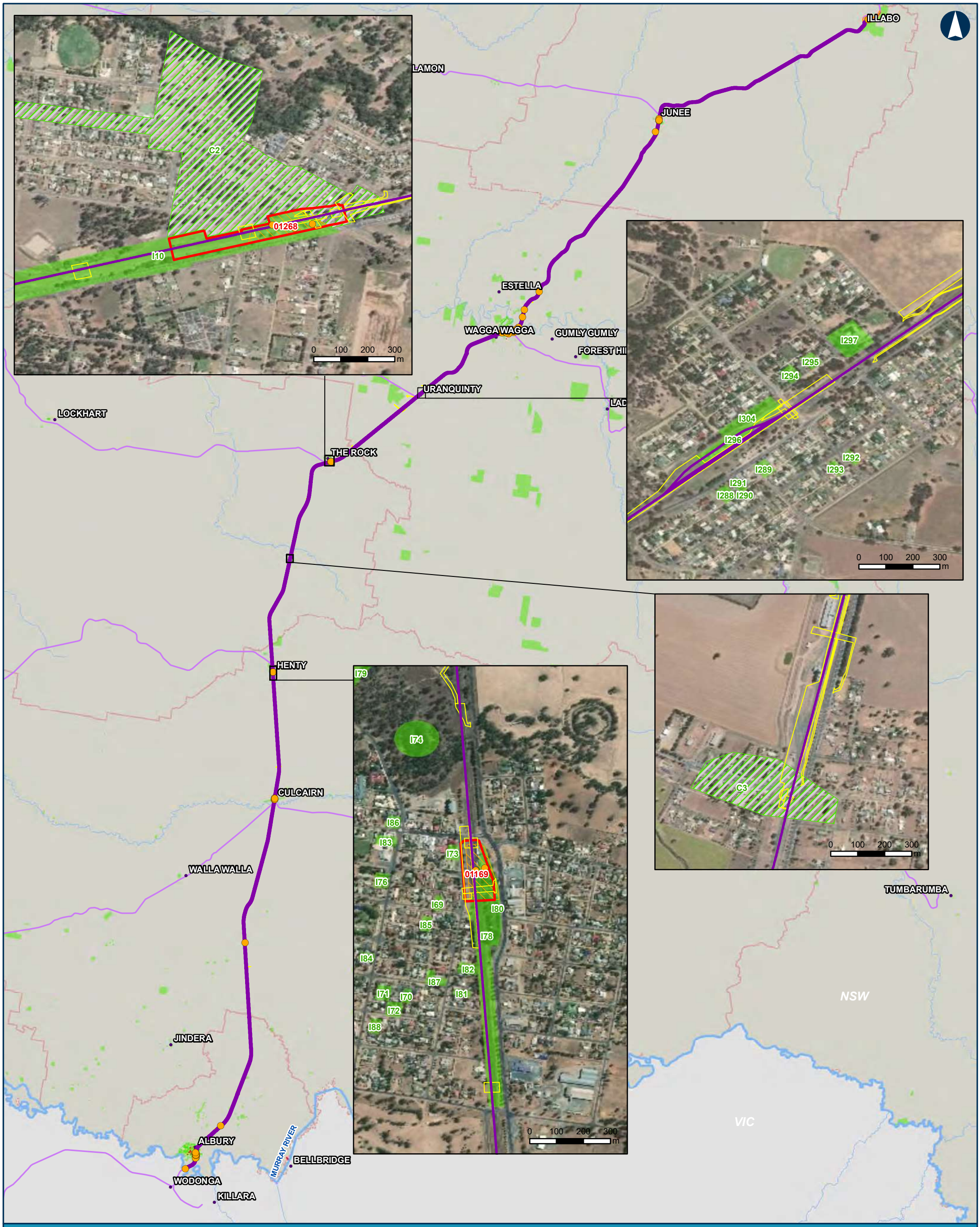

Albury to Illabo

Figure 6.3 - Historic Heritage sites within 200m of the A2I Proposal site

MAP 2 OF 4

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090

Data Sources: GA Geodata; ARTC, OEH, Inset: ESRI

LEGEND

- A2I Proposal Site
- Railway
- Impact Area (Enhancement Site, Power Crossing, Track Slew)
- s.170 Heritage Site
- s.170 Heritage Area
- State Heritage Register Area
- Local Heritage Conservation Area
- Local Heritage Item
- LGA Boundary

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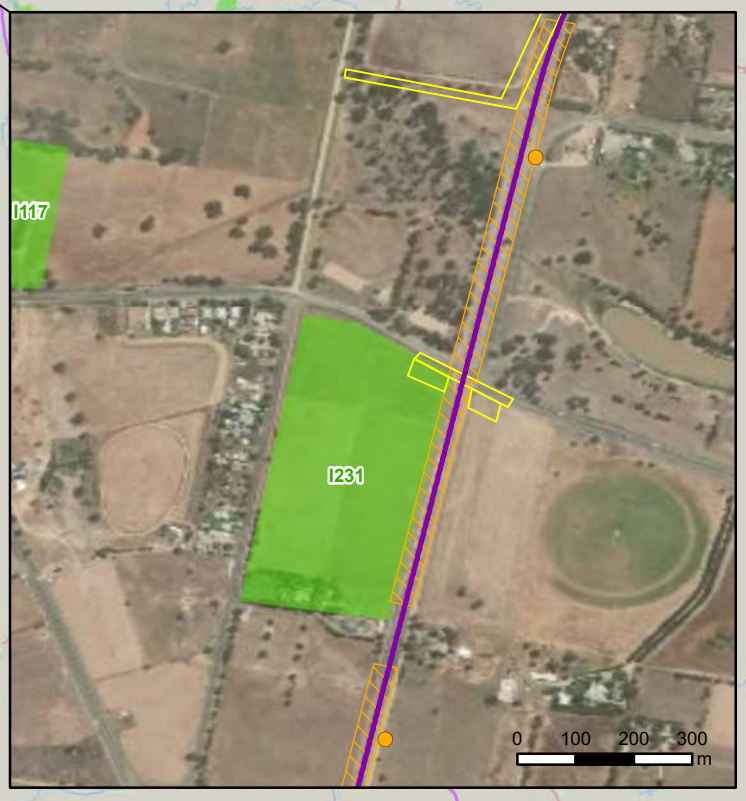

Albury to Illabo

Figure 6.3 - Historic Heritage sites within 200m of the A2I Proposal site

MAP 3 OF 4

0 5 10 15
km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090

Data Sources: GA Geodata; ARTC, OEH, Inset: ESRI

LEGEND

- A2I Proposal Site
- Railway
- Impact Area (Enhancement Site, Power Crossing, Track Slew)
- s.170 Heritage Site
- s.170 Heritage Area
- State Heritage Register Area
- Local Heritage Conservation Area
- Local Heritage Item
- LGA Boundary

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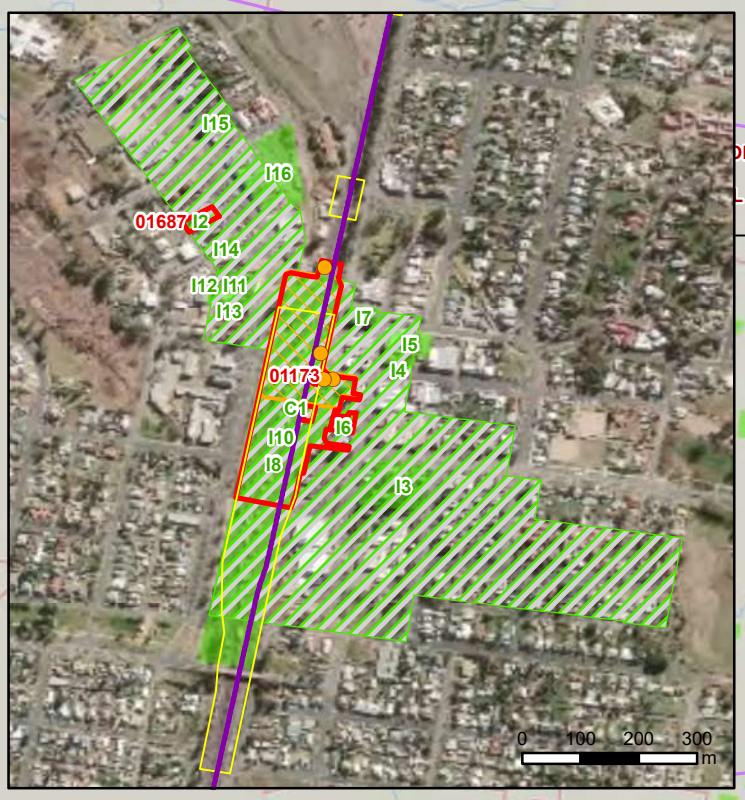

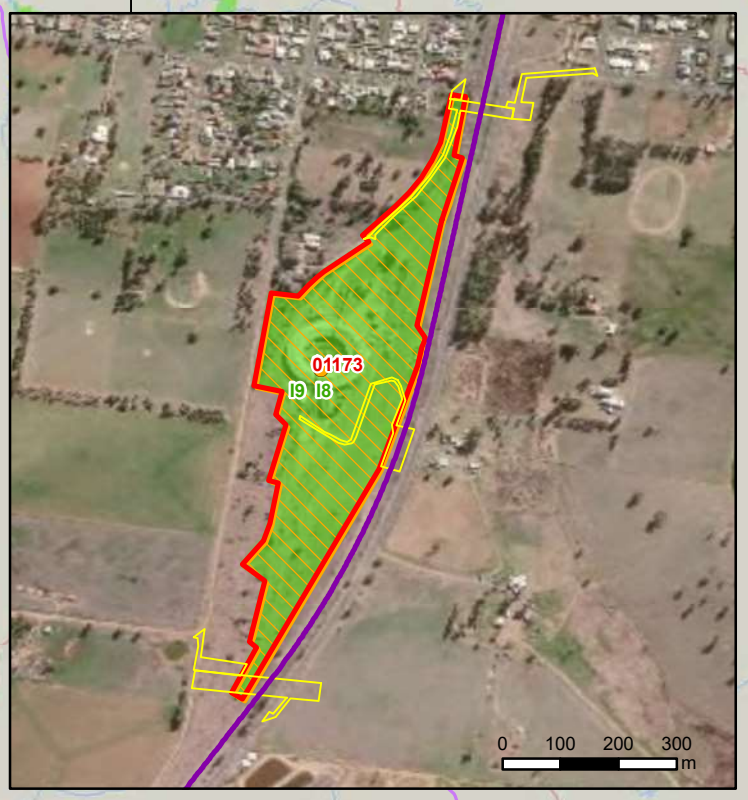

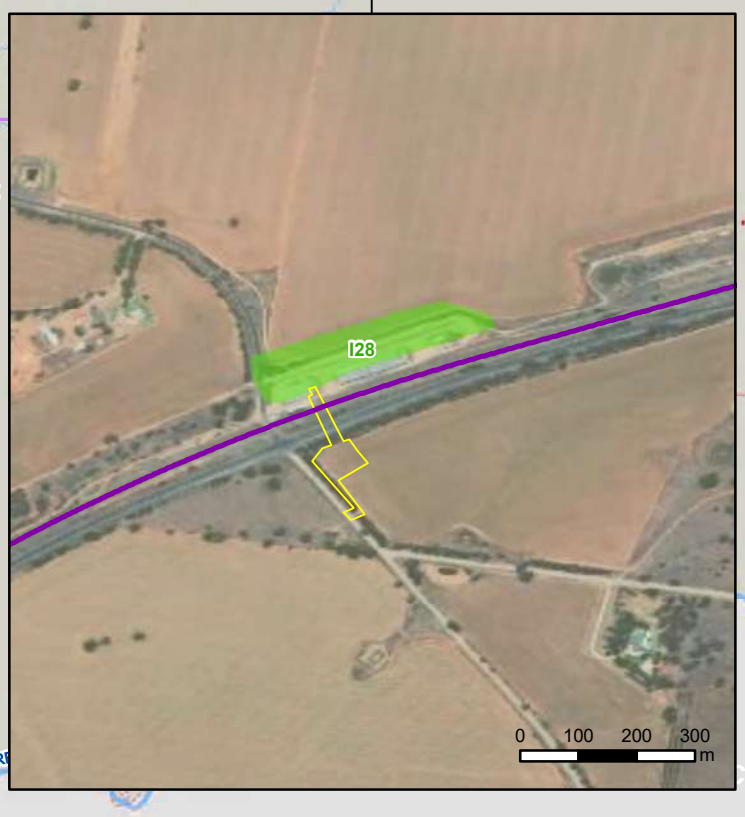

ILLABO
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JUNEE SHIRE COUNCIL
COOTAMUNDRA-GUNDAGAI REGIONAL COUNCIL
ESTELLA
WAGGA WAGGA
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WAGGA WAGGA CITY COUNCIL
LOCKHART
THE ROCK
LOCKHART SHIRE COUNCIL
HENTY
CULCAIRN
GREATER HUME SHIRE COUNCIL
WALLA WALLA
SNOWY VALLEYS COUNCIL
TUMBARUMBA
NSW
JINDERA
ALBURY CITY COUNCIL
ALBURY
BELLBRIDGE
WODONGA
KILLARA

Albury to Illabo

Figure 6.3 Historic Heritage sites within 200m of the A2I Proposal site

MAP 4 OF 4

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:455,090

Data Sources: GA Geodata; ARTC, OEH, Inset: ESRI

LEGEND

- A2I Proposal Site
- Railway
- Impact Area Impact Area (Enhancement Site, Power Crossing, Track Slew)
- s.170 Heritage Site
- s.170 Heritage Area
- State Heritage Register Area
- Local Heritage Conservation Area
- Local Heritage Item
- LGA Boundary

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Table 6.3 Identified non-Aboriginal heritage sites within 200m

LOCATION	SITE NAME	LISTINGS	PROXIMITY TO PROPOSAL SITE
Albury	Albury rail bridge over Murray River	NSW SHR – 01020 Albury LEP – I204 ARTC s.170	Within
Albury	Albury Railway Station and yard group	NSW SHR – 01073 Albury LEP – I206 / C13 ARTC s.170	Within
Albury	Transhipment Shed	Albury LEP – I208	Within
Albury	Signal Box, footbridge	Albury LEP – I207	Within
Albury	Railway Turntable	Albury LEP – I209	Within
Albury	Railway Conservation Area	Albury LEP – C13	Within
Albury	Station Master's Residence	Albury LEP – I205	45 m west
Albury	Railway Workers Hut	Albury LEP – I210	100 m west
Albury	Houses (532-536 Young Street)	Albury LEP – I211	Within
Albury	Houses (540 Young Street)	Albury LEP – I212	60 m west
Albury	Bunge Flour Mill	Albury LEP – I213	Within
Albury	Remnant Box Gum Woodland	Albury LEP – I334	162 m north-west
East Albury	Houses (347–381 Kenilworth Street)	Albury LEP – I74	88 m east
East Albury	Kenilworth Street Conservation Area	Albury LEP – C9	90 m east
East Albury	Hanel Street Conservation Area	Albury LEP – C8	85 m east
East Albury	Houses (371–379 Rau Street)	Albury LEP – I135	85 m east
East Albury	House (378 Rau Street)	Albury LEP – I136	95 m east
East Albury	Houses (Hanel Street)	Albury LEP – I69	90 m east
East Albury	Corner Store	Albury LEP – I134	158 m east
East Albury	House (369 Rau Street)	Albury LEP – I133	157 m east
East Albury	House "Grestford"	Albury LEP – I132	161 m east
East Albury	House (375 Wilson Street)	Albury LEP – I180	130 m east
East Albury	House (371 Wilson Street)	Albury LEP – I179	145 m east
East Albury	House (363 Wilson Street)	Albury LEP – I177	190 m east
East Albury	Houses (368-376 Wilson Street)	Albury LEP I178	120 m north-east
Albury	Houses (420-424 Wilson Street)	Albury LEP – I185	150 m north-west
Albury	House "Cumnock"	Albury LEP – I184	167 m north-west
Albury	Shop	Albury LEP – I186	185 m north-west
Albury	Dean Street Conservation Area	Albury LEP – C6	185 m west
North Albury	Race Course Building	Albury LEP – I319	170 m south-east
Table Top	Maryvale	Albury LEP – I310	80 m south-east
Gerogery	Gerogery Railway Station Group	Greater Hume LEP – I61	Within
Gerogery	Gerogery Hotel	Greater Hume LEP – I59	5 m north-west
Gerogery	Gerogery Commemoration Hall	Greater Hume LEP – I57	175 m south-west

LOCATION	SITE NAME	LISTINGS	PROXIMITY TO PROPOSAL SITE
Gerogery	Gerogery Gatekeepers Residence	ARTC s.170	5 m south
Culcairn	Culcairn Railway Station and yard group	NSW SHR – 01126 Greater Hume LEP – I44 ARTC s.170	Within
Culcairn	Post Office	Greater Hume LEP – I50	Within
Culcairn	Court House, Police Station Building	Greater Hume LEP – I41	20 m west
Culcairn	London Bank	Greater Hume LEP – I46	30 m south
Culcairn	Papworth's Bakery Shop	Greater Hume LEP – I49	90 m east
Culcairn	Scholz's Corner	Greater Hume LEP – I51	35 m north
Culcairn	Culcairn Hotel	Greater Hume LEP – I43	45 m south-west
Culcairn	Memorial Hall & School of Arts	Greater Hume LEP – I48	140 m south-west
Culcairn	Town Well	Greater Hume LEP – I55	175 m south-east
Henty	Henty Railway Station and yard group	NSW SHR – 01169 Greater Hume LEP – I78 ARTC s.170	Within
Henty	Methodist Church	Greater Hume LEP – I82	60 m south
Henty	Masonic Hall	Greater Hume LEP – I81	170 m south
Henty	St Barnabas Anglican Church	Greater Hume LEP – I87	150 m south-west
Henty	Shop (former)	Greater Hume LEP – I85	121 m west
Henty	Brick House	Greater Hume LEP – I69	67 m west
Henty	Doodle Cooma Arms Hotel	Greater Hume LEP – I73	15 m west
Henty	Government Dam	Greater Hume LEP – I74	100 m south-west
Henty	Henty Showground Stables and Gate	Greater Hume LEP – I79	180 m west
Lockhart	Yerong Greek Urban Conservation Area	Lockhart LEP – C3	Within
The Rock	The Rock Station and yard group	NSW SHR – 01268 Lockhart LEP – I10 ARTC s.170	Within
The Rock	The Rock Urban Conservation Area	Lockhart LEP – C2	Within
Uranquinty	Uranquinty Silos	Wagga Wagga – I296	Within
Uranquinty	Memorial Avenue	Wagga Wagga LEP – I304	20 m north
Uranquinty	Ganawarra	Wagga Wagga LEP – I294	50 m north-west
Uranquinty	Uranquinty Hall	Wagga Wagga LEP - I295	50 m north
Uranquinty	Uranquinty School	Wagga Wagga LEP – I297	50 m north-west
Uranquinty	St Patrick's Roman Catholic Church	Wagga Wagga LEP – I288	90 m south-east
Uranquinty	Uranquinty General Store Post Boxes	Wagga Wagga LEP – I291	90 m south-east
Uranquinty	Uranquinty Hotel	Wagga Wagga LEP – I289	90 m south-east
Uranquinty	Uranquinty Cemetery	Wagga Wagga LEP – I286	190 m south-east
Wagga Wagga	Wagga Wagga Conservation Area	Wagga Wagga LEP	Within

LOCATION	SITE NAME	LISTINGS	PROXIMITY TO PROPOSAL SITE
Wagga Wagga	Wagga Wagga Railway Station and yard group	NSW SHR – 01279 Wagga Wagga LEP – I98 ARTC s.170	Within
Wagga Wagga	Former Docker Street Railway Gatehouse	Wagga Wagga LEP – I257	Within
Wagga Wagga	Wagga Wagga (521.7km) Footbridge	ARTC s.170	Within
Wagga Wagga	Wagga Wagga, Tarcutta Street Underbridge	ARTC s.170	10 m north
Wagga Wagga	Wagga Wagga Viaducts	ARTC s.170	40 m north
Wagga Wagga	Mt Erin Convent, Chapel, High school and Grounds	Wagga Wagga LEP – I260	Within
Wagga Wagga	Former Best Street Railway Gatehouse	Wagga Wagga LEP – I254	Within
Wagga Wagga	South Wagga Public School	Wagga Wagga LEP – I97	Within
Wagga Wagga	Former Station Master's Residence	Wagga Wagga LEP – I99	Within
Wagga Wagga	Murrumbidgee Milling Company Flour Mill (former) and outbuildings	Wagga Wagga LEP – I100	10 m north
Wagga Wagga	Residence (18-20 Docker Street)	Wagga Wagga LEP – I258	150 m north
Wagga Wagga	Wagga Wagga Showgrounds, Kyeamba Smith Hall and grandstand	Wagga Wagga LEP – I246	Within
Wagga Wagga	Charles Sturt University South Campus	Wagga Wagga LEP – I245	165 m south-east
Wagga Wagga	Residence (108 Coleman Street)	Wagga Wagga LEP – I244	50 m south-east
Wagga Wagga	Residence (100 Coleman Street)	Wagga Wagga LEP – I243	80 m south-east
Wagga Wagga	Robertson Oval, gates and ticket boxes	Wagga Wagga LEP – I265	Within
North Wagga Wagga	Springfield	Wagga Wagga LEP – I231	Within
Bomen	Bomen Railway Station	NSW SHR – 01093 Wagga Wagga LEP – I8 ARTC s.170	Within
Brucedale	Shepherds concrete silos	Wagga Wagga LEP – I28	Within
Junee	Junee Railway Station, yard, locomotive depot	NSW SHR – 01173 Junee LEP – I8 ARTC s.170	Within
Junee	Junee Railway Station movable relics	NSW SHR – 01172 Junee LEP – I9	Within
Junee	Junee Railway Refreshment Rooms	Junee LEP – I10	Within
Junee	Junee Heritage Conservation Area	Junee LEP – C1	Within
Junee	Junee Courthouse	Junee LEP – I3	90 m east
Junee	Junee Post Office	Junee LEP – I6	30 m east
Junee	Former Westpac Bank, Bank of NSW	Junee LEP - I4	85 m east
Junee	Commercial Hotel	Junee LEP – I5	85 m east
Junee	Humphrys on Loftus (former Loftus Hotel)	Junee LEP – I7	25 m east
Junee	Former Solicitors Office	Junee LEP – I13	45 m west
Junee	Filewood's (former General Store)	Junee LEP – I12	45 m west

LOCATION	SITE NAME	LISTINGS	PROXIMITY TO PROPOSAL SITE
Junee	Junee Hotel	Junee LEP – I11	50 m north-west
Junee	ANZ Bank	Junee LEP – I14	120 m north-west
Junee	Athenium Theatre (former Jadda Centre)	Junee LEP – I2	180 m north-west
Junee	Broadway Stores Group	Junee LEP – I16	75 m west

6.4.2 Potential Impacts

Based on the results of the statutory register searches it has been identified that the Proposal would have potential to result in impacts to known heritage sites. Impacts may include:

- Temporary visual impacts;
- Long-term visual impacts;
- Removal of significant items such as the footbridges;
- Dust and vibration impacts; and
- Permanent modification of significant items or works. This includes the potential trimming of the awning at Bomen Railway Station.

Preliminary Heritage Reports were prepared during early concept feasibility phase at the following locations:

- Albury Station Footbridge;
- Murray River Bridge, Albury;
- Culcairn Station Footbridge; and
- Selected Signal Structures.

It is noted that the proposed works at each of these sites remains unmodified, and the Preliminary Heritage Reports can provide background information during the preparation of the EIS.

6.4.3 Scope of further assessment

A historical heritage assessment would be prepared in accordance with relevant standards and guidelines, including the NSW Heritage Manual 1996, Archaeological Assessments and Assessing Heritage Significance and with consideration of the principles contained in the Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance.

Individual SoHI reports should be prepared for proposed enhancement works at:

- Albury Track Slew;
- Bomen Railway Station;
- Enhancement Site 12 - Olympic Highway Rail Underpass, Junee;
- Trackside structures (including signal gantries); and
- Track slews at various locations.

6.5 Hydrology, flooding and water quality

This section provides a preliminary hydrology, flooding and water quality assessment for the Proposal. The assessment included a review of relevant literature such as the Murrumbidgee catchment overview (Office of Water, 2011) and relevant regional Floodplain Risk Management Studies, to identify and evaluate existing hydrologic and hydraulic conditions within the Proposal site. Albury, Greater Hume, Lockhart, Wagga Wagga and Junee LEPs have also been reviewed to identify watercourses, flood prone land and groundwater vulnerability.

6.5.1 Existing environment

6.5.1.1 Surface water

The Proposal is located within the Murray-Murrumbidgee catchment which is a sub-catchment within the Murray Darling Basin. The Proposal stretches from the Murray River, north to the Murrumbidgee River intersecting Wagga Wagga, and further north to Illabo remaining wholly within the Murray-Murrumbidgee catchment. The Proposal crosses two rivers (Murray River and Murrumbidgee River) and includes 21 creek crossings (refer to Figure 6.4).

There are approximately 100 active river gauges within the Murrumbidgee catchment recording flows on a continuous basis. Many of the gauges located at major towns along the river have been established since the 1880s, including the gauge at Wagga Wagga. Although influenced by the regulation effects of upstream dams since 1928, long term flows at Wagga Wagga provide an insight into how runoff patterns in the Murrumbidgee catchment have varied over time. Daily streamflows provide an indication of the variability of flow patterns and the peak height of flood events.

6.5.1.2 Groundwater

Groundwater is an important source of water for industry and agriculture in the Murrumbidgee catchment. The groundwater and surface water systems in the catchment have a range of connectivity which vary from being highly connected, with the relationship changing seasonally, to longer term variations or permanently disconnected. The interaction is influenced by surface and groundwater use, climate and flood frequency, significance and duration. Most upland streams in the catchment are hydraulically connected, receiving flow from fractured rock aquifers (Office of Water, 2011).

6.5.1.3 Flooding

A review of the relevant regional Floodplain Risk Management Study and other plans developed for Albury City, Greater Hume Shire Council, Lockhart Council, Wagga Wagga City Council and Junee Shire Council (WMA 2016; WMA 2017a; WMA 2017b; WMA 2014; WMA 2018) reveals the region is characterised by low-lying floodplains which experiences regular inundation. Flooding likelihood is heavily concentrated along the Murray River, Murrumbidgee River, Billabong Creek and other local waterways, as shown in Figure 6.4.

There have been several large flood events in Wagga Wagga, the largest of these being in 1891, 1925, the 1950s and 1974.

CULCAIRN
BILLABONG CREEK
BURKITTS CREEK
TEN MILE CREEK
BACK CREEK
Km 600.0
RED CREEK
MOUNTAIN CREEK
NATIVE DOG CREEK
PETRIES CREEK
Km 605.0
WALLA WALLA
BURRUMBUTTOCK CREEK
MOUNTAIN DAM CREEK
PRETTY GULLY
Km 610.0
SNAKE GULLY
DALY CREEK
MIDDLE CREEK
Km 615.0
YAMBLA CREEK
FOUR MILE CREEK
MARYVALE CREEK
620.0
Km 625.0
TABLE TOP CREEK
YELLOW CREEK
SANDY CREEK
MURRAY RIVER
0 100 200 300 m
Km 630.0
NINE MILE CREEK
Hume Reservoir
Km 635.0
STONY GULLY
BLACKSPRINGS CREEK
WOOLSHED CREEK
Km 640.0
SPLITTERS CREEK
EIGHT MILE CREEK
Km 645.0
ALBURY
MURRAY RIVER
BELLBRIDGE

Albury to Illabo

Figure 6.4 - Watercourses and Flood Prone Land

MAP 1 OF 4

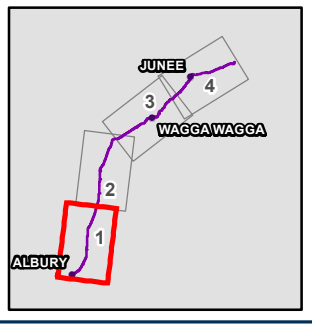
0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:144,600
Data Sources: GA Geodata, EPI, DLPI DTDB, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major Watercourse
- Minor Watercourse
- Flood Prone Land
- Riparian Lands and Watercourses
- Wetland



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Km 545.0
Km 555.0
THE ROCK
Km 550.0
STONY CREEK
Lake Gilman
BULLENBONG CREEK
PINE CREEK
MCCLOUDS CREEK
Km 560.5
WATTLE CREEK
DEADMANS GULLY
YERONG CREEK
SANDY CREEK
BURKES CREEK
Km 565.0
Grubben Swamp
MITTAGONG CREEK
TIMS CREEK
BINNI CREEK
MUNDAWADDERY CREEK
Km 570.0
BACK CREEK
HATCHETTS CREEK
Km 575.0
JORDAN CREEK
KANGAROO GULLY
Km 580.0
HENTY
URANGELINE CREEK
Doodle Corner Swamp
Km 585.0
COMER CREEK
O'NEILLS CREEK
Km 590.0
MAJORS CREEK
KANGAROO CREEK
Km 595.0
CULCAIRN
BILLABONG CREEK
RED CREEK
BURKITTS CREEK
WILLOW BEND CREEK

BILLABONG CREEK
0 50 100 150 m

Albury to Illabo

Figure 6.4 - Watercourses and Flood Prone Land

MAP 2 OF 4

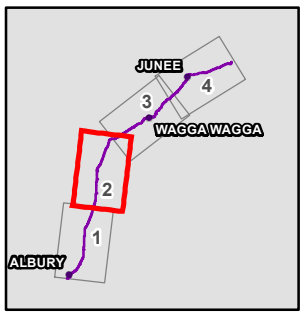
0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:3,000
Data Sources: GA Geodata, EPI, DLPI DTDB, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major Watercourse
- Minor Watercourse
- Flood Prone Land
- Riparian Lands and Watercourses
- Wetland



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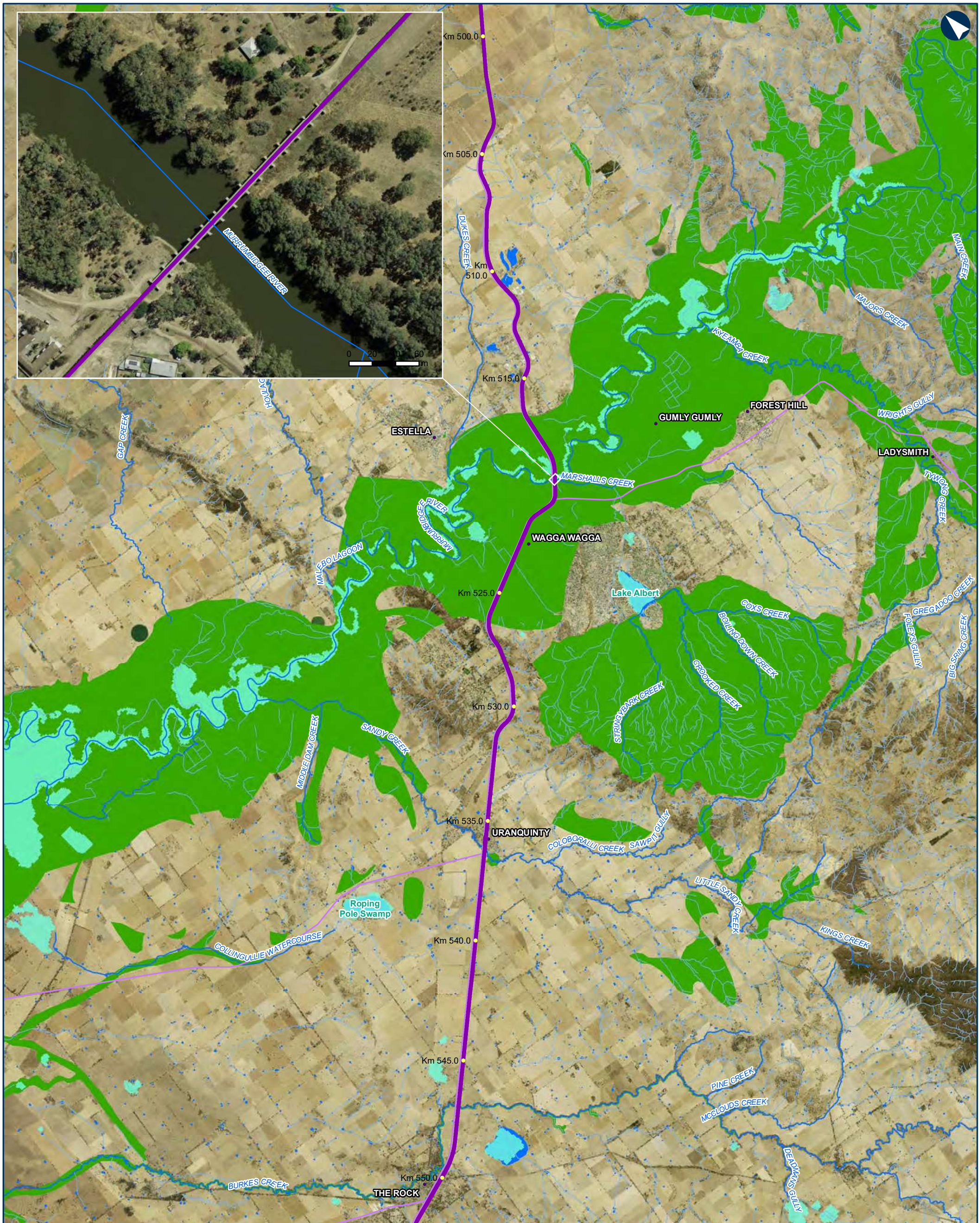

Albury to Illabo Figure 6.4 Watercourses and Flood Prone Land MAP 3 of 4

0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:145,360
Data Sources: GA Geodata, EPI, DLPI DTDB, ESRI

LEGEND
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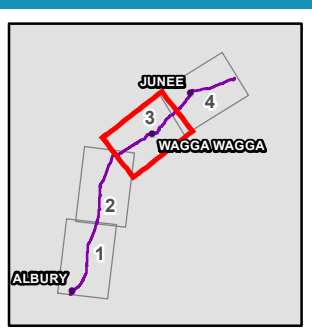
- A2I Proposal
- Railway
- Major Watercourse
- Minor Watercourse
- Flood Prone Land
- Riparian Lands and Watercourses
- Wetland



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Lake Bethungra
ILLABO
Km 455.0
IRONBONG CREEK
REDBANK FALL CREEK
PINCHGUT CREEK
ULANDRA CREEK
TURVEYS FALL CREEK
Km 465.0
MERRYBUNDINAH CREEK
JERALGAMBETH CREEK
Km 470.0
YELLOW CREEK
MITTA MITTA CREEK
WATTLE FALL CREEK
HARTS CREEK
Km 475.0
DRY CREEK
COOMA CREEK
BILLABONG CREEK
HORSE CREEK
EURONGILLY CREEK
Km 480.0
WANTIOOL CREEK
Km 485.0
JUNEE
ROCK CREEK
BUTLERS GULLY
BURNT CREEK
CIARIS CREEK
Km 490.0
SANDY CREEK
CAMP CREEK
CAMP GULLY
Km 495.0
BUCKS CREEK
HOULAGHANS CREEK
REEDY CREEK
Km 500.0
Km 505.0

Albury to Illabo

Figure 6.4 - Watercourses and Flood Prone Land

MAP 4 of 4

0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

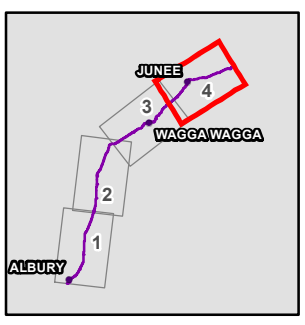
Date: 6/02/2020
Author: ERM

Paper: A3
Scale: 1:147,180

Data Sources: GA Geodata, EPI, DLPI DTDB, NSW Imagery

LEGEND

- ARTC KM Posts
- A2I Propsal
- Railway
- Major Watercourse
- Minor Watercourse
- Flood Prone Land
- Riparian Lands and Watercourses
- Wetland



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6.5.2 Scope of further assessment

6.5.2.1 Surface water

Proposed works are likely to have a minimal impact on hydrology surrounding the Enhancement Sites, as generally alteration to the height and location of the rail formation is minimal.

Nonetheless, a water quality assessment would be conducted for the EIS which would identify potential impacts and control measures for the management of water quality during construction and operation. It will include:

- Reviewing historical surface water quality data, with consideration of any supplementary data collected specifically for the Proposal;
- Assessing the potential impacts to surface water hydrology, including impacts at any watercourse crossings (both permanent and any temporary crossings required during construction);
- Consider relevant guidelines, including Using the ANZECC 2000 Guidelines and the Water Quality Objectives in NSW (DEC, 2006a); and
- Recommendations and mitigation measures.

6.5.2.2 Groundwater

Potential impacts of the Proposal would be described with reference to ground excavation works and proximity to water sources. A groundwater assessment would be undertaken to identify the existing groundwater conditions to minimise groundwater contamination during the construction phase. This would involve a desktop review of current hydrogeological conditions to determine the potential construction and operational risks to groundwater. It would include a review of existing data, reports and publicly available information including consideration of the Water Sharing Plans for the Murray and Murrumbidgee river catchments and the NSW Aquifer Interference Policy (NSW Office of Water, 2012).

A qualitative groundwater impact assessment would be completed using the information collated from the data review. This would include assessing the potential impacts of the Proposal on groundwater levels, GDEs, quality and quantity during construction and operation.

6.5.2.3 Flooding

Given the proposed works involve minimal alteration to the existing rail formation flooding impacts are unlikely. A flooding assessment would be undertaken for the EIS and would include a desktop assessment of the potential flood impacts of the Proposal. The assessment would consider the impacts of any structures such as bridges, culverts and embankments that intersect with mapped flood prone land.

6.6 Topography, geology and soils

6.6.1 Existing Environment

6.6.1.1 Topography

A desktop assessment of topographic mapping revealed that the northern section of the Proposal, from Illabo primarily passes through level farming land towards undulating terrain around Wagga Wagga.

The central part of the Proposal between Henty and Wagga Wagga generally passes through gently sloping to level farming land, however the Proposal traverses a valley at The Rock, between two uplifted hills (The Rock Hill and Flowerpot Hill), before returning through undulating terrain around Wagga Wagga.

The southern part of the Proposal from Albury to Henty generally passes through flat plains at Albury towards gentle sloping and level farming land moving north towards Henty.

Figure 6.5 demonstrates the general topography of the Proposal site.

6.6.1.2 Geology

The geology of the Proposal varies along the A2I alignment. A desktop assessment has provided an insight to the geology formation of the Proposal, as outlined in Table 6.4.

Table 6.4 Geology

GEOLOGY TYPE	CHARACTERISTICS	ESTIMATED COVERAGE
Cainozoic Shepparton Formation	Poorly consolidated clay, silt, sand and gravel of the Shepparton Formation.	35%
Quaternary alluvial deposits	Current and recent mud, silt, sand and gravel deposited by river (alluvial) systems.	25%
Ordovician sedimentary rocks	Dominantly interbedded quartz-rich sandstone, siltstone and mudstone. They were deposited in turbidity currents along the continental slope and deeper ocean water. Deep water chert is also a common feature, suggesting quiet, deep water conditions during deposition.	10%
Silurian I-S trans-type granites	Granite. Includes S-type granite with quartz feldspar muscovite biotite and cordierite. Some granite may be porphyritic - where larger crystals (typically feldspar) are surrounded by smaller ones.	10%
Cainozoic sedimentary	Unconsolidated mud, silt, sand and gravel of an uncertain age and origin.	5%
Devonian sedimentary rocks	Variable sedimentary rocks including conglomerate, sandstone, siltstone and mudstone. Some intercalated volcaniclastic rocks (clastic rocks derived from a volcanic source).	5%
Quaternary colluvial deposits	Colluvial deposits are unconsolidated sediments that are found downslope from hills. They form by erosion of hills and by creep or sheetwash.	5%
Silurian-Devonian sedimentary & volcanic rocks	Mixed volcanic and sedimentary rocks. Includes rhyolitic lavas with banding formed as the lava flowed, quartz and feldspar crystals and spherulites. Also includes associated volcanic-derived sedimentary rocks.	5%

6.6.1.3 Soils

A desktop assessment has been completed to provide an insight to the relevant geology and soil profiles within the A2I alignment. Table 6.5 provides an overview of the relevant Australian Soil Class (ASC) mapped within the proposed A2I alignment, with an estimated coverage included. Where the estimated coverage was considered to be less than 5 per cent, these ASC's were omitted given their comparatively minor extent, therefore the total estimated coverage in Table 6.5 below does not equal 100 per cent.

Table 6.5 Australian Soil Class along the A2I Alignment

AUSTRALIAN SOIL CLASS	CHARACTERISTICS	ESTIMATED COVERAGE
Sodosols	Sodosols show strong texture contrast with highly sodic B horizon but they are not highly acidic (pH > 5.5). Parent materials of Sodosols range from highly siliceous, siliceous to intermediate in composition. Sodosols are only found in poorly drained sites with rainfall between 50 mm and 1100 mm. Generally, sodosols have very low agricultural potential with high sodicity leading to high erodibility, poor structure and low permeability. These soils have low to moderate chemical fertility and can be associated with soil salinity.	30%

AUSTRALIAN SOIL CLASS	CHARACTERISTICS	ESTIMATED COVERAGE
Kurosols	Kurasols have a strong texture contrast (also known as a duplex soil) with a strongly acid B horizon that may or may not be sodic. Kurosols form from parent materials that are highly siliceous, siliceous to intermediate in composition and where rainfall is from 50 mm to 1350 mm in poorly drained sites or 750 mm to 1300 mm on well-drained sites. The surface of Kurosol soils are often acidic. They generally have very low agricultural potential with high acidity (pH < 5.5) and low chemical fertility. Kurosols commonly have low water-holding capacity and are often sodic.	25%
Chromosols	Chromosols have a strong contrasting texture. They are not strongly acidic or sodic in the upper B horizon. The parent material of Chromosols ranges from highly siliceous, siliceous to intermediate in composition. These soils are found in imperfectly drained sites (yellow and grey chromosol) where rainfall is between 250 mm and 900 mm. They are also found in well-drained sites (brown and red chromosol) with rainfall between 350 mm and 1400 mm. These soils have moderate agricultural potential with moderate chemical fertility and water-holding capacity. They can be susceptible to soil acidification and soil structure decline.	15%
Dermosols	Dermosols do not have strong texture contrast. They have a well-structured B2 horizon containing low levels of free iron. The parent materials of dermosols range from siliceous, intermediate to mafic in composition. The soils are found in imperfectly drained sites (yellow and grey dermosols) with rainfall between 550 mm and 1350 mm and in well-drained sites with rainfall between 450 mm and 1200 mm. Dermosols generally have high agricultural potential with good structure and moderate to high chemical fertility and water-holding capacity with few problems.	10%
Data source: Gray, J.M. & Murphy, B.W. (2002), Predicting Soil Distribution, Joint Dept. of Land & Water Conservation (DLWC) & Aust. Society for Soil Science Technical Poster, DLWC, Sydney.		

6.6.2 Scope of further assessment

Targeted geotechnical investigations would be undertaken as required, as part of the detailed design development process.

Consideration of soils and geology, and contamination would form part of the EIS process, including:

- Assessing whether salinity is likely to be an issue, determining the presence, extent and severity of soil salinity within the Proposal footprint;
- Consideration of the Proposal's impacts on soil salinity and how it may affect groundwater;
- Assessment of impacts on soil and land resources;
- Consideration of the suitability of spoil material for reuse on the Proposal in accordance with the waste avoidance hierarchy; and
- Mitigation measures would include erosion and sediment control measures, as detailed in the *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

This would be undertaken with consideration of relevant legislations and guidelines.

CULCAIRN
Km 600.0
Km 605.0
WALLA WALLA
Km 610.0
Km 615.0
Km 620.0
Km 625.0
JINDERA
Km 630.0
Km 635.0
Km 640.0
Km 645.0
ALBURY
MURRAY RIVER
BELLBRIDGE

Albury to Illabo

Figure 6.5 - Topography

MAP 1 OF 4

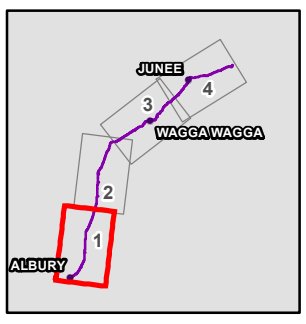
0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:144,550
Data Sources: GA Geodata, DLPI DTDB, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- Major Contours
- Minor Contours



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Km 545.0
Km 550.0
Km 555.0
THE ROCK
Km 560.5
Km 565.0
Km 570.0
Km 575.0
Km 580.0
HENTY
Km 585.0
Km 590.0
Km 595.0
CULCAIRN

Albury to Illabo

Figure 6.5 - Topography

MAP 2 OF 4

0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020
Author: ERM
Paper: A3
Scale: 1:144,550

Data Sources: GA Geodata, DLPI DTDB, ESRI

LEGEND

- ARTC KM Posts
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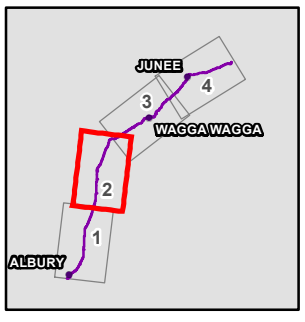
- Major River
- Major Contours
- Minor Contours



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Km 500.0
Km 505.0
Km 510.0
Km 515.0
ESTELLA
GUMLY GUMLY
FOREST HILL
LADYSMITH
WAGGA WAGGA
Km 525.0
Km 530.0
Km 535.0
URANQUINTY
Km 540.0
Km 545.0
Km 550.0
THE ROCK

Albury to Illabo

Figure 6.5 - Topography

MAP 3 OF 4

0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:145,310
Data Sources: GA Geodata, DLPI DTDB, ESRI

LEGEND

- ARTC KM Posts
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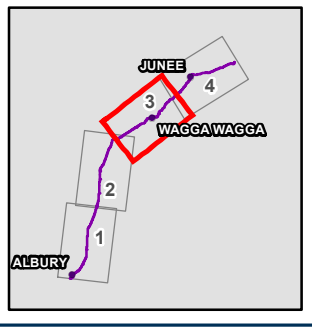
- Major Contours
- Minor Contours



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ILLABO
Km 455.0
Km 465.0
Km 470.0
Km 475.0
Km 480.0
Km 485.0
JUNEE
Km 490.0
Km 495.0
Km 500.0
Km 505.0

Albury to Illabo

Figure 6.5 - Topography

MAP 4 OF 4

0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:147,130
Data Sources: GA Geodata, DLPI DTDB, ESRI

LEGEND

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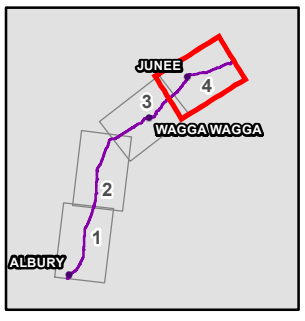
- A2I Proposal
- Railway
- Major River
- Major Contours
- Minor Contours



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6.7 Land use, socio-economic and visual issues

The Albury, Greater Hume, Lockhart, Wagga Wagga and Junee LEP maps and Australian Bureau of Statistics (ABS) data have been used in the desktop study to describe the socio-economic characteristics of the area and identify the different land uses across the Proposal site.

6.7.1 Existing environment

6.7.1.1 Land use

The Proposal is located within the existing railway corridor, which predominantly traverses agricultural industries, with significant cropping and livestock industries (zoned as RU1, shown in Figure 6.6). Sections of the Proposal are located within built-up urban areas, the most significant sections being those traversing Albury and Wagga Wagga. Other smaller urban areas include Gerogery, Culcairn, Henty, Yerong Creek, The Rock, Uranquinty, Bomen, Junee and Illabo.

6.7.1.2 Socio-economic

A review of 2016 census data (ABS, 2019) was undertaken to identify the community profile and economic context of the applicable LGAs which the Proposal traverses. This information is provided in Table 6.6 below.

Table 6.6 Statistical overview of Proposal LGA regions

CHARACTERISTIC	ALBURY	GREATER HUME	LOCKHART	WAGGA WAGGA	JUNEE	NSW
Overview						
Population	51,076	10,351	3,119	62,385	6,295	7,480,228
Male (%)	48.3	50.1	49.3	48.9	56.8	49.3
Female (%)	51.7	49.9	50.7	51.1	43.2	50.7
Median Age	39	44	46	35	40	38
Employment and Income						
Full-time employment	13,599 (55.3%)	2,729 (56.4%)	809 (60.1%)	19,163 (60.7%)	1,491 (61.3%)	2,134,521 (59.2%)
Part-time employment	8,084 (32.9%)	1,572 (32.5%)	406 (30.2%)	9,114 (28.9%)	687 (28.3%)	1,071,151 (29.7%)
Unemployed	1,684 (6.8%)	223 (4.6%)	54 (4.0%)	1,732 (5.5%)	116 (4.8%)	225,546 (6.3%)
Main Employment Industry	Hospitals (except Psychiatric Hospitals)	Beef Cattle Farming (Specialised)	Grain-Sheep or Grain-Beef Cattle Farming	Defence	Meat Processing	Hospitals (except Psychiatric Hospitals)
Main Occupation	Professionals	Managers	Managers	Professionals	Managers	Professionals
Median weekly household income	$1,185	$1,168	$1,114	$1,354	$1,139	$1,486
Family and Dwelling						
Families	12,829	2,723	802	15,773	1,362	1,940,226
Average people per household	2.3	2.5	2.5	2.5	2.5	2.6
Average Child per family	0.7	0.8	0.7	0.8	0.8	0.8

CHARACTERISTIC	ALBURY	GREATER HUME	LOCKHART	WAGGA WAGGA	JUNEE	NSW
Median monthly mortgage repayments	$1,421	$1,213	$1,000	$1,517	$1,200	$1,986
Median weekly rent	$231	$180	$150	$265	$200	$380
Data Source ABS, 2017						

In addition to the LGA overview provided above, a review of the primary industries of these LGAs provides an insight to the significant role of the agricultural industry of the region, as shown in Table 6.7.

Table 6.7 Industry of Employment across Proposal LGA's

LGA	INDUSTRY OF EMPLOYMENT	INDIVIDUALS	PER CENT	NSW COMPARISON
Albury	Hospitals (except Psychiatric Hospitals)	1,036	4.5 %	119,350 (3.5%)
	Supermarket and Grocery Stores	586	2.6 %	74,487 (2.2%)
	Cafes and Restaurants	527	2.3 %	80,552 (2.4%)
	Takeaway Food Services	527	2.3 %	56,957 (1.7%)
	Primary Education	527	2.3 %	65,204 (1.9%)
Greater Hume Shire	Beef Cattle Farming (Specialised)	239	5.3 %	13,478 (0.4%)
	Sheep Farming (Specialised)	128	3.5 %	6,728 (0.2%)
	Hospitals (except Psychiatric Hospitals)	155	3.4 %	119,350 (3.5%)
	Grain-Sheep or Grain-Beef Cattle Farming	154	3.4 %	4,557 (0.1%)
	Other Grain Growing	125	2.8 %	5,109 (0.2%)
Lockhart	Grain-Sheep or Grain-Beef Cattle Farming	131	11.1 %	4,557 (0.1%)
	Other Grain Growing	102	8.6 %	5,109 (0.2%)
	Sheep Farming (Specialised)	65	5.5 %	6,728 (0.2%)
	Hospitals (except Psychiatric Hospitals)	53	4.5 %	119,350 (3.5%)
	Aged Care Residential Services	52	4.4 %	67,209 (2.0%)
Wagga Wagga	Defence	1,368	4.6 %	21,848 (0.6%)
	Hospitals (except Psychiatric Hospitals)	1,353	4.5 %	119,350 (3.5%)
	Higher Education	910	3.1 %	46,246 (1.4%)
	Other Social Assistance Services	729	2.4 %	54,259 (1.6%)
	Secondary Education	706	2.4 %	58,072 (1.7%)
Junee	Meat Processing	186	8.3 %	7,100 (0.2%)
	Correctional and Detention Services	126	5.6 %	7,878 (0.2%)
	Grain-Sheep or Grain-Beef Cattle Farming	95	4.2 %	4,557 (0.1%)
	Sheep Farming (Specialised)	88	3.9 %	6,728 (0.2%)
	Hospitals (except Psychiatric Hospitals)	68	3.0 %	119,350 (3.5%)
Data Source: ABS, 2019				

CULCAIRN
Km 600.0
Km 605.0
WALLA WALLA
Km 610.0
E1
SP2
RU1
Km 615.0
Km 620.0
Km 625.0
JINDERA
RU5
Km 630.0
RU4
R5
W2
SP3
Km 635.0
B7
R2
E3
B1
E2
R1
Km 640.0
B2
B3
RE2
SP1
IN2
W1
B5
IN1
ALBURY
B6
RU2
MURRAY RIVER
RE1
B4
R3
E4
BELLBRIDGE

Albury to Illabo

Figure 6.6 - Land Use Zoning

MAP 1 OF 4

0 1 2 3 km

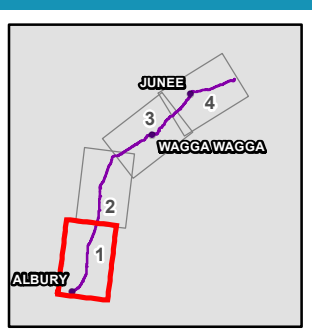
Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020
Author: ERM
Paper: A3
Scale: 1:144,600

Data Sources: GA Geodata; OEH, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- B1 Neighbourhood Centre
- B2 Local Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B6 Enterprise Corridor
- B7 Business Park
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- E3 Environmental Management
- E4 Environmental Living
- IN1 General Industrial
- IN2 Light Industrial
- R1 General Residential
- R2 Low Density Residential
- R3 Medium Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU4 Primary Production Small Lots
- RU5 Village
- SP1 Special
- SP2 Infrastructure
- SP3 Tourist
- W1 Natural Waterways
- W2 Recreational Waterways



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W1
Km 545.0
SP2
Km 555.0
IN1
R5
THE ROCK
RE2
Km 550.0
RU3
Km 560.5
RE1
Km 565.0
RU1
Km 570.0
Km 575.0
Km 580.0
HENTY
RU5
E1
Km 585.0
Km 590.0
Km 595.0
RU4
CULCAIRN

Albury to Illabo

Figure 6.6 - Land Use Zoning

MAP 2 OF 4

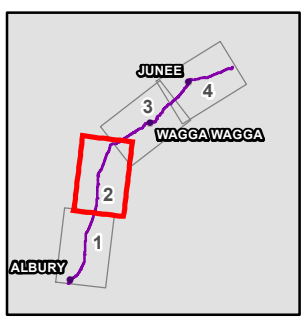
0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020
Author: ERM
Paper: A3
Scale: 1:144,600
Data Sources: GA Geodata; OEH, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- E1 National Parks and Nature Reserves
- IN1 General Industrial
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU3 Forestry
- RU4 Primary Production Small Lots
- RU5 Village
- SP2 Infrastructure
- W1 Natural Waterways



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Km 500.0
Km 505.0
Km 510.0
Km 515.0
Km 525.0
Km 530.0
Km 535.0
Km 540.0
Km 545.0
IN1
IN2
E4
ESTELLA
FOREST HILL
GUMLY GUMLY
LADYSMITH
B6
R3
B3
B4
RE2
R1
WAGGA WAGGA
B5
B1
RU1
W1
RE1
B2
W2
R5
RU4
RU6
E2
SP1
RU2
RU3
URANQUINTY
E1
THE ROCK
RU5
SP2

Albury to Illabo

Figure 6.6 - Land Use Zoning

MAP 3 OF 4

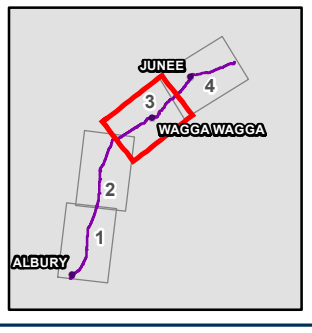
0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:145,360
Data Sources: GA Geodata; OEH, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- B1 Neighbourhood Centre
- B2 Local Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B6 Enterprise Corridor
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- E4 Environmental Living
- IN1 General Industrial
- IN2 Light Industrial
- R1 General Residential
- R3 Medium Density Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- RU3 Forestry
- RU4 Primary Production Small Lots
- RU5 Village
- RU6 Transition
- SP1 Special Activities
- SP2 Infrastructure
- W1 Natural Waterways
- W2 Recreational Waterways



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E3
ILLABO
Km 455.0
E1
Km 465.0
RU1
Km 470.0
Km 475.0
SP2
Km 480.0
R5
RE2
IN2
Km 485.0
JUNEE
RU5
Km 490.0
RE1
Km 495.0
RU4
Km 500.0
W1
Km 505.0

Albury to Illabo

Figure 6.6 - Land Use Zoning

MAP 4 OF 4

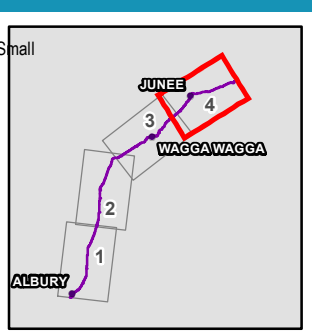
0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:147,180
Data Sources: GA Geodata; OEH, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- E1 National Parks and Nature Reserves
- E3 Environmental Management
- IN2 Light Industrial
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- RU4 Primary Production Small Lots
- RU5 Village
- SP2 Infrastructure
- W1 Natural Waterways



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6.7.1.3 Visual

The Proposal traverses a predominately rural area, with rural properties surrounding the vast majority of the Proposal alignment. The land surrounding the Proposal alignment is used for livestock or other agricultural purposes. The Proposal is also located in the vicinity of a number of towns and villages, including Albury and Wagga Wagga. Towns located in the vicinity of the alignment are described in Section 3.1.

Sensitive receivers are concentrated in the towns and villages along the Proposal site. Other sensitive receivers include scattered dwellings on rural landholdings. The majority of receivers outside the towns are located more than 100 m from the Proposal site.

6.7.2 Scope of further assessment

6.7.2.1 Land Use

A land use conflict risk assessment (LUCRA) would be prepared to assess the specific land uses, properties and owners that would be affected by the Proposal. This assessment will also identify the potential impacts of the Proposal on existing and future land uses.

The assessment would be undertaken with consideration of relevant legislation and guidelines, including:

- Infrastructure Projects on rural lands guide (DPI, 2013b);
- Landuse Conflict Risk Assessment Guide (DPI, 2011); and
- Local Environmental Planning instruments; Albury Local Environmental Plan 2010, Greater Hume Environmental Plan 2012, Lockhart Environmental Plan 2012, Wagga Wagga Environmental Plan 2010 and Junee Environmental Plan 2012.

6.7.2.2 Socio-economic

A socio-economic assessment will be undertaken to assess the social and economic impacts on the community as a result of the construction and operation of the Proposal. This assessment would include details of the local community, their nature and values, details of potential noise, vibration and visual impacts, likely traffic and access impacts to the community.

The assessment will also identify the nature of the community affected, the likely degree of impact and the necessary mitigation to minimise the impacts.

6.7.2.3 Visual

A landscape and visual assessment will be undertaken to identify the potential visual impacts on sensitive receivers from the construction and operation of the Proposal. This assessment would include details of the potential impacts on sensitive receivers, viewpoints and amenity impacts during construction.

The existing landscape character and its sensitivity to change will also be described and will identify the impact resulting from the construction and operation of the Proposal.

6.8 Noise and vibration

6.8.1 Existing Environment

The existing environment would experience low background noise levels consistent with the rural character of the area. Existing noise-generating activities would include agricultural activities, road traffic and rail operations nearing the towns of Illabo, Junee, Wagga Wagga, and Albury, which is where the majority of sensitive receivers are located.

Sensitive receivers are concentrated in the towns and villages along the Proposal site. Other sensitive receivers include scattered dwellings on rural landholdings. The majority of receivers outside the towns are located more than 100 m from the Proposal site.

6.8.2 Potential impacts

There would be noise and vibration generated by the construction and operation of the Proposal which would alter the existing noise environment.

6.8.2.1 Construction

Potential noise and vibration sources during construction would include:

- Operation of construction plant and equipment; and
- Noise associated with construction traffic and vehicle movements.

The degree of impact from construction noise would depend on the relative exposure of sensitive receivers and the type and duration of construction activities in the area. However, as the Proposal is linear, impacts on individual sensitive receivers during the construction phase would be for limited periods.

Vibration generated by construction activities typically dissipates to negligible levels within 50 to 200 m, depending on the type of activity and local geology. Therefore, widespread impacts from construction vibration are not anticipated.

6.8.2.2 Operation

The operation of a railway would result in the generation of noise including:

- Wheel rail interactions;
- Brake squeal from freight wagons at low speed;
- Horn noise;
- Maintenance activities (e.g. rail grinding, inspections);
- Ground vibration from train movements; and
- Idling diesel engine, exhaust system, cooling system and motor system noises.

The above noise sources would represent a long-term impact on the local environment. Many of these noise sources are currently experienced given the existing operation of the railway. The noise impacts associated with the Proposal will be assessed in this context, with consideration focused on the change in operational impacts of the trains.

6.8.3 Scope of further assessment

Noise impacts for the Proposal will be associated with construction noise in discrete locations proposed for enhancement sites, in addition to increased operational noise during freight use. A Noise Impact Assessment will be undertaken as part of the EIS and will take into consideration the *NSW Interim Construction Noise Guideline 2009* and NSW Environment Protection Authority – *NSW Rail Infrastructure Noise Guideline 2013*. The Noise Impact Assessment would include:

- Identification of sensitive receivers within the Proposal site;
- Assessment of construction noise levels on sensitive receivers and development of mitigation measures to manage impacts;
- Assessment of operational noise levels on sensitive receivers and identification of management measures, including any feasible and reasonable measures to mitigate impacts;
- Assessment of construction and operational noise and vibration in accordance with relevant NSW noise and vibration guidelines, with consideration of impacts to the structural integrity and heritage significance of items (including Aboriginal places and items of non-aboriginal heritage);
- Documenting of design, assessment and modelling assumptions and approaches;
- Carrying out noise monitoring at appropriate locations;
- Demonstration that blast impacts (if required) would be capable of complying with the current guidelines; and
- Identification of opportunities to reduce noise impacts through design or management measures.

Mitigation measures would be adopted during construction and operation to reduce the risk of adverse noise impacts, in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework (2017). These would be detailed in the EIS.

6.9 Traffic and transport

6.9.1 Existing Environment

The road network within the Proposal site consists mainly of local roads and private rural roads which vary between 50 and 80 km/h. The highways within the Proposal area include the Hume Highway, Olympic Highway, Sturt Highway and Riverina Highway. All these highways have posted speed limits of 100 km/h, except for Hume Highway which has a posted speed limit of 110 km/h. The major highways and road network in proximity to the Proposal is shown in .

The proposed alignment runs parallel to the Hume Highway between Albury and the intersection with Olympic Highway located north of Table Top, at which point the proposed alignment follows Olympic Highway. The alignment follows the Olympic Highway until Wagga Wagga, where the alignment runs parallel to Byrnes Rd until Junee, where the Proposal then re-joins the highway and the alignment again runs parallel to through to Illabo.

The existing alignment intersects the road network 55 times (subject to ongoing design refinements), including rail bridges, underpasses and level crossings intersecting with various highways, public roads and private roads. However, 15 of these intersections would require various works in order to enable the operation and use of double stacked trains. This information is outlined in Table 6.8 and Figure 6.7.

Table 6.8 Overview of Road network intersects

COUNT	INTERSECTION LOCATION	TYPE OF INTERSECTION	PROPOSED WORK
1.	Riverina Hwy, Albury	Rail underpass	Enhancement Site
2.	Wagga Rd, Table Top	Rail underpass	Enhancement Site
3.	Coach Rd, Gerogery	Level crossing	Track slew and utilities
4.	Sladen St, Henty	Level crossing	Track slew
5.	Cole St (also known as Plunkett St), Yerong Creek	Level crossing	Track slew
6.	Yarragundry St, Uranquinty	Level Crossing	Track slew
7.	Pearson St, Turvey Park	Rail underpass	Enhancement Site

COUNT	INTERSECTION LOCATION	TYPE OF INTERSECTION	PROPOSED WORK
8.	Edmondson St, Turvey Park	Rail underpass	Track slew and Enhancement Site
9.	Kemp St, Junee	Rail underpass	Track slew and Enhancement Site
10.	Olympic Hwy, Junee	Rail bridge	Track slew and Enhancement Site
11.	Waterworks Rd, Wantiool	Level crossing	Track slew
12.	Wornes Gate Ln, Illabo	Level crossing	Track slew
13.	Unnamed Rd, Illabo (-34.832161, 147.701300)	Level crossing	Track slew
14.	Brabins Rd, Illabo	Level crossing	Track slew
15.	Olympic Hwy, Illabo	Level crossing	Track slew

The Proposal follows the existing Main South line that runs between Albury and Sydney via Goulburn and Mittagong and currently services both passenger and freight trains. As noted in Section 3.4, active stations located along the track within the A2I Proposal site include the Culcairn, Henty, The Rock, Uranquinty, Wagga Wagga, Junee and Junee North Stations. Other facilities available on the line are outlined in Table 3.1.

6.9.2 Scope of further assessment

A detailed traffic and access impact assessment would be prepared as part of the EIS and would include:

- Identification of vehicle movements and access and haulage routes during construction, including the number, frequency and size of construction related vehicles at each enhancement site;
- Identification and assessment of impacts to major roads, including the need to close, divert or reconfigure elements of the road network associated with construction;
- Identification of traffic and access impacts to the local road networks and private properties;
- Mitigation measures to manage potential adverse impacts from the construction phase;
- The types and number of train movements on existing lines and the potential impacts to these train paths due to track possession requirements;
- Assessment and modelling of operational transport impacts of the Proposal for both road and rail including:
  - Existing and forecast demand and traffic volumes;
  - Travel time analysis;
  - Performance of key interchanges and intersections through a level of service analysis;
  - Impacts to the operation of any road services (bus and public transport infrastructure);
  - Wider traffic interactions; and
  - Identification of measures to mitigate potential impacts.
- Assessment of directly impacted level crossings with consideration to safety assessments and the operation of level crossings with regard to interaction of location traffic and train operations.

CULCAIRN
Km 600.0
Km 605.0
WALLA WALLA
Km 610.0
Km 615.0
Km 620.0
Km 625.0
HUME HIGHWAY
OLYMPIC HIGHWAY
JINDERA
DIGHTS FOREST ROAD
GEROGERY ROAD
Km 630.0
BURMA ROAD
Km 635.0
URANA ROAD
WAGGA ROAD
TABLETOP ROAD
RIVERINA HIGHWAY
Km 640.0
THURGOONA DRIVE
MATE STREET
HUME HIGHWAY
ALBURY
BORELLA ROAD
RIVERINA HIGHWAY
MURRAY RIVER
PADMAN DRIVE
WODONGA PLACE
YOUNG STREET
BELLBRIDGE
TROUT FARM ROAD

Albury to Illabo

Figure 6.7 - Road and Rail Network Overview

MAP 1 OF 4

0 1 2 3 km

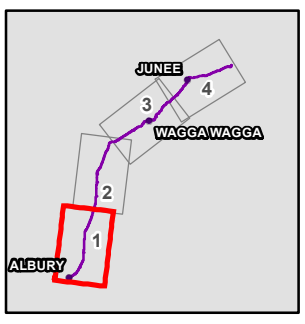
Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:144,600
Data Sources: GA Geodata; DLPI DTDB, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- Highway/Motorway
- Major Road
- Minor Road

BestImageryDates



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Albury to Illabo

Figure 6.7 - Road and Rail Network Overview

MAP 2 OF 4

0 1 2 3 km

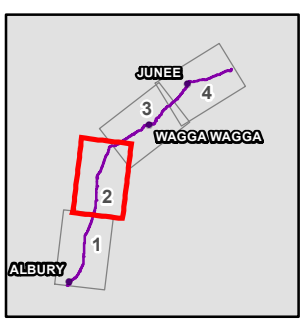
Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:144,600
Data Sources: GA Geodata; DLPI DTDB, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- Highway/Motorway
- Major Road
- Minor Road

BestImageryDates



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STRATHMORE LANE
YATHELLA ROAD
COURSING PARK ROAD
MARRAR ROAD
OLYMPIC HIGHWAY
HAREFIELD ROAD
Km 500.0
Km 505.0
Km 510.0
Km 515.0
FOREST HILL
GUMLY GUMLY
ESTELLA
LADYSMITH
HAMMOND AVENUE
EDWARD STREET
WAGGA WAGGA
Km 525.0
Km 530.0
STURT HIGHWAY
Km 535.0
URANQUINTY
Km 540.0
THE ROCK COLLINGULLIE ROAD
Km 545.0
THE ROCK MANGOPLAH ROAD
Km 550.0
THE ROCK
BULLENBONG ROAD

Albury to Illabo

Figure 6.7 - Road and Rail Network Overview

MAP 3 OF 4

0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
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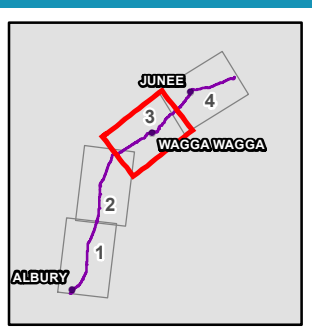
LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- Highway/Motorway
- Major Road
- Minor Road

BestImageryDates



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Albury to Illabo | Figure 6.7 - Road and Rail Network Overview | MAP 4 OF 4

0 1 2 3 km

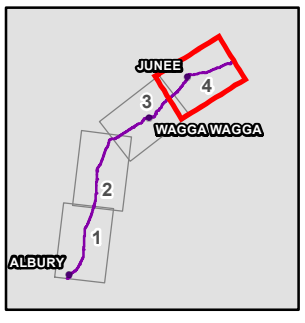
Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:147,180
Data Sources: GA Geodata; DLPI DTDB, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- Highway/Motorway
- Major Road
- Minor Road

BestImageryDates



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6.10 Air quality

6.10.1 Existing environment

Ambient air quality in the vicinity of the Proposal would be characteristic of rural areas, which have low particulate matter and pollutants in the air. The main factors affecting the air quality in the Proposal site would include road traffic, agricultural activities and prevailing meteorological conditions. Air pollution would be higher in the larger towns, particularly Albury and Wagga Wagga, where there is increased activities including commercial and industrial operations.

Sensitive receivers are concentrated in the towns and villages along the Proposal site. Other sensitive receivers include scattered dwellings on rural landholdings. The majority of receivers outside the towns are located more than 100 m from the Proposal site.

The potential sources of emissions to air, which may affect air quality during construction, are:

- Gaseous emissions from mobile and stationary construction plant and equipment and construction vehicles;
- Vehicle and mobile plant movement on paved and unpaved road and haulage routes;
- Wind erosion of exposed areas (e.g. haul roads and unstabilised stockpiles);
- Handling and transfer of materials, including the loading and unloading of spoil and other materials; and
- Bulk earthwork operations, such as excavation, clearing of groundcover and topsoil, blasting, spreading of topsoil.

Operational impacts would be the operation of diesel trains along the Proposal site. The potential sources of emissions to air, which may affect air quality during operation, are:

- Gaseous emission (e.g. nitrogen dioxides, carbon monoxide and different fractions of particulates (dust) from diesel fuel consumed during operation of locomotives); and
- Other minor sources of dust emissions – for example, from brake pads, wheels and rails wear.

6.10.2 Scope of further assessment

A specialist air quality impact assessment would be undertaken as part of the EIS. The air quality impact assessment would include:

- Identification of sensitive receivers and places with potential for impact;
- Documenting key design, construction, operating and modelling assumptions;
- Identifying relevant meteorological conditions;
- Justifying the modelling approach; and
- Documenting the characteristics of emissions and their effect on local and regional air quality conditions.

The air quality impact assessment would be undertaken with consideration of relevant legislations and guidelines, including:

- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2016);
- Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC, 2005); and
- Technical Framework – Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006b).

6.11 Contamination

A desktop investigation of potential contamination sources was undertaken by conducting searches of contamination registers. This section included a review of the ARTC Contaminated Land Records, NSW EPA Contaminated Land: Record of Notices database and NSW EPA contaminated sites register for the Albury, Greater Hume, Lockhart, Wagga Wagga and Junee LGAs.

6.11.1 Existing environment

A search of the NSW EPA contaminated sites register for the Albury, Greater Hume, Lockhart, Wagga Wagga and Junee LGAs identified seven contaminated sites.

Table 6.9 Contaminated Land: Record of Notices

LOCAL GOVERNMENT AREA	RECORD OF NOTICES
Albury City Council	19 notices relating to 4 sites
Greater Hume Shire Council	No records
Lockhart Shire Council	No records
Wagga Wagga City Council	9 notices relating to 3 sites
Junee Shire Council	No records

A further search of the NSW EPA Notified Sites list was also undertaken. This identified 33 sites which are currently being reported to the EPA, and are under investigation to remediate the site. This information has been presented in Table 6.10. Further investigation is required to understand the proximity of these sites to any proposed ground disturbance, and to properly manage potentially contaminated soils.

Table 6.10 List of NSW Contaminated Sites Notified to EPA

SUBURB	NOTIFIED SITES
Albury	12
Lavington	3
Culcairn	1
Uranquinty	1
Wagga Wagga	15
Junee	1

The proximity of contaminated land sites are shown in Figure 6.8 below. Of these listed contaminated sites, it has been identified that there are three contaminated lands sites that intersect with the A2I alignment. These are shown in Figure 6.8 and include the following sites:

- Albury – Rail Corridor culvert contamination investigation;
- Albury – Railway Yards & Refuelling Facility; and
- The Rock – Rail Yard

CULCAIRN

Km 600.0

Km 605.0

Km 610.0

Km 615.0

Km 620.0

Km 625.0

Km 630.0

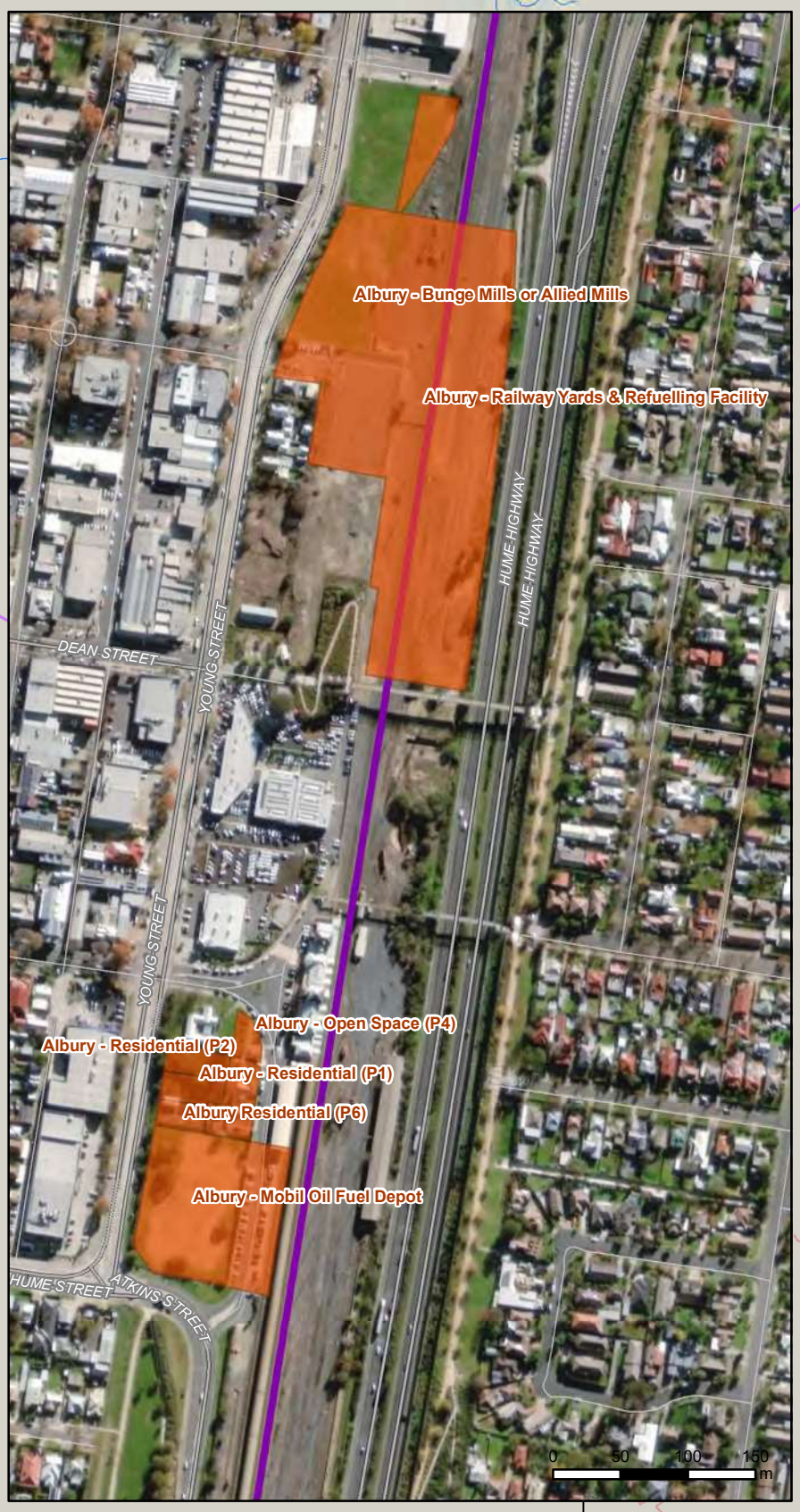
Km 635.0

Km 640.0

ALBURY

BELLBRIDGE

MURRAY RIVER



Albury to Illabo

Figure 6.8 - Contaminated Lands within 200m of the A2I Proposal site

MAP 1 OF 4

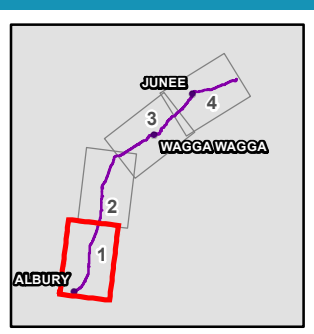
0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:144,600
Data Sources: GA Geodata; OEH, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- LGA Boundary
- Contaminated Land Sites



INLAND RAIL

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Km 545.0
Km 555.0
THE ROCK
Km 550.0
Km 560.5
Km 565.0
Km 570.0
Km 575.0
Km 580.0
HENTY
Km 585.0
Km 590.0
Km 595.0
CULCAIRN

Albury to Illabo

Figure 6.8 - Contaminated Lands within 200m of the A2I Proposal site

MAP 2 OF 4

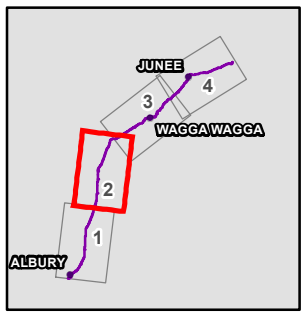
0 1 2 3
km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:144,620
Data Sources: GA Geodata; OEH, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- Main Road
- Local Road
- LGA Boundary
- Contaminated Land Sites



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Km 500.0
Km 505.0
Km 510.0
Km 515.0
Km 525.0
Km 530.0
Km 535.0
Km 540.0
Km 545.0
Km 550.0

ESTELLA
FOREST HILL
GUMLY GUMLY
LADYSMITH
WAGGA WAGGA
URANQUINTY
THE ROCK

EDWARD STREET
BAYLIS STREET
Wagga Wagga - Railway Precinct
0 50 100 150 m

0 50 100 150 m
Uranquinty - Leased Land
MORGAN STREET
RYAN STREET
OLYMPIC HIGHWAY

0 50 100 150 m
The Rock - Rail Yard
RAILWAY STREET

Albury to Illabo

Figure 6.8 - Contaminated Lands within 200m of the A2I Proposal site

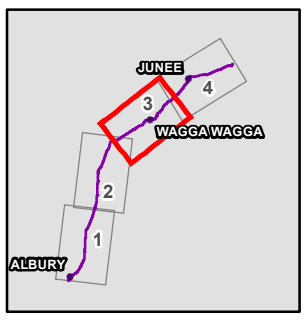
MAP 3 OF 4

0 1 2 3 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020 Paper: A3
Author: ERM Scale: 1:145,360
Data Sources: GA Geodata; OEH, ESRI

LEGEND
- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- Main Road
- Local Road
- LGA Boundary
- Contaminated Land Sites



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ILLABO

Km 455.0

Km 465.0

Km 470.0

Km 475.0

Km 480.0

Km 485.0

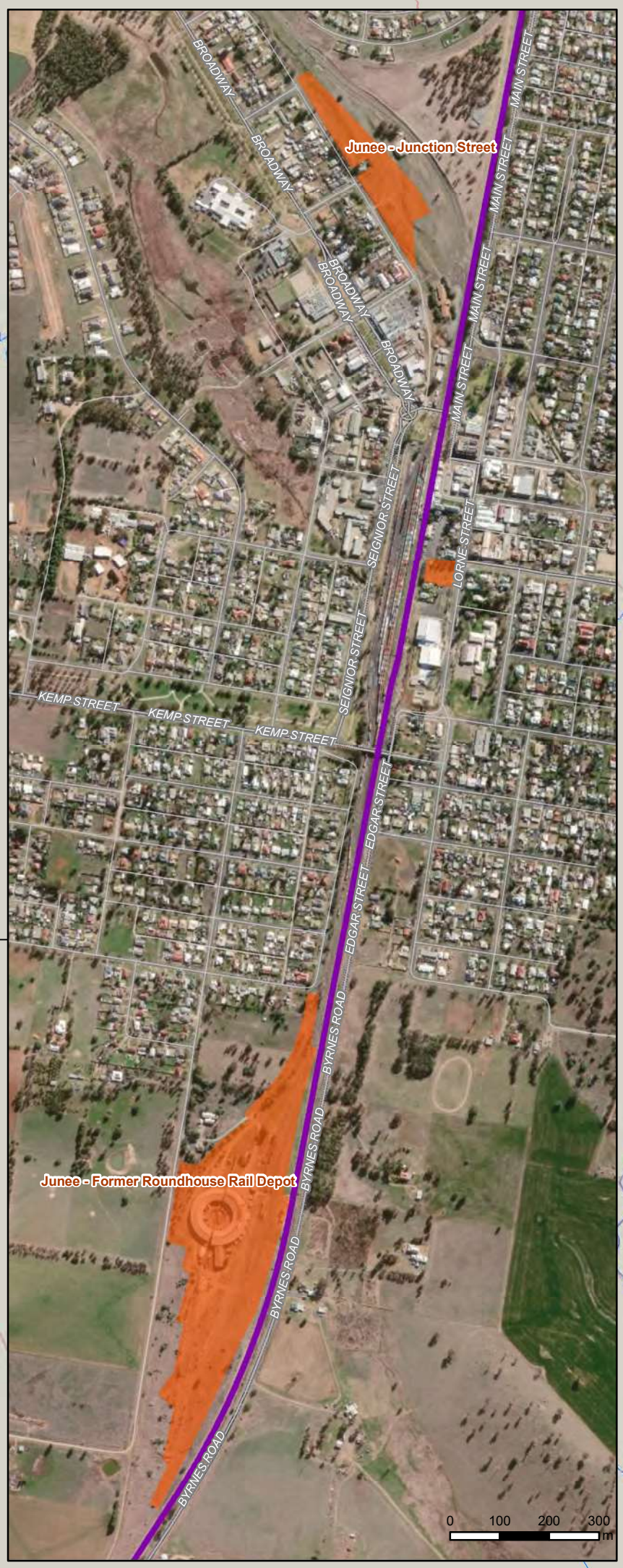
JUNEE

Km 490.0

Km 495.0

Km 500.0

Km 505.0



Albury to Illabo

Figure 6.8 - Contaminated Lands within 200m of the A2I Proposal site

MAP 4 OF 4

0 1 2 3
km

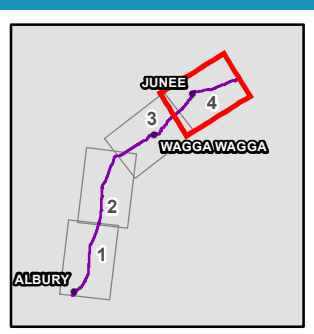
Coordinate System: GDA 1994 MGA Zone 55

Date: 6/02/2020
Author: ERM
Paper: A3
Scale: 1:147,180

Data Sources: GA Geodata; OEH, ESRI

LEGEND

- ARTC KM Posts
- A2I Proposal
- Railway
- Major River
- Main Road
- Local Road
- LGA Boundary
- Contaminated Land Sites



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6.11.2 Scope of further assessments

A Phase 1 Preliminary Environmental Site Assessment and would be prepared for the EIS. The Phase 1 would provide information on the history of site contamination, previous studies completed within the investigation area and a risk assessment to determine the likelihood for contamination. Samples of any materials considered as potential contamination will be taken during the geotechnical investigations.

In addition, Phase 2 Environmental Site Assessment investigations would be carried out during the preparation of the EIS to inform detailed design.

6.12 Waste and resource use

Waste produced during construction would include:

- Decommissioned railway components (rail, timber/concrete sleepers, transoms, etc.);
- Decommissioned ancillary components (footbridges, road base, etc.);
- Spoil from excavation;
- Spoil and groundwater (if groundwater is encountered) that is potentially contaminated;
- Surplus construction materials;
- General domestic waste;
- Waste from construction site compounds; and
- Wastewater from dewatering activities such as groundwater (if groundwater is encountered), stormwater and construction site run-off.

The waste produced and encountered on-site would be managed in accordance with the Waste Classification Guidelines (EPA, 2014a). Standard environmental management measures based on these guidelines would be prepared by the construction contractor prior to construction.

During operation and maintenance activities, only minimal waste would likely be generated.

Waste would be considered in the preparation of the EIS, assessing predicted waste generation during construction and operation including:

- Classification of wastes and an estimate of the quantity of each waste classification;
- Identification of waste handling procedures, including likely stockpile locations and volumes; and
- Management measures and waste minimisation and reuse opportunities.

An assessment of waste would include consideration of relevant legislations and guidelines, including:

- Waste Classification Guidelines – Part 1: Classification of Waste (EPA 2014a);
- NSW Waste Avoidance and Resource Recovery Strategy (EPA 2014b);
- NSW Sustainable Design Guidelines Version 3.0 (TfNSW, 2013b); and
- Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DECC, 2008).

6.13 Greenhouse gas and energy

During construction, the Proposal has the potential to generate gas greenhouse emissions by the burning of fossil fuels (use of equipment and machinery), the materials used and the clearance of vegetation.

During operation, greenhouse gas emissions would be generated by the operation of the rail line. Emissions would predominately be from the use of diesel. It is noted that operational greenhouse gas emissions would be associated with locomotives that utilise the Inland Rail are out of scope as these are not owned by the Proponent.

The operation of the line would assist in reducing the amount of freight moved by road and greenhouse gas emissions associated with freight vehicles.

A Scope 1 greenhouse gas assessment would be prepared, based on the Australian National Greenhouse Accounts Factors 2008, prepared by the Australian Government Department of Climate Change.

6.14 Climate change

Due to the anticipated timing of the Proposal, impacts due to climate change would not be expected to be significant during the construction phase of the Proposal. Operationally, potential issues from climate change would include damage and buckling in tracks due to more extreme temperature variations and more extreme weather events (e.g. flooding of the rail corridor). Climate change adaptations would be considered in the design process of the Proposal. A climate change risk assessment would be completed and would provide recommendations to minimise the impacts of climate changes. A bushfire risk assessment and management plan, will need to be undertaken, including consultation with NSW State Emergency Services, NSW Rural Fire Services and other relevant stakeholders, to manage bushfire risk within the Murray-Riverina region, adjacent the A2I alignment.

The following government guidelines would be considered as relevant during the preparation of the climate change risk assessment:

- Commonwealth Scientific and Industrial Research Organisation's and Bureau of Mereology's State of the Climate 2018 Intergovernmental Panel on Climate Change's Fourth Assessment Report, 2007;
- NSW Planning & Environment's Critical State Significant Infrastructure Standard Secretary's Environmental Assessment Requirements (SEARs) December 2015;
- ISO 31000-2018; Risk Management – Principles and Guidelines;
- AS 5334 – Climate Change Adaptation for Settlements and Infrastructure;
- Australian Government's Climate Change Impacts and Risk Management – A Guide for Business and Government (2006);
- AS/NZS 3100:2009 Risk Management – Principles and Guidelines;
- Technical Guide for Climate Change Adaptation for the State Road Network (Roads and Maritime Services, in draft); and
- ARTC Inland Rail Climate Change Risk Assessment Framework.

6.15 Hazards and risks

Hazards and risks associated with the construction of the Proposal would include:

- The use and storage of hazardous chemicals;
- The use of heavy machinery;
- Works conducted in an operational rail corridor;
- Works within, over or adjacent to an operating roadway; and
- Bushfire risk (both the risk of ignition and of fire spreading to and from the corridor).

Construction hazards and risks would be managed through the application of standard mitigation measures, which would be developed prior to construction.

Potential operational hazards and risks would include train accidents (including derailment, collision or impact), level crossing collisions, spills from train and equipment (such as oil and cleaning chemicals) and accidents involving hazardous cargo. These risks would be managed through design and the application of education programs, and standard mitigation measures and plans (such as emergency response plans).

Construction and operational hazards and risks would be further investigated during the preparation of the EIS.

6.16 Utilities and services

The Proposal would require any intersecting utilities to be relocated or protected. Based on preliminary desktop analysis, the following utilities may be impacted by the Proposal:

- Water and sewer assets maintained by Albury City, Greater Hume Shire Council, Lockhart Council, Wagga Wagga City Council and Junee Shire Council;
- Electricity assets maintained by Essential Energy;
- Gas assets maintained by AGN; and
- Telecommunications assets owned and maintained by Telstra, Optus, NBN, etc.

Due to double-stacked clearance requirements it can be assumed that typically all crossings would require the services to be modified. If there is insufficient clearance then raising or relocation of power lines or underground cabling might be required to provide clearance.

All construction activities would be carried out in consultation with relevant land owners and infrastructure and services providers to minimise impact.

A more detailed investigation of existing utilities and services would be undertaken during the design process. Impacts to utilities within the rail corridor would need to be determined during preparation of the EIS.

6.17 Cumulative impact

An assessment of the cumulative impacts would include a description of any major projects occurring in the vicinity of the Proposal and assess the potential cumulative impacts associated with any third-party development and the Proposal.

The cumulative impact assessment would also need to provide consideration for the other Inland Rail projects. In particular, the projects that adjoin to the A2I section, which includes the Illabo to Stockinbingal section and the Tottenham to Albury section.

6.18 Sustainability

A sustainability assessment would be undertaken as part of the EIS in accordance with the Infrastructure Sustainability Council of Australia (ISCA) *Infrastructure Sustainability Rating Tool* and recommend an appropriate target rating for the Proposal. In addition, the sustainability assessment would be prepared in accordance with the Inland Rail sustainability strategy and the NSW Sustainable Design Guidelines Version 3.0 (TfNSW, 2013b). The assessment would:

- Document how the Proposal would address and achieve the principles of ecologically sustainable development;
- Describe the sustainability benefits of the Proposal;
- Provide context for the need for sustainable outcomes on the Proposal; and
- Document opportunities to improve sustainable outcomes on the Proposal, including:
  - Opportunities to utilise reuse materials during maintenance activities;
  - Opportunities to design the easing of curves and gradients to maximise locomotive fuel efficiency during operation; and
  - Providing future proofing opportunities for regional communities to connect to Inland Rail.

7 Consultation

7.1 Overview and Summary

In 2010 the Australian Government completed the Melbourne–Brisbane Inland Rail Alignment Study (ARTC, 2010) to determine if an inland railway line is required. In late 2013, the then Deputy Prime Minister, the Hon Warren Truss MP, established an Inland Rail Implementation Group (IRIG) to develop a delivery programme for the implementation of Inland Rail. The IRIG was chaired by former Deputy Prime Minister, the Hon John Anderson AO, with senior representatives from the Australian, New South Wales, Queensland and Victorian governments, and ARTC.

To support the IRIG investigations, ARTC was tasked with developing the Inland Rail Programme Business Case (ARTC, 2015), including a ten year delivery schedule, cost estimate, development strategy and a detailed analysis of the economic benefits of Inland Rail. The Inland Rail Implementation Group took a consultative approach, engaging with a broad range of stakeholders including potential future users as well as individuals, communities and others who would live and work along the alignment to understand the breadth of issues associated with Inland Rail. The IRIG delivered the Inland Rail Programme Business Case (ARTC, 2015) to the Australian Government in September 2015. At this time, the Melbourne–Brisbane Inland Rail Alignment Study (ARTC, 2010) was endorsed by the IRIG.

Continued stakeholder and community consultation for Inland Rail is an integral part of informing scoping investigations for the proposal. The purpose of this Chapter is to provide an overview of the consultation and engagement undertaken from September 2018 to August 2019.

In total thirteen (13) formal and informal community information sessions and community information booths along with briefings to local Councils were undertaken with over 650 community members and stakeholders engaged.

The general sentiment across the consultations is that some of the communities are already experiencing operational impacts associated with the existing rail corridor operations such as noise and vibration. Communities have raised concerns as to what the construction impacts will be during the works and once completed how this will affect long term operational impacts, as well visual amenity matters in relation to their own properties.

It is clear that the community desire more details on final design, what the methodologies and impacts will be during the construction phase, a clear understanding of the visual amenity of new/replaced or altered structures and what operational impacts may result at completion of the works.

ARTC's values and objectives commit the organisation to active and genuine engagement with stakeholders and the community. For Inland Rail, effective communication and stakeholder engagement are fundamental to reducing risk, optimising route alignment, minimising social and environmental impacts, maximising community benefits, securing statutory approvals, and gaining and maintaining the social licence to operate. ARTC believes that identifying, engaging and effectively communicating with stakeholders is critical to the successful delivery of Inland Rail. ARTC will continue to engage with Representatives, Government agencies, local governments, industry, community and special interest groups at key project milestones and throughout the A2I proposal phases.

7.2 Strategic Approach and Objectives

The A2I proposal Team is committed to supporting the core values and code of ethics of the International Association for Public Participation - IAP2 and in particular the engagement spectrum that drives the selection and subsequent implementation of the communications and consultation tools that are used. To help inform the consultation approach, ARTC has developed a number of strategic consultation plans, including the Inland Rail Strategic Stakeholder and Engagement Plan. The approach is robust, diverse and flexible with a focus on inclusiveness.

ARTC recognises that public participation not only promotes sustainable decisions by recognising and communicating the needs and interests of all participants, including decision makers, it also provides the opportunity to embed valuable community feedback into the detailed design process and methodologies including timing and durations for the construction phase.

The objectives for the consultation and engagement process are as follows:

- Provide detailed information on the design, locations, proposed works and methodologies – that are easily understood and accessible to those that have an interest in and/or may have the potential to be impacted;
- Provide a diverse and robust consultation timetable to provide communities and stakeholders adequate and appropriate opportunity to be provide feedback;
- To build on existing relationships with communities and stakeholders, and to increase ARTC awareness of preferred means of communications, as the project moves into detailed design and subsequent construction phases;
- To provide a clear understanding of what the next steps are, and opportunities to provide further feedback;
- Continue to monitor and evaluate communication tools to assess level of effectiveness and adjust where necessary;
- To close out feedback loops to community members in timely manner;
- Identify opportunities in the next phases of consultation to '*involve'* and where possible *'collaborate'*; and
- Identify legacy opportunities with the community such as the existing *Culcairn footbridge.*

7.3 Consultation and Stakeholders

7.3.1 Engagement and Consultation Tools

Consultation and community engagement has occurred since the feasibility stage including general Inland Rail briefings provided to the community and Councils in the project area with community drop in session dating back to July 2016. Between March 2016 and November 2018 further targeted consultation focussed on the enhancement sites and communities in Junee, Wagga Wagga, Albury, Henty, Illabo and Culcairn.

The A2I project team focused on concept and reference design consultation with members of the community, adjacent residents and heavy/regular users of the enhancement sites such as nearby schools. This consultation included the use of communication tools such as; face to face (F2F) meetings with industry and councils, Information stands, door knock and letter drop to nearby residents, calls, emails, 1800 number and community information emails, media releases, community group presentations, briefings with local Councils and neighbourhood drop in sessions.

This approach was used to provide diverse and flexible opportunities for stakeholders and members of the community to seek an understanding of the proposed works, clarify questions and provide valuable feedback to incorporate into final design, construction planning and the development of mitigation management measures. In summary, the following community engagement activities were undertaken

- 11 Sep 2018 Community drop in sessions for neighbourhood around Kemp Street bridge, held at Endeavour Park, Junee, 40 people;
- 12 Sep 2018 Community drop in sessions for neighbourhood around Olympic Hwy underpass, held at Ben Martin Park, Junee, 23 people;
- 13 Sep 2018 Community information booth in front of Junee Newsagency, 33 people;
- 13 Sep 2018 Community drop in sessions for neighbourhood around Edmondson Street, held at Railway Street, Wagga Wagga, 35 people;

- Sep 18-20 2018 Community information booth at Henty Machinery Field Days;
- 24 Sep 2018 Community drop in sessions for Albury, held at QEII Square, Dean St, 45 people;
- 25 Sep 2018 Community information booth in Wagga Wagga Marketplace, 95 people;
- 11 Oct 2018 Community information booth at Illabo show at the showground 90 people;
- 27 Oct 2018 Community information booth at Junee Show at the showground, 300 Inland Rail bags given out, >200 people spoken too, >50 feedback forms received;
- 1 Dec 2018 Culcairn Community Information Session, 50 people;
- 2 - 3 Nov 2018 Community information booth at Albury show, 28 feedback forms received;
- 27 July 2019 Community information booth at Wodonga Farmers Market, 75 people;
- 7 Aug 2019 Presentation to Junee Business and Trades Association, 14 people; and
- 7 Aug 2019 Presentation to Hume Group Country Women's Association (CWA) in Junee, 36 people.

7.3.2 Stakeholder Analysis

The front line community consultation was followed by briefings with the Council executives and Councillors at Greater Hume Shire Council, Wagga Wagga City Council and Junee Shire Council, including community consultation with the Culcairn community in October 2019.

Five main stakeholders' groups were identified and categorised into:

- Government;
- Business and Industry;
- Community;
- Environment; and
- Media.

These five main groups can be further categorised into nineteen subgroups. This section provides a summary of the stakeholders, consultation tools implemented and feedback received to date for each of the four main community precincts for the proposed projects within each Precinct.

7.3.3 Summary of Consultation Outcomes

The communities expressed that they are already experiencing issues with noise and vibration from existing operations and there is concern it will be made worse with double-stacked container trains, and the potential for more trains per day. Whilst noise logging was conducted in November 2018 around the enhancement sites to assess the baseline level of noise associated with existing operations there is a commitment for further noise logging to be undertaken.

Community concerns raised during consultation were related to the construction activities including noise and vibration, operational impacts and visual amenity. Additional concerns raised across the A2I Proposal site included;

- safety, pedestrian and school children access
- closures,
- frequency of trains,
- removal of trees,
- drainage,
- loss of historically significant structures,

- car parking for residents,
- contractor behaviour,
- decrease in nearby home value,
- more information around options being considered and commencement / duration of construction,
- increased road height causing flooding and impact of higher retaining walls,
- visual amenity, and
- steepness of bridges to be raised.

It was also raised that the works may bring local business and contracting opportunities, and in some areas bring benefits such as improved access/egress for trucks and preservation and /or strengthening of existing structures of heritage or community value.

Key issues raised across each of the works areas are summarised below.

Murray River Bridge and Albury Station Precinct

Murray River Rail Bridge;

- Support from the community for the existing bridge to be retained; and
- Raised concerns about life of the bridge and if the structure is being reinforced.

Riverina Highway Bridge

- Concerns raised that the works will be noisy and increase traffic.

Culcairn Station Precinct

Culcairn Footbridge

- Mixed responses from consultation however preferred was lifting and retaining the bridge for community benefit as a viewing platform. However, it was recognised that this option had constraints such as structural integrity, contamination and cost.

Wagga Wagga Station Precinct

Mothers Footbridge

- High level of pedestrian access on the bridge especially patrons to the Museum, train staff and passengers to Wagga Wagga town centre. Concerns raised on the length of time construction impacts may prohibit access across the bridge.

Edmondson Street Bridge

- Residents are mostly concerned of potential impacts during construction including; noise and vibration, access to their properties and changes to traffic flow;
- One property on the corner of Erin Street and Edmondson Street likely to have a higher retaining wall at the front due to the increase height of the road. Concerns raised about visual amenity and removal of existing trees;
- Concerns raised regarding the pedestrian footbridge would be used late at night by pub-goers on their way home;
- Concerns that the intersection at the end of Little Best Street on to Edmondson Street is too dangerous and support making Little Best Street a no through road; and

- Safety concerns were raised, with a request for an improved drop off and pick up area for primary school students. Request also made that that while crossing the bridge that a barrier between the footpath and the road be installed.

Brookong Avenue Footbridge

- Most of the concerns raised were about existing operational noise and that this has the potential to worsen with longer and heavier trains on the line;
- Some concerns raised about construction noise when work on the new bridge starts as several houses and Kildare Catholic College back directly onto the bridge; and
- Some residents support the removal/relocation of Brookong Avenue Footbridge, largely due to privacy issues a bridge pedestrians can look into backyards.

Pearson Street Road Bridge

- Some concerns were raised about drainage in the area and previous flooding within the area.

Junee Station Precinct

Olympic Highway Rail Underpass

- Existing concern that the bridge is too low for trucks which causes them to cross into the middle of the road to pass underneath, previous history of accidents as a result; and
- There were concerns raised about the increased number of trains and subsequent noise and vibration for nearby residents as the current level of operational noise is an issue.

Junee Station Footbridge

- Most community members expressed that they were comfortable with the removal of the Junee Station footbridge as it is no longer in use.

Kemp Street Bridge

- Emergency Services are concerned that access across the rail line will be affected when Kemp Street is closed for construction;
- Pedestrian access across Kemp Street during bridge construction is a concern, as a lot of students and their families use it to get to school;
- The intersection at Kemp Street and Olympic Highway at Railway Lane is dangerous with many near misses reported by residents – some residents believe this intersection should be blocked off for safety, other residents disagree;
- The gradient of the bridge heading to Ducker Street is already very steep making the bridge higher will potentially exacerbate this issue;
- Some residents suggested that Kemp Street bridge is closed altogether and replaced with a footbridge;
- Queries raised whether the new bridge will be suitable for b-double trucks, as some trucks already use Kemp Street Bridge;
- Concerns regarding flooding being caused by raising the height of the road outside properties and shading issues with their homes as a result of the final bridge height; and
- Existing concerns with operational noise and vibration potential that would be made worse by longer and heavier trains.

7.4 Strategic Approach

In order to deliver best practise consultation and engagement to deliver the A2I project, ARTC is committed to community engagement practices that are open, transparent, ongoing and equitable.

ARTC aims to:

- Provide timely, coordinated and accurate project information;
- Be proactive in our engagement approach, including identifying key issues and stakeholders early in the project lifecycle;
- Communicate in a clear and consistent manner with a focus on openness, honesty and empathy;
- Manage and respond to community enquiries and complaints in a timely manner; and
- Contain and manage incidents effectively, according to the Complaints Process outlined in the A2I Engagement Plan.

ARTC will address concerns raised during the consultation period in line with the Engagement Implementation Plan Albury to Illabo (A2I) Plan and will:

- Respond to the community via a letter to relevant participants, media release or an advertisement in local papers that addresses what was discussed and next steps for the project;
- Develop site visualisations to demonstrate what the new bridges will look like and to assist with addressing visual amenity concerns;
- Develop a regular A2I project newsletter and include key information such as noise monitoring, which is to be distributed to local residents, businesses, trains stations, community hubs, website and social media;
- Send a thank you email and seek feedback from those consulted including; School Principals, residents, community groups and historical societies;
- Provide briefings to targeted stakeholders including local Councils, MPs, local bus companies and emergency services;
- Include a summary of issues and community feedback received during consultation;
- Establish a Community Consultative Committee (CCC) for the A2I project. The CCC will complement the ongoing consultation activities and is another avenue for consultation and information; and
- Further consultation and communications have been scheduled for late 2019 and early 2020 to further understand issues and to plan for construction, undertake visual amenity assessments, and to provide feedback to those already consulted and a clear understanding of next steps.

7.4.1 Scope of further assessment

A robust and planned stakeholder engagement approach during construction will facilitate:

- highly engaged and informed stakeholders;
- an early understanding of issues and the ability to incorporate responses in planning for construction and discuss solutions and ways of minimising disruption;
- dialogue with local businesses and people to allow for A2I to maximise local employment, supply and subcontractor opportunities;
- the flow of positive information about the project to the community; and
- the provision of accurate and up to date information about project delivery.

Future possible concerns to address during construction activities are:

- Worker behaviour concerns -mitigated with on-boarding inductions, drug and alcohol tests and project vehicles fitted with in vehicle monitoring systems (IVMS);
- Dust from construction activities - mitigated by dust suppression and water trucks;
- Negative media - By working closely and developing a trusting work-relationship will lead to the publication of positive and informative pieces in the local media;
- Managing expectations and incoming enquiries from job applicants and suppliers - mitigated by robust recruitment and tender processes;
- Increased workforce traffic and road closures. Traffic management planning and proposal Traffic Notifications will assist to mitigate;and
- A diligent and transparent complaints and issues management process with clear lines of communication, timely resolution and a Grievance Management recording system.

Throughout construction the purpose is to clearly communicate information about the progress of the project, upcoming work and how impacts will be managed to key stakeholders. The provision of clear and accessible information early and often will assist to manage stakeholder expectations and keep stakeholders informed.

7.5 Consultation Summary and Next Steps

A robust and planned stakeholder engagement approach during construction will facilitate:

- highly engaged and informed stakeholders;
- an early understanding of issues and the ability to incorporate responses in planning for construction and discuss solutions and ways of minimising disruption;
- dialogue with local businesses and people to allow for A2I to maximise local employment, supply and subcontractor opportunities;
- the flow of positive information about the project to the community; and
- the provision of accurate and up to date information about project delivery.

Future possible concerns to address during construction activities are:

- Worker behaviour concerns -mitigated with on-boarding inductions, drug and alcohol tests and project vehicles fitted with in vehicle monitoring systems (IVMS);
- Dust from construction activities - mitigated by dust suppression and water trucks;
- Negative media - By working closely and developing a trusting work-relationship will lead to the publication of positive and informative pieces in the local media;
- Managing expectations and incoming enquiries from job applicants and suppliers - mitigated by robust recruitment and tender processes;
- Increased workforce traffic and road closures. Traffic management planning and proposal Traffic Notifications will assist to mitigate construction of the proposal; and
- A diligent and transparent complaints and issues management process with clear lines of communication, timely resolution and a Grievance Management recording system.

Throughout construction the purpose is to clearly communicate information about the progress of the project, upcoming work and how impacts will be managed to key stakeholders. The provision of clear and accessible information early and often will assist to manage stakeholder expectations and keep stakeholders informed.

8 Conclusion

The Inland Rail route, which is about 1,700 kilometres long, consists of 13 projects, seven of which are located within NSW. The Inland Rail is a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. This application relates to the **Albury to Illabo** section.

ARTC is proposing to upgrade the **Albury to Illabo** section, along the 185 kilometers of existing operational narrow gauge railway from the Victorian/New South Wales border to Illabo in regional NSW. The Proposal would provide clearance of the existing 'Main South' corridor to operate 1800 metres long, 6.5 metres high, double stacked trains and includes the provision of dual track in areas for train passing.

The Proposal is subject to environmental assessment under Part 5 of the EP&A Act. The capital investment value of the Proposal is estimated to be in excess of $50 million, and as a result the Proposal is SSI under the SRD SEPP. The Proposal requires approval from the NSW Minister for Planning and Public Spaces under Division 5.2 of the NSW EP&A Act. In addition, ARTC is seeking to have the Proposal declared as Critical SSI under Section 5.13 of the EP&A Act, also under clause 16 of SRD SEPP and amendment of Schedule 5 of the SRD SEPP.

This document comprises the first step in the approvals process through supporting an application to DPIE, seeking the SEARs for the EIS. The document has provided a brief description of the Proposal; its statutory and strategic context; stakeholder and community engagement undertaken to inform the design; and a preliminary assessment of environmental impacts.

Through the submission of this Scoping Report ARTC is seeking the SEARs to proceed with the development application process and preparation of an EIS for submission to DPIE as part of the first step in the approvals process for the Proposal.

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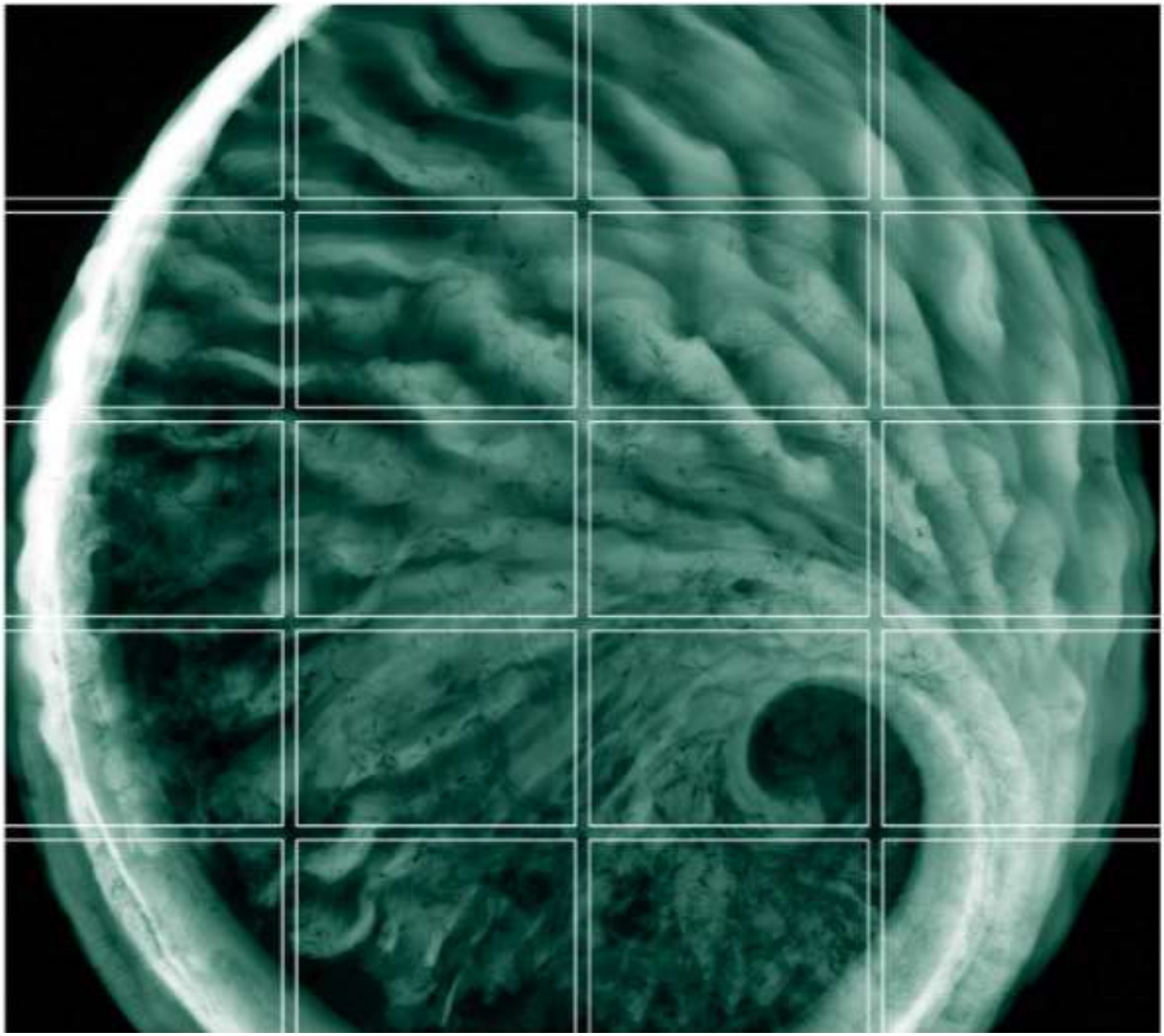
Appendix A Biodiversity Assessment



Australian Rail Track Corporation (ARTC)

Inland Rail – Albury to Illabo Project (A2I)

Biodiversity Assessment Report

2-0001-640-ESV-00-RP-0001_0

9 April 2020

Project No.: 0520125

The business of sustainability

ERM

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Signature Page

10 April 2020

Inland Rail – Albury to Illabo Project (A2I)

Biodiversity Assessment Report

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Acronyms and Abbreviations

Name	Description
A2I	Albury to Illabo
A2I Proposal site	All areas within the railway corridor extending between Albury to Illabo in NSW.
AOBV	Areas of Outstanding Biodiversity Value
ARTC	Australian Rail Track Corporation Ltd
BAM	Biodiversity Assessment Method
BAR	Biodiversity Assessment Report
BC Act	NSW Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offsets Scheme
BOSET	Biodiversity Offsets Scheme Entry Threshold
CSSI	Critical State Significant Infrastructure
DoEE	Commonwealth Department of the Environment and Energy
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EIS	Environment Impact Statement
Enhancement Sites	Discrete sites within the A2I Proposal site that are proposed for infrastructure enhancement. This includes the 12 key enhancement sites as well as the signal gantries. Enhancement works at each of these discrete work sites may include raising, widening or replacing bridges, raising or replacing signal gantries, and lowering sections of track
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ha	hectare
Infrastructure SEPP	State Environmental Planning Policy (Infrastructure) 2007
km	kilometre
LGA	Local Government Areas
Locality	refers to an area within a 10 km buffer around the A2I Proposal site
MBIR	Melbourne-Brisbane Inland Rail
MNES	Matters of National Environmental Significance
NSW	New South Wales
PMST	Protected Matters Search Tool
Proposal	The Albury to Illabo enhancement works along 185 kilometres of existing operational narrow gauge railway from the Victorian/New South Wales border to Illabo in regional NSW. The Proposal would provide clearance of the existing 'Main South' corridor to operate 1800 metre trains and includes the provision of dual track in some areas for train passing.
SAII	serious and irreversible impacts
SEARs	Secretary's Environmental Assessment Requirements

Name	Description
Slew Sites	Track slewing to provide horizontal clearance as required along selected sections of the Proposal
TEC	threatened ecological communities
VIS	Vegetation Information System
Won's	Weeds of National Significance

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by Australian Rail Track Corporation (ARTC) to prepare a Biodiversity Assessment Report, which will support the scoping report for the SEARs application for the SSI Proposal and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) Referral for the Inland Rail – Albury to Illabo (A2I) Enhancement Works project.

1.1 Background

The Australian Government has committed to delivering the Inland Rail Program, which is a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland.

Inland Rail is a major nation-building program that will enhance Australia's existing national rail network and service the interstate freight market.

The Inland Rail route, which is about 1,700 kilometres long, involves:

- Using the existing interstate rail line through Victoria and southern NSW.
- Upgrading about 400 kilometres of existing track, mainly in western NSW.
- Providing about 600 kilometres of new track, mainly in northern NSW and south-east Queensland.

The Inland Rail consists of 13 projects, seven of which are located within NSW. One of the projects is the A2I Project, which is comprised of enhancement works to structures and sections of track along 185 kilometres of existing rail corridor from the Victorian/New South Wales border to Illabo in regional NSW. Enhancement works to existing structures and track is required to provide the increased vertical and horizontal clearance required for double-stacked freight trains. Enhancement works include raising, widening or replacing bridges, raising or replacing signal gantries, and lowering sections of track.

The Proposal is subject to environmental assessment under Part 5 Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) through the effect of Division 15 of *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP). ARTC is defined as a public authority for rail infrastructure developments in accordance with clause 277(1) of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). The capital investment value of the Proposal is estimated to be in excess of $50 million, and as a result the Proposal is State Significant Infrastructure under *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). The Proposal requires approval from the NSW Minister for Planning and Public Spaces under Part 5, Division 5.2 of the EP&A Act. In addition, ARTC is seeking to have the Proposal declared as Critical State Significant Infrastructure under Section 5.13 of the EP&A Act, also under clause 16 of SRD SEPP and amendment of Schedule 5 of the SRD SEPP.

The Proposal will also be referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.2 Objectives

The objective of this assessment is to identify and describe key biodiversity values within the Proposal and to provide preliminary recommendations in terms of avoidance, mitigation and/or additional assessment required.

Biodiversity values are defined as those species and communities listed as vulnerable, endangered or critically endangered under the EPBC Act, and/or the NSW *Biodiversity Conservation Act 2016* (BC Act). This report is informed by a combination of:

- Desktop assessment and a review of previous field investigations and reports along the Proposal site (refer to Table 7); and
- Rapid Biological Values Assessments conducted in August 2019 to provide additional detail on key biodiversity values across the Proposal site. The rapid surveys were designed to verify and refine the presence/absence of biodiversity constraints from the Proposal, focusing in particular on listed threatened and endangered ecological communities as well as habitat capable of supporting listed threatened species.

The Report includes:

- Identification of actual and potential biodiversity values within the Proposal site, including the presence or potential presence of listed threatened species (and their habitats) and ecological communities;
- Description of biodiversity impacts and mitigation measures associated with the Proposal. Noting there is already an existing impact associated with the existing rail line, the focus of the impact assessment is on any additional impacts associated with the Proposal; and
- Description of outcomes and recommendations to support the ongoing Proposal design and assessment process.

This assessment has been prepared to support the Scoping Report and request for Secretary's Environmental Assessment Requirements (SEARs). The assessment has not been undertaken in accordance with the Biodiversity Assessment Method (BAM). This would be undertaken separately if required as part of the Environment Impact Statement (EIS) to be prepared under Part 5 of the EP&A Act.

1.3 Identification of the Proposal and Key Survey Areas

The project location definitions (and terms used throughout this report) include:

A2I Proposal site:	All areas within the existing 185 kilometre railway corridor extending between Albury to Illabo in NSW.
Enhancement Sites:	Discrete sites within the A2I Proposal site that are proposed for infrastructure enhancement. This includes the 12 key enhancement sites as well as the signal gantries. Enhancement works at each of these discrete work sites may include raising, widening or replacing bridges, raising or replacing signal gantries, and lowering sections of track as outlined in Table 1 and Table 2.
Locality:	Refers to an area within a 10 km buffer around the A2I Proposal site.
Slew Sites:	Track slewing to provide horizontal clearance is required along selected sections of the Proposal as outlined in Table 3.

The existing corridor operates single stacked freight trains 1,800m long, with impacts to biodiversity managed by ARTC business practices.

The Proposal includes the operation of double stack trains up to 1,800m long and 6.5m high and includes the provision of dual track in some areas for train passing, with a possible future upgrade to accommodate for 3,600m trains.

There is potential additional impacts to Threatened Species by way of wildlife strike due to the higher frequency of trains and use of double deck rolling stock.

Table 1 Identification of Enhancement Sites

No	Enhancement site	Site type	Area (hectare)	Enhancement type	Figure reference
Murray River Bridge Precinct					
1	Murray River Bridge	Rail underbridge	1.24	Raise the height of the existing arches and reinforce the bridge.	Appendix A. Map 1
Albury Station Precinct					
2	Albury Station Footbridge	Footbridge	16.00	Replace the existing over-rail section of the Albury Station Footbridge. Replacement section will tie into the recently built footbridge section over the Hume Freeway.	Appendix A. Map 2
	Albury Station Signal Box and Relay Room	Signal structures		Track slews required to clear these structures.	Appendix A. Map 2
3	Riverina Highway Bridge	Road overbridge		Track lowering of the Through and Loop tracks under the highway and associated works including retaining structures and drainage.	Appendix A. Map 2
Wagga Road Bridge					
4	Wagga Road / Billy Hughes Bridge	Bridge	4.87	Lower the track under the highway.	Appendix A. Map 3
Culcairn Footbridge					
5	Culcairn Footbridge	Footbridge	0.40	Removal of derelict footbridge.	Appendix A. Map 5
Pearson Street Bridge					
6	Pearson Street Bridge	Road overbridge	4.87	Lower the track underneath the bridge.	Appendix A. Map 10
Wagga Wagga Station Precinct					
7	Brookong Avenue Footbridge	Footbridge	0.25	Footbridge replacement.	Appendix A. Map 11
8	Edmondson Street Bridge	Road overbridge	4.34	Build a new bridge.	Appendix A. Map 11
9	Mothers Bridge (Wagga Wagga Station Access Footbridge)	Footbridge	0.31	Footbridge replacement.	Appendix A. Map 11
Junee Station Precinct					
10	Kemp Street Bridge	Road overbridge	2.12	Rebuild of the road bridge over the rail yard.	Appendix A. Map 14
11	Junee Station Footbridge	Footbridge	0.94	Removal of derelict footbridge.	Appendix A. Map 15
12	Olympic Highway Rail Underpass	Rail underpass		Replacement or modification of rail underbridge.	Appendix A. Map 15

Table 2 Trackside Structures

Trackside Structures*	Enhancement Type*	Area (ha)	Figure Reference
Signal gantry at chainage 632.860	Provision of signalling infrastructure	0.18	Appendix A. Map 4
Signal gantry at chainage 599.360	Provision of signalling infrastructure	0.08	Appendix A. Map 5
Signal gantry at chainage 583.076	Provision of signalling infrastructure	0.14	Appendix A. Map 6
Signal gantry at chainage 554.226	Provision of signalling infrastructure	0.18	Appendix A. Map 8
Signal gantry at chainage 538.413	Provision of signalling infrastructure	0.20	Appendix A. Map 9
Signal gantry at chainage 531.256	Provision of signalling infrastructure	0.14	Appendix A. Map 21
Signal gantry at chainage 523.871	Provision of signalling infrastructure	0.11	Appendix A. Map 11
Signal gantry at chainage 523.683	Provision of signalling infrastructure	0.10	Appendix A. Map 11
Signal gantry at chainage 499.145	Provision of signalling infrastructure	0.28	Appendix A. Map 13
Signal gantry at chainage 583.990	Provision of signalling infrastructure	0.17	Appendix A. Map 6
Signal gantry at chainage 553.841	Provision of signalling infrastructure	0.26	Appendix A. Map 8
Signal gantry at chainage 553.319	Provision of signalling infrastructure	0.21	Appendix A. Map 8
Signal gantry at chainage 553.040	Provision of signalling infrastructure	0.09	Appendix A. Map 8
Signal gantry at chainage 488.892	Provision of signalling infrastructure	0.11	Appendix A. Map 14

** Chainages are measured along the line from Central Railway Station, Sydney Central. i.e. Central Railway Station is Chainage 0.*

Note that the estimated number and the identification of these trackside structures are subject to further design and refinement.

Table 3 Slew Sites

Site Name	Area (ha)*	Length (m)	Figure Reference
Illabo to Junee	62.2415	15,487	Appendix A. Maps 17 - 20
Junee	2.7836	1,475	Appendix A. Map 16 *located within the Junee Station Precinct*
Harefield	5.2996	979	Appendix A. Map 13
Bomen	5.1038	1,150	Appendix A. Map 12
Wagga Wagga		680	Appendix A. Map 11 *located within the Wagga Wagga Station Precinct*
Uranquinty**	10.7119	1,900	Appendix A. Map 9
Yerong Creek	8.5528	1,200	Appendix A. Map 7
Henty	4.6483	654	Appendix A. Map 6
Culcairn	3.2811	474	Appendix A. Map 5
Albury		1,153	Appendix A. Map 2 *located within the Albury Station Precinct*

** For the purposes of this assessment, we have assumed that the Slew Sites cover the entire width of railway corridor and will include provision of aerial cable clearances and laydown areas. In many cases the track slewing will be carried out on both tracks and where required the track sidings, loops and lanes associated with slew sites may be modified consistent with ARTC design.*

***An ephemeral watercourse (Sandy Creek) intercepts the Uranquinty Track Slew Site. Transom Bridge will likely require replacement to accommodate this track slewing. It is likely that this watercourse provides important seasonal ecosystem function for local biodiversity.*

ILLABO
GANMAIN
COOLAMON
COOLAMON SHIRE COUNCIL
JUNEE
JUNEE SHIRE COUNCIL
NARRANDERA SHIRE COUNCIL
ESTELLA
COOTAMUNDRA-GUNDAGAI REGIONAL COUNCIL
WAGGA WAGGA
GUMLY GUMLY
FOREST HILL
URANQUINTY
WAGGA WAGGA CITY COUNCIL
LADYSMITH
LOCKHART
THE ROCK
TARCUTTA
LOCKHART SHIRE COUNCIL
HENTY
SNOWY VALLEYS COUNCIL
CULCAIRN
HOLBROOK
GREATER HUME SHIRE COUNCIL
WALLA WALLA
TUMBARUMBA
JINDERA
ALBURY CITY COUNCIL
MURRAY RIVER
ALBURY
BELLBRIDGE
WODONGA
KILLARA

Albury to Illabo

Figure 1 - A2I Proposal

MAP 1 OF 1

0 5 10 15 km

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:455,090
Data Sources: GA Geodata; Inset : Bing

LEGEND

- A2I Proposal
- Railway
- Major River
- LGA Boundary

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2. LEGISLATION

Table 4 below provides a description of the relevant legislative context. This report addresses the objectives and requirements of the legislation as it relates to the identification of biodiversity and ecological values. Impacts to these values will be addressed separately if required as part of the EIS to be prepared under Part 5 of the EP&A Act.

Table 4 Legislation applicable to A2I

Commonwealth Legislation
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
The EPBC Act requires approval of the Commonwealth Minister for the Environment for actions that are likely to have a significant impact on Matters of National Environmental Significance (MNES) as assessed in accordance with the EPBC Significant Impact Guidelines 1.1. The EPBC Act is administered by the Commonwealth Department of Environment and Energy (DoEE) and lists threatened species, ecological communities and other MNES. Any proposed action that is expected to have an impact on MNES must be referred to the Minister for assessment under the EPBC Act, or assessed under the existing bilateral agreement, or accredited process between the Commonwealth and the State of New South Wales (NSW).

Matters of National Environmental Significance	Application to the Subject Site
World heritage properties	Not identified within the Locality of Proposal site.
National heritage places	Not identified within the Locality of Proposal site.
Ramsar wetlands of international importance	Not identified within the Locality of Proposal site.
Listed threatened species and communities	Threatened species and ecological communities have been recorded within the Locality, including within the Proposal site.
Internationally protected migratory species	Migratory species identified as potentially occurring within the Locality.
Commonwealth marine areas	Not identified within the Locality of Proposal site.
The Great Barrier Reef Marine Park	Not identified within the Locality of Proposal site.
Nuclear actions	Not applicable to the Proposal.
A water resource, in relation to coal seam gas development and large coal mining development	Not applicable to the Proposal.

NSW Statutory Legislation and Guidelines

Biodiversity Conservation Act 2016 (BC Act)

The BC Act came into effect on 25 August 2017. The BC Act replaced the NSW *Threatened Species Conservation Act 1995*, the NSW *Nature Conservation Trust Act 2001* and parts of the NSW *National Parks and Wildlife Act 1974*. The BC Act establishes mechanisms for:

- The management and protection of listed threatened species of native flora and fauna (excluding fish and marine vegetation) and threatened ecological communities (TECs).
- The listing of threatened species, TECs and key threatening processes.
- The development and implementation of recovery and threat abatement plans.
- The declaration of critical habitat.
- The consideration and assessment of threatened species impacts in development assessment process.
- Biodiversity Offsets Scheme (BOS), including the Biodiversity Values Map and Biodiversity Assessment Method (BAM) to identify serious and irreversible impacts (SAII).

The BC Act establishes a new regulatory framework for assessing and offsetting biodiversity impacts on proposed developments. Where development consent is granted, the authority may impose as a condition of consent an obligation to retire a number and type of biodiversity credits determined under the Biodiversity Assessment Method (BAM). A Biodiversity Values Map and Biodiversity Offsets Scheme Entry Threshold (BOSET) tool are available to identify the presence of mapped biodiversity values within land proposed for development as well as the clearing thresholds that would trigger application of the BAM.

The Biodiversity Offsets Scheme applies to state significant development and state significant infrastructure projects, unless the Secretary of the Department of Planning, Industry and Environment determines that the Proposal is not likely to have a significant impact. Given that significant impact on threatened species is unlikely within the already highly disturbed operational alignment, ARTC will to seek a determination (BDAR waiver) from the Secretary under section 7.9(2) of the BC Act. If such a determination is made, the impacts to threatened species will still need to be considered in the EIS, but not in the form of a BDAR. In addition, Section. 7.14 of the BC Act, would not apply.

Local Land Services Act 2013

The Local Land Services Act 2013 (LLS Act) regulates the management of vegetation on rural land. The amendments to the LLS Act have resulted in a change to the criteria for native vegetation clearing. There are now three different land categories for clearing on rural land:

- Category 1 – 'Exempt land' which will not be subject to clearing approval;
- Category 2 – 'Regulated Land' on which clearing of native vegetation may be carried out with or without approval in accordance with an 'allowable activity' or 'code' under the LLS Act, and
- 'Excluded Land' – Land not categorised in the Regulatory Maps and to which the LLS Act does not apply.

All of the key enhancement and track slew sites are located within the rail corridor and a review of the Native Vegetation Regulatory Map (Regulatory Map) confirms that the existing rail corridor is mapped as 'Excluded 'Land' and assessment under Part 5 of the EP&A Act will apply.

Biosecurity Act 2015

The NSW *Biosecurity Act 2015* came into effect on 1 July 2017, effectively replacing the *Noxious Weeds Act 1993*, and 13 other Acts, with a single Act. Under the Noxious Weeds Act all landowners had a responsibility to control noxious weeds on their property. Under the Biosecurity Act broadly the same responsibility will apply and will be known as a General Biosecurity Duty.

The General Biosecurity Duty states "*Any person who deals with biosecurity matter or a carrier and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised*." The general biosecurity duty applies to all weeds listed in Schedule 3 of the Biosecurity Act. Primary weeds have been identified in different Local Government Areas (LGA) due to

the level of threat infestation they represent, some of the Weeds of National Significance (WoNS) are also listed as Primary Weeds in LGAs.

A strategic plan for each weed will be required at each site to define responsibilities and identify strategies and actions to control the weed species. These can be downloaded from: http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html

Fisheries Management Act 1994

The *Fisheries Management Act 1994* provides for the conservation, protection and management of fisheries, aquatic systems and habitats in NSW. Similar to the BC Act, the *Fisheries Management Act 1994* lists threatened species, populations and ecological communities of fish and marine vegetation. Consideration of likely occurrence of threatened fish in the waterways in the Proposal site will be provided within the EIS although it is noted that the Murray River and Murrumbidgee River provide potential habitat for the Flathead Galaxias and Macquarie Perch. The smaller ephemeral streams also provide potential habitat for the Southern Pygmy Perch.

Schedule 6 of the *Fisheries Management Act 1994* also lists the following key threatening process that may be relevant to this Proposal and will be addressed within the EIS:

- Degradation of native riparian vegetation along New South Wales water courses;
- Human-caused climate change; and
- Removal of large woody debris from New South Wales rivers and streams.

Any waterway crossings will need to consider an appropriately designed structure that does not obstruct fish passage and will be designed in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management and the Policy and Guidelines for Fish Friendly Waterway Crossings. Notwithstanding this, it is noted that a permit under section 219 would not be required for waterway crossings as Section 5.23 of the EP&A Act excludes SSI projects from requiring "a permit under section 201, 205 or 219 of the Fisheries Management Act 1994".

SEPP (Koala Habitat Protection) 2019

On 1 March 2020 the *State Environmental Planning Policy (Koala Habitat Protection) No.44* (SEPP 44) was repealed and replaced by the *State Environmental Planning Policy (Koala Habitat Protection) 2019* (Koala Habitat SEPP). The Koala Habitat SEPP aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline. The key changes to the Koala Habitat SEPP relate to the definitions of koala habitat; list of tree species; list of councils; and development assessment process.

Key changes include:

- The number of tree species considered important to koalas has expanded from 10 species to up to 65 species across nine distinct regions of NSW;
- A new 'Core Koala Habitat' definition being:
  - an area of land where koalas are present;
  - or an area of land which has been assess by a suitably qualified and experienced person in accordance with the Guideline as being highly suitable koala habitat; and
  - where koalas have been recorded as being present in the previous 18 years.

The SEPP applies to the Wagga Wagga, Lockhart and Hume LGAs, and only applies to development under Part 4 of the EP&A Act. The proposal is being assess under Part 5 of the EP&A Act and the Koala Habitat SEPP is not applicable, however it is anticipated that the Proposal would, as far as practicable, aim to be consistent with the objectives of the Koala Habitat SEPP.

3. METHODOLOGY

This Biodiversity Assessment aims to identify and described key biodiversity values within the A2I Proposal site and to provide preliminary recommendations in terms of avoidance, mitigation and/or additional assessment required.

3.1 Desktop Review

The following biodiversity investigations have previously been prepared for the Proposal site and have been incorporated into this assessment:

- EMM (2018a) Biodiversity Assessment – Riverina Highway Bridge, ARTC Inland Rail, Tottenham to Albury. Report prepared for KBR by EMM (reference J17209RP1; dated 8 June 2018)
- KBR (2018a) Inland Rail Phase 2 Tottenham to Illabo: Pearson Street Bridge Biodiversity Assessment REF 6. Report prepared for ARTC by Kellogg Brown & Root (KBR) (reference 2-0001-200-EAP-00-RP-0003 Rev. A, dated 19 April 2018).
- KBR (2018b) Inland Rail Phase 2 Tottenham to Illabo: Wagga Road Bridge Biodiversity Assessment REF 7. Report prepared for ARTC by Kellogg Brown & Root (KBR) (reference 2-0001-200-EAP-00-RP-0004 Rev. A, dated 19 April 2018).

The results of these previous surveys have been supplemented by an updated review of the following online resources:

- NSW Threatened Biodiversity Data Collection, including the Wildlife Atlas (BioNET), Vegetation Information System (VIS) database and threatened species profiles;
- Results of the Commonwealth Department of Environment and Energy's (DoEE's) Protected Matters Search Tool (PMST) identifying threatened species and communities with potential to occur within the locality (10 km buffer around the A2I Proposal site). The searches were conducted in the week commencing 5 August 2019;
- NSW SEED mapping to identify Plant Community Types (PCT), threatened species or communities known or likely to occur; Mitchell Landscapes, map of Interim Biographic Regionalisation of Australia (IBRA) version 7;
- Biodiversity Offset Scheme Entry Threshold (BOSET) mapping, version 8. Accessed online https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap;
- Key Fish Habitat maps accessed online via https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/key-fish-habitat-maps;
- Atlas of Living Australia (ALA) Database;
- Local government databases; and
- State Vegetation Type Map: *Riverina Region version 1.2 – VIS ID 4469* (OEH 2016).

3.2 Field Surveys

Two (2) ERM ecologists undertook field surveys within the Proposal site between 26 August 2019 and 29 August 2019, representing a total of 80 person hours. Rapid Biological Values Assessments were undertaken at each of the Enhancement Sites, Trackside Structures and Track Slew sites. As noted in Table 3, for the purposes of this assessment, we have assumed that the Track Slew sites cover the entire width of railway corridor and include provision of aerial cable clearances and laydown areas.

The purpose of the Rapid Biological Values Assessments was to identify important biological values within the Proposal site. Important biological values included:

- The presence of threatened fauna and flora species;
- Threatened ecological communities; and
- Habitat and resources considered important for threatened species or ecological communities.

Assessments included quantifying habitat features present, particularly those relevant to threatened species known to occur within the locality (based the results of the desktop assessment). This included relative vegetative cover, abundance of nesting/shelter/basking sites, presence of aquatic habitats, and presence of foraging resources, dominant canopy species, connectivity and disturbances.

Survey methodologies were designed to rapidly assess biodiversity values and were not undertaken in accordance within the BAM. No detailed riparian and aquatic habitat assessments have been completed to date.

3.3 Likelihood of Occurrence

Consistent with the accepted approach for biodiversity assessment, a likelihood of occurrence assessment was undertaken, informed by desktop sources and the field survey results. Desktop sources identified a number of fauna species listed under the EPBC Act and BC Act that have been recorded previously or are predicted to occur within a 10 km buffer of the A2I Proposal site. The likelihood of occurrence approach refines the desktop generated list using site-specific and specific-species habitat information. Desktop sources are indicative only and likelihood rankings, particularly in regard to the presence of preferred habitat, are conservative. The assessment ranks the likelihood of the species occurring within the A2I Proposal site through analysis of species distribution information and the presence of specific habitat attributes as identified through the desktop analysis and field survey. The criteria applied are outlined in Table 5.

Table 5 Likelihood of Occurrence Criteria

	Preferred habitat exists	Suitable habitat exists[1]	Habitat does not exist[2]
Records within A2I Proposal site (based field investigations)	Known	Known	Known
Records in the Locality[3]	Likely	Potential	Unlikely
No records in the Locality, but A2I Proposal site is within known distribution	Potential	Unlikely	Unlikely
No records in the Locality, and Proposal site is outside of distribution	Unlikely	Unlikely	Unlikely

1. *Habitat may be considered suitable, but not preferred because: some desired habitat features may be present, but not all; habitat may have poor connectivity; or habitat may be known to be disturbed.*
2. *Based on sources reviewed and/or field survey results.*
3. *'Locality' refers to a 10 km buffer of the A2I Proposal site.*

3.4 Assumptions and Limitations

The field and desktop assessment undertaken provides an overview of the biodiversity values that exist within the A2I Proposal site. Surveys were undertaken at discrete locations based on the proposed enhancement sites to gain a general understanding of the types of species and habitat features that occur. While not all portions of the A2I Proposal site could be visited during the field survey, the landscape and its features were generally consistent throughout.

The absence of a species from a database list or observational studies does not confirm its absence from the A2I Proposal site. The lack of existing records from databases may indicate a low historic sampling effort in the region, as opposed to an absence of species. Similarly, the timing of the August 2019 survey precludes the detection of a number of migratory and wader species that are typically absent from the area at that time of the year. Survey effort was limited due to rapid assessment approach.

To overcome these limitations, the likelihood of occurrence is based on the precautionary approach and identify species that have the potential to occur rather than relying on species sightings alone.

4. BIODIVERSITY VALUES

The general landscape within the locality is largely cleared, agricultural landscape with small pockets of remnant woodland associated with riparian and roadside corridors. Key landscape features and biodiversity values within the Proposal site are summarised in Table 6 below.

Table 6 Summary of Landscape Features and Biodiversity Values

Landscape Feature	Summary Notes
IBRA Bioregion	NSW South West Slopes Bioregion
Vegetation	The vast majority of the A2I Proposal site is within the existing rail corridor and is subject to regular rail maintenance activities (e.g. mowing and herbicide treatment), track developments and influences from surrounding agriculture, industrial and urban areas. This ongoing disturbance has resulted in the Proposal site being almost exclusively non-remnant vegetation characterised predominately by non-native grasslands. Exotic flora and invasive flora species were regularly found throughout the Proposal site. Small pockets of riparian and semi-cleared open woodland persists in isolated pockets only and include Threatened Ecological Communities (TEC) listed under the BC Act. The broader region of the Proposal site has also been subject to extensive clearing for agriculture, industry and urban uses.
Threatened ecological communities	One TEC has been recorded within the Proposal site: the BC Act listed White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland). These areas are not considered White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC listed under the EPBC Act as they do not meet the condition criteria. Specifically, they do not contain a predominantly native understorey and field survey confirmed less than 50% native species in the ground layer (EPBC Referral in prep).
Rivers, Streams and Estuaries	The A2I Proposal site is located within the Murray – Darling Basin and covers two sub-catchments, which include the Mid Murray and Murrumbidgee. Due to the linear nature of the Proposal, the Proposal site is intercepted and in close proximity to many watercourses, drainage features, wetlands, artificial dams and canals. Watercourses include major rivers such as the Murray River and several minor streams.
Threatened species	Known: ■ Squirrel Glider (*Petaurus norfolcensis*); ■ Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) (pers. comm David Sharpe); and ■ Superb Parrot (*Polytelis swainsonii*). Likely: ■ Sloane's Froglet (*Crinia sloanei*); ■ Little Lorikeet (*Glossopsitta pusilla*); ■ Major Mitchell's Cockatoo (*Lophochroa leadbeateri*); ■ Turquoise Parrot (*Neophema pulchella*);

Landscape Feature	Summary Notes
	■ Diamond Firetail (*Stagonopleura guttata*);and ■ Grey-headed Flying-fox (*Pteropus poliocephalus*).
Areas of Geological Significance	There are no karst, caves, crevices, cliffs or other areas of geological significance within the Proposal site.
Areas of Outstanding Biodiversity Value (AOBV)	There are no Areas of Outstanding Biodiversity Value (AOBV) within the A2I Proposal site.
High Biodiversity Values Map	The A2I Proposal site includes two areas considered of high biodiversity value in accordance with the NSW Biodiversity Values Map: ■ Murray River Bridge - Enhancement Site 1 (Riparian Vegetation); and ■ Uranquinty Track Slew Site (Riparian Vegetation). The A2I Proposal site is not located within any state, national or internationally protected areas.
Hollows and Hollow Bearing Trees	The riparian vegetation at Murray River Bridge - Enhancement Site 1 contained many large hollow logs and some dead woody vegetation, which could provide refuge habitat to a range of fauna species. Wagga Road Bridge - Enhancement Site 4 also contained some small hollow logs that could be used has habitat for reptile and small mammal species. Hollow bearing trees were recorded at Pearson Street Bridge - Enhancement Site 6, Bomen Track Slew Site and the Junee to Illabo Track Slew Site. These trees are likely provide important biodiversity benefits, particularly for birds and arboreal mammals.

4.1 Summary of Previous Biodiversity Assessments

Three (3) Enhancement Sites and ten (10) Trackside Structures have been previously assessed within the A2I Proposal site. A summary of these investigations is provided in Table 7 and the results have been incorporated into this assessment report.

Table 7 Previous Biodiversity Investigations

Biodiversity Assessments	EMM (2018a) Biodiversity Assessment – Riverina Highway Bridge	KBR (2018a) Inland Rail Phase 2 Tottenham to Illabo: Pearson Street Bridge Biodiversity Assessment REF 6	KBR (2018b) Inland Rail Phase 2 Tottenham to Illabo: Wagga Road Bridge Biodiversity Assessment REF 7
Survey Area	■ Enhancement Site 3	■ Enhancement Site 6	■ Enhancement Site 4
Survey Date	■ 20 February 2018	■ 22 February 2018	■ 21 February 2018
Survey Methods	■ plot and vegetation transect surveys; ■ targeted flora searches; ■ mapping of native vegetation and any listed ecological communities; and ■ identification of threatened fauna and their habitats.	■ one BAM plot; ■ one transect; and ■ one diurnal bird survey.	■ targeted surveys for threatened birds; ■ targeted surveys for threatened TECs; ■ two flora plots and one BAM plot; and ■ mapping of native vegetation and any listed ecological communities.
Native vegetation	■ disturbed land; ■ no-native grasslands are present at the site; and ■ native vegetation completely removed.	■ native vegetation has been completely removed and replaced with exotic grassland.	■ non-native grasses; and ■ an area of 0.326 ha of Blakely's Red Gum – Yellow Box Grassy tall woodland of the NSW South Western Slopes bioregion woodland (PCT 277).
Fauna habitat	■ fauna habitat is highly limited within the site; and ■ low potential for Striped Legless Lizard habitat to occur.	■ fauna habitat is highly limited; and ■ low potential for: - Black Falcon (*Falco subniger*); and - Southern Myotis (*Myotis macropus*).	■ foraging resources for common species in the grassy and woodland vegetation; and ■ potential foraging habitat for seven threatened species: - Dusky Woodswallow (*Artamus cynopterus cyanopterus*); - Spotted Harrier (*Circus assimilis*); - Turquoise Parrot (*Neophema pluchella*); - Little Lorikeet (*Glossopitta pusilla*); - Brown Treecreeper (*Climacteris picumnus*); - Varied Sittella (*Daphoenositta chrysoptera*); and - Yellow-bellied Sheathtail Bat (*Saccolaimus falviventris*).

Biodiversity Assessments	EMM (2018a) Biodiversity Assessment – Riverina Highway Bridge	KBR (2018a) Inland Rail Phase 2 Tottenham to Illabo: Pearson Street Bridge Biodiversity Assessment REF 6	KBR (2018b) Inland Rail Phase 2 Tottenham to Illabo: Wagga Road Bridge Biodiversity Assessment REF 7
Threatened species	■ no threatened species identified.	■ no threatened species identified.	■ no threatened species identified.
Threatened Ecological Communities	■ no threatened ecological communities identified.	■ no threatened ecological communities identified.	■ Blakely's Red Gum – Yellow Box Grassy tall woodland not considered a TEC under EPBC Act 1999 or BC Act 2016.
Conclusions	■ the assessment concluded that the proposed works would have no impact on species, populations and/or communities listed under the BC Act and the EPBC Act.	■ minor and temporary loss of grassland habitat to occur during the construction phase; and ■ indirect impacts to an adjacent drainage canal and individual trees	■ Wagga Road Bridge - Enhancement Site 4 is not located within the area containing the EEC, and with appropriate management measures put in place the proposal is considered not to have an impact on this EEC.

4.2 Vegetation

The vast majority of the A2I Proposal site is within the existing rail corridor and is subject to regular rail maintenance activities (e.g. mowing and herbicide treatment), track developments and influences from surrounding agriculture, industrial and urban areas.

This ongoing disturbance has resulted in the Proposal site being almost exclusively non-remnant vegetation characterised predominately by non-native grasslands. Exotic flora and invasive flora species were regularly found throughout the Proposal site (refer to the key vegetation and landscape features as identified in Table 9 and Table 11). Small pockets of riparian and semi-cleared open woodland persists in isolated pockets only.

A total of 38 flora species were identified within the A2I Proposal site. A full list of species recorded during the field surveys is provided in Appendix B. No threatened flora species were identified during the field surveys.

Seven (8) invasive flora species were identified during the field surveys. Several of these invasive flora species are restricted species in accordance with Federal and State Legislation (Table 8). Three (3) species are considered Weeds of National Significance and two (2) species are considered NSW Noxious Weeds.

Table 8 Invasive Flora known from A2I Proposal site

Scientific name	Common name	Weed of National Significance	NSW Noxious Weed
Salix Nigra	Black Willow	Yes	Yes
Ligustrum lucidum	Broad-leaved Privet	No	No
Cirsium vulgare	Spear Thistle	No	No
Solanum mauritianum	Wild Tobacco	No	No
Lycium ferocissimum	African Boxthorn	Yes	Yes
Senecio pterophorus	African Daisy	No	No
Asparagus aethiopicus	Climbing Asparagus	Yes	No
Ligustrum sinense	Small Leaved Privet	No	No

Table 9 Native Vegetation and Landscape Characteristics within Enhancement Sites

Site	Rivers, streams, estuaries and wetlands	Biodiversity Values Map	Landscape Connectivity	Mapped Plant Community Type	Associated Threatened Ecological Community
Murray River Bridge Precinct					
1	The Murray River meanders through the area. A bridge extends over the Murray River. Oddies Creek also meanders through the area. The river banks are stable and the heterogeneity of microhabitats present likely support a diverse range of aquatic and semi-aquatic species.	The riparian vegetation along the Murray River is mapped within the Biodiversity Values boundary.	The majority of the area has been subject to extensive clearing. Cleared areas are mostly subject to disturbances (e.g. rail infrastructure, roads). Vegetation is limited to riparian corridors along Murray River and Oddies Creek which was noted to support range of habitat resources including hollow bearing trees and logs nests, mistletoe and an abundance of frog habitat. Riparian vegetation along the Murray River in the immediate region of the Enhancement Site is highly fragmented and sporadic. Riparian vegetation along Oddies Creek is consistent and less fragmented. External connectivity is limited due to extensive clearing and large natural barriers (e.g. Murray River).	The majority of the area is mapped as non-remnant vegetation. Although, riparian vegetation is mapped as PCT 5. PCT 5 = River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion.	No
Albury Station Precinct					
2 3	No rivers, creeks or other water bodies are present within the Enhancement Site. An artificial wetland exists within 1 km north of the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers. Some woody vegetation is present, although, is isolated.	This Enhancement Site is mapped as non-remnant vegetation.	No
Wagga Road Bridge					
4	No rivers, creeks or other water bodies are present within the Enhancement Site. Artificial dams and drainage features exists within 1 km of the Enhancement Site.	Not located within Biodiversity Values boundary.	The majority of the area has been subject to extensive clearing. The Enhancement Site includes three small woodland patches. These woodlands are fragmented moderate ecological connectivity. The following terrestrial habitat values were recorded: ■ Small log hollows present (reptile and small mammal habitat); and ■ Mistletoe present (foraging resource). Native species present were: ■ *Eucalyptus blakeyi;* ■ *Eucalyptus bridgesiana;* ■ *Eucalyptus albens; and* ■ *Acacia delbata*. These three woodland patches formed 'Box Gum Woodland TEC' in accordance with the BC Act. All patches were evaluated and considered likely to respond to assisted natural regeneration.	The majority of the area is mapped as non-remnant. Although, some woodland patches within the footprint are mapped as PCT 277 and 278. PCT 277: Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South-western Slopes Bioregion. PCT 278: Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South-western Slopes Bioregion.	0.45 ha of White Box – Yellow Box – Blakely's Red Gum Woodland intercepts the Proposal site. Note that this entire area of TEC is to be avoided during detailed design. **BC Act:** EEC **EPBC Act:** No These areas are not listed under the EPBC Act as they do not meet the condition criteria. Specifically, they do not contain a predominantly native understorey and field survey confirmed less than 50% native species in the ground layer.

Site	Rivers, streams, estuaries and wetlands	Biodiversity Values Map	Landscape Connectivity	Mapped Plant Community Type	Associated Threatened Ecological Community
Culcairn Footbridge					
5	No rivers, creeks or other water bodies are present within the Enhancement Site. A small wetland is located within 1km of the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Pearson Street Bridge					
6	Two large artificial wetland are located within the Enhancement Site. Artificial canals are located within the Enhancement Site.	Not located within Biodiversity Values boundary.	Woodland and shrublands appear to be present within the Enhancement Site. There is some internal connectivity among vegetation around the artificial wetland. Although, historic clearing has caused fragmentation and isolated this vegetation from the broader landscape.	This Enhancement Site is mapped as non-remnant vegetation.	No
Wagga Wagga Station Precinct					
7	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
8	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
9	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Junee Station Precinct					
10	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers. Some woody vegetation is present, although, it is noted as being isolated.	This Enhancement Site is mapped as non-remnant vegetation.	No
11 12	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No

Table 10 Native Vegetation and Landscape Characteristics within Trackside Structures

Structure*	Rivers, streams, estuaries and wetlands	Biodiversity Values Map	Landscape Connectivity	Mapped Plant Community Type	Associated Threatened Ecological Community
Signal gantry at chainage 632.86KM	No rivers, creeks or other water bodies are present within the Enhancement Site. Several artificial dams are located within 1 km of the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Lack of woody vegetation within Enhancement Site, Minimal woody vegetation within broader landscape.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 599.360KM	No rivers, creeks or other water bodies are present within the Enhancement Site. A small wetland is located within 1km of the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 583.076KM	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 554.226KM	No rivers, creeks or other water bodies are present within the Enhancement Site. An artificial dam is located within 1km of the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 538.413KM	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 531.256KM	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 523.871KM	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 523.683KM	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 499.145KM	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located amongst cropping agriculture landscape with minimal native vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 583.99KM	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within a semi-urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No

Structure*	Rivers, streams, estuaries and wetlands	Biodiversity Values Map	Landscape Connectivity	Mapped Plant Community Type	Associated Threatened Ecological Community
Signal gantry at chainage 553.841KM	No rivers, creeks or other water bodies are present within the Enhancement Site. The Enhancement Site is adjacent to several large dams and vegetated wetland areas.	Not located within Biodiversity Values boundary.	The immediate area lacks woody vegetation and is highly fragmented. However, several woodlands exist in close proximity to the Enhancement Site. The broader landscape has been subject to extensive clearing for urban development and agricultural expansion.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 553.319KM	No rivers, creeks or other water bodies are present within the Enhancement Site. The Enhancement Site is within 1 km of several large dams and vegetated wetland areas.	Not located within Biodiversity Values boundary.	The immediate area lacks woody vegetation and is highly fragmented. However, several woodlands exist in close proximity to the Enhancement Site. The broader landscape has been subject to extensive clearing for urban development and agricultural expansion.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 553.040KM	No rivers, creeks or other water bodies are present within the Enhancement Site. The Enhancement Site is within 1 km of several large dams and vegetated wetland areas.	Not located within Biodiversity Values boundary.	The immediate area lacks woody vegetation and is highly fragmented. However, several woodlands exist in close proximity to the Enhancement Site. The broader landscape has been subject to extensive clearing for urban development and agricultural expansion.	This Enhancement Site is mapped as non-remnant vegetation.	No
Signal gantry at chainage 488.892KM	No rivers, creeks or other water bodies are present within the Enhancement Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Enhancement Site is mapped as non-remnant vegetation.	No

** The estimated number and the identification of these trackside structures are subject to further design and refinement.*

Table 11 Native Vegetation and Landscape Characteristics for Track Slew Sites

Site	Rivers, Streams, Estuaries and Wetlands	Biodiversity Values Map	Landscape Connectivity	Mapped Plant Community Type	Associated Threatened Ecological Community within Proposal site.
Illabo to Junee	The Illabo to Junee Track Slew Site intercepts (bridges) three (3) permanent watercourses. The Illabo to Junee Track Slew Site intercepts (culverts) four (4) small drainage features, which include artificial channels and natural drainage lines.	Not located within Biodiversity Values boundary. Jeralgambeth Creek (mapped on the Biodiversity Values Map) is located within 100m of the slew site. Billabong Creek is also located within 100m to the north of the A2I Proposal site.	Highly fragmented. Located within cleared cropping farmland and urban environment with a range of artificial barriers and minimal patchy vegetation	The majority of the area is mapped as non-remnant vegetation. However, there is a large area of the Slew Site (~8 ha) that is mapped as PCT 76. PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions A small area of the Track Slew Site (~<1 ha) is mapped as PCT 276. PCT 276: Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion Also, remnant vegetation is mapped along several sections of the Track Slew Site boundary.	No. Two (2) woodland patches characterised by PCT 277 was recorded adjacent to the slew site. These woodland patches aligned with the species composition and community structure of the White Box – Yellow Box – Blakely's Red Gum Woodland TEC as listed under the BC Act.
Junee	No rivers, creeks or other water bodies are present within this Ttrack Slew Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal patchy vegetation.	Mapped as non-remnant vegetation.	No
Harefield	No rivers, creeks or other water bodies are present within this Track Slew Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an industrial environment with a range of artificial barriers and minimal patchy vegetation.	The majority of the area is mapped as non-remnant vegetation. Parts of the southern boundary is mapped as PCT 276. PCT 276: Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	No
Bomen	No rivers, creeks or other water bodies are present within this Track Slew Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an industrial environment with a range of artificial barriers and minimal patchy vegetation.	The majority of the area is mapped as non-remnant vegetation. The southern boundary is mapped as PCT 277: Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South-western Slopes Bioregion. This woodland vegetation was not recorded during the field survey and no TEC are reported in this locality.	No
Wagga Wagga	No rivers, creeks or other water bodies are present within this Track Slew Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	Mapped as non-remnant vegetation.	No

Site	Rivers, Streams, Estuaries and Wetlands	Biodiversity Values Map	Landscape Connectivity	Mapped Plant Community Type	Associated Threatened Ecological Community within Proposal site.
Uranquinty	An ephemeral watercourse (Sandy Creek) intercepts this Track Slew Site. No surface water was present during the August 2019 survey although the soil appeared to be moister than the areas immediately adjacent and water dependent flora species such as the River Red Gum (*Eucalyptus camaldulensis*) were also present. It is likely that this watercourse provides important seasonal ecosystem function for local biodiversity.	The riparian vegetation along the ephemeral watercourse is mapped within the Biodiversity Values boundary.	The majority of the area has been subject to extensive clearing and contains numerous planted native trees and shrubs (e.g. *Casuarina cunninghamiana* and *Grevillea* spp). Cleared areas are mostly subject to disturbances (e.g. rail agriculture). Potential frog habitat is present within riparian corridor. The noted presence of ~6 large *Eucalyptus camaldulensis* also provides habitat for *Pteropus poliocephalus*, *Phascolarctos cinereus* and other arboreal mammals. Vegetation along the watercourse is consistent and provides important ecological connectivity. The watercourse is likely an important corridor for local fauna.	The majority of the Track Slew Site is mapped as non-remnant vegetation. The watercourse section that intercepts the Track Slew Site is mapped as PCT 74 (0.21 ha). Several scattered *Eucalyptus melliodora* individuals were present although it is not considered Box-Gum Woodland TEC as there is not a predominately native understorey (EPBC Act) and the areas are unlikely to respond to assisted natural regeneration (BC Act). PCT 74 = Yellow Box - River Red Gum tall grassy riverine woodland of NSW South Western Slopes Bioregion and Riverina Bioregion	No
Yerong Creek	No rivers, creeks or other water bodies are present within this area. Small farm dams are located within 1km of the Track Slew Site.	Not located within Biodiversity Values boundary. However, located within 100m of a Biodiversity Values area.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Track Slew Site is mapped as non-remnant vegetation.	No
Henty	Predominately located within an urban environment within minimal aquatic values. However, a vegetated wetland and watercourse is located in close proximity (<100m) to the northern section of the Track Slew Site.	Located within 100m of a Biodiversity Values area.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	The Track Slew Site is mapped as non-remnant vegetation. However, immediately adjacent (<1m) to the northern section of the Track Slew Site is mapped as PCT 5. PCT 5 = River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion.	No The vegetation immediately adjacent to the Track Slew Site is consistent with PCT 278 (Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South-western Slopes Bioregion), which is associated with Box Gum Woodland TECs. Indirect impacts will need to be considered at this site.
Culcairn	No rivers, creeks or other water bodies are present within the Track Slew Site. A small wetland is located within 1km of the Track Slew Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers and minimal vegetation.	This Track Slew Site is mapped as non-remnant vegetation.	No The vegetation immediately adjacent to the Track Slew Site is consistent with PCT 278 (Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South-western Slopes Bioregion), which is associated with Box Gum Woodland TECs. Indirect impacts will need to be considered at this site.
Albury	No rivers, creeks or other water bodies are present within the Track Slew Site. An artificial wetland exists within 1 km north of the Track Slew Site.	Not located within Biodiversity Values boundary.	Highly fragmented. Located within an urban environment with a range of artificial barriers. Some woody vegetation is present, although it is noted as being isolated.	This Track Slew Site is mapped as non-remnant vegetation.	No

4.3 Threatened Ecological Communities

4.3.1 Within the A2I Proposal site

Three (3) woodland patches characterised by PCT 277 intercepts parts of the A2I Proposal site at Wagga Road Bridge - Enhancement Site 4. Enhancement Site 4 was predominately cleared and subject to a range of disturbances such as vehicle tracks, invasive flora infestations, noise pollution and soil erosion. These woodland patches aligned with the species composition and community structure of the Box Gum Woodland TEC as listed under the BC Act based on the following reasons:

- Located within NSW South West Slopes;
- Vegetation patches would likely respond to assisted natural regeneration;
- White Box, Yellow Box or Blakely's Red Gum, or a combination of these species, are or were present; and
- The site is predominantly grassy.

The three (3) woodland patches could not be considered a TEC under the EPBC Act because all patches did not 'have a predominately native understorey'[1]. The understorey at these areas was dominated by non-native grasses and herbaceous weeds. Field survey confirmed less than 50% native species in the ground layer.

As shown in Figure 2, the northern woodland patch is approximately 0.24 ha. The central woodland patch is approximately 0.79 ha. The southern woodland patch is approximately 1.20 ha. Much of these areas extend outside of Enhancement Site 4. The total area of White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) TEC within the Enhancement Site 4 itself is 0.45 ha and will be avoided during detailed design. This area must be clearly delineated in the field and on all construction drawings as a no go zone. Further management and mitigation measures will be detailed in the EIS.

It is important to note that there is a Preliminary Determination for changing this EEC from threatened to critically endangered currently on exhibition until 7 Feb 2020. The final listing of this community will be confirmed and addressed within the EIS.

4.3.2 Adjacent to Proposal

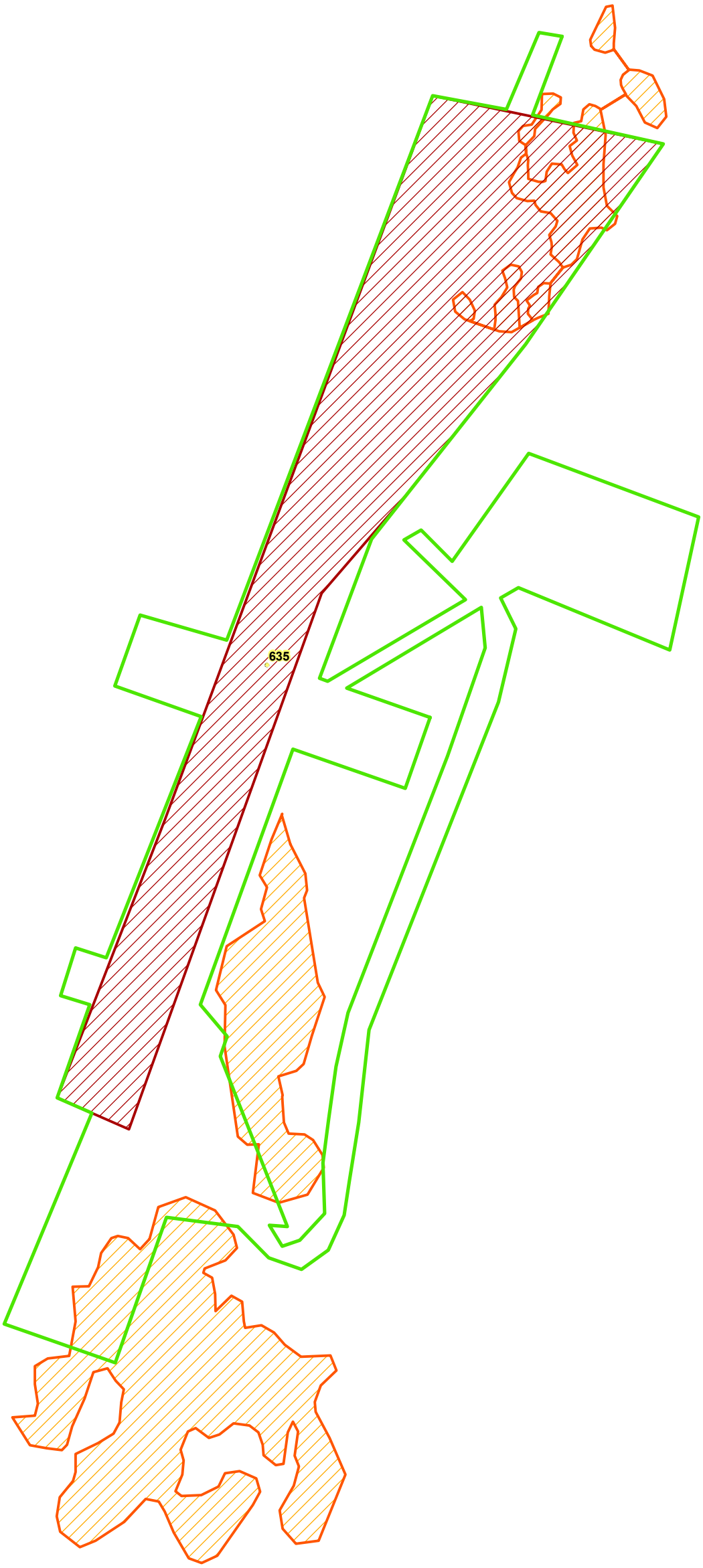
During the field surveys, an additional three (3) woodland patches in proximity to the A2I Proposal site were also identified as potential TECs.

Junee – Illabo Track Slew Site

At the Junee – Illabo Track Slew Site, two (2) *Eucalyptus* woodland patches were identified as likely to meet the TEC criteria under BC Act for a Box Gum Woodland for the following reasons:

- Located within NSW South West Slopes;
- Vegetation patches would likely respond to assisted natural regeneration;
- White Box, Yellow Box or Blakely's Red Gum, or a combination of these species, are or were present; and
- The site is predominantly grassy.

[1] A predominantly native ground layer is one where at least 50% of the perennial vegetation cover in the ground layer is made up of native species.



TEC to be avoided during detailed design

596.5

Albury to Illabo

Figure 3 - Box Gum Woodland TEC adjacent to Culcairn Track Slew Site

MAP 1 OF 1

0 20 40 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:2,700
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Track Slew
- Enhancement Sites
- Potential Box Gum Woodland TEC
- Previous Survey
- Drainage

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Albury to Illabo

Figure 4 - Box Gum Woodland TEC adjacent to Illabo to Junee Track Slew Site (sheds)

MAP 1 OF 1

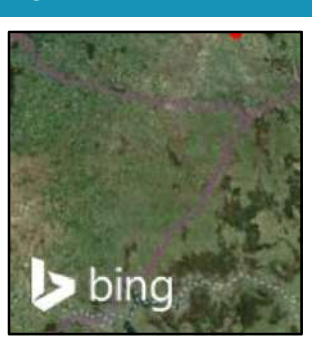
0 20 40 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Track Slew
- Box Gum Woodland TEC
- Drainage

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:3,330
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing



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Albury to Illabo

Figure 5 - Box Gum Woodland TEC adjacent to Illabo to Junee Track Slew Site (farmland)

MAP 1 OF 1

0 20 40
m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Track Slew
- Box Gum Woodland TEC
- Drainage

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:4,400
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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The two (2) woodland patches at the Junee – Illabo Slew Site could not be considered a TEC under the EPBC Act because they did not 'have a predominately native understorey'. The TEC woodland patch adjacent to the large sheds in the town of Illabo was approximately 0.0488 ha (Figure 4). The TEC woodland patch adjacent to the farmland in between Junee and Illabo was approximately 0.32 ha (Figure 5). Both woodland patches are immediately adjacent to the Junee – Illabo Track Slew Site (<5m).

Culcairn Track Slew Site

At the Culcairn Track Slew Site, the *Eucalyptus* woodland was recorded to be consistent with PCT 278 (Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South-western Slopes Bioregion), which is also associated with Box Gum Woodland TECs (Figure 3).

The woodland patch was approximately 0.85 ha. The woodland patch is immediately adjacent (<5m) to the Culcairn Track Slew Site with many trees overhanging. The patch contained several *Eucalyptus blakelyi* and had an established understorey. Additional botanical surveys should be undertaken within this area to determine if it does meet the criteria of a TEC.

4.4 Aquatic Habitat Values

The A2I Proposal site is located within the Murray – Darling Basin and covers two sub-catchments, which include the Mid Murray and Murrumbidgee. Due to the linear nature of the Proposal, the Proposal site is intercepted and in close proximity to many watercourses, drainage features, wetlands, artificial dams and canals. Watercourses include major rivers such as the Murray River and several minor streams. A review of the Department of Primary Industries Key Fish Habitat maps (refer to Appendix F) confirm that these waterways have the potential to provide important aquatic habitat resources and will be addressed within the EIS.

Field surveys did not aim to assess aquatic fauna and flora communities, rather they aimed to identify aquatic areas with high biodiversity value.

Murray River Bridge - Enhancement Site 1 incorporates riparian and aquatic habitat along the Murray River and Oddies Creek. Field surveys identified that Enhancement Site 1 contained robust banks with a multitude of microhabitats presents (e.g. logs, macrophytes). It is likely that Enhancement Site 1 would be considered important for local aquatic fauna and flora.

Plate 1: Murray River

Plate 2: Oddies Creek

Pearson Street Bridge - Enhancement Site 6 incorporates one (1) artificially constructed wetland and is immediately adjacent to another artificially constructed wetland. These wetlands contain native riparian vegetation and native macrophytes. Bank erosion is minimal. Although these are artificially constructed, they would likely be considered important for local aquatic fauna and flora.

Plate 3: Artificial wetlands at Pearson Street Bridge - Enhancement Site 6

Plate 4: Artificial wetlands at Pearson Street Bridge - Enhancement Site 6

The Uranquinty Track Slew Site intercepts a moderately vegetated ephemeral watercourse with several *Eucalyptus camaldulensis* and non-native grasses and herbs. At present, a railway bridge extends over this watercourse and will need to be replaced. No surface water was present but the soil appeared to be moister (waterlogged) than the areas immediately adjacent. Water dependent flora species were also present such as the River Red Gum (*Eucalyptus camaldulensis*). It is likely that this watercourse provides important seasonal ecosystem function for local biodiversity.

Plate 5: Ephemeral watercourse at Uranquinty Track Slew Site. Bridge to be replace at this location.

Plate 6: Ephemeral watercourse at Uranquinty Track Slew Site

Henty Track Slew Site, Culcairn Track Slew Site, Culcairn Footbridge - Enhancement Site 5, are all located in close proximity to vegetated wetland and vegetated watercourses. These aquatic features would be unlikely to interact with these Enhancement Sites and Trackside structures, however, these areas could be impacted by future development activity and mitigation measures should be considered.

4.5 Terrestrial and Riparian Habitat Values

Six (6) Rapid Woodland Habitat Assessments were undertaken at three (3) Enhancement Sites that contained sufficient woodland habitat to assess. In summary:

- Murray River has some conservation value but with significant levels of disturbance.
- Oddies Creek is degraded with significant loss of resilience and no regeneration occurring.
- Open woodland habitats at Wagga Road Bridge - Enhancement Site 4 and Pearson Street Bridge – Enhancement Site 6 had some disturbance and some loss of resilience but should be considered ecologically important.

Potential and confirmed frog habitat was also identified at 15 locations within the A2I Proposal site. Frog habitat varied from established permanent wetlands and dams to small grassy inundated areas. The aquatic habitat identified in Murray River Bridge - Enhancement Site 1 and Pearson Street Bridge – Enhancement Site 6 would likely be considered important frog habitat (refer to Figure 6). As identified in Table 12, the A2I Proposal site also contained several semi-permanent and permanent water sources, which could be utilised during times of drought for the BC Act and EPBC Act listed *Crinia sloanei* (Sloane's Froglet).

The riparian vegetation at Murray River Bridge - Enhancement Site 1 contained many large hollow logs and some dead woody vegetation, which could provide refuge habitat to a range of fauna species. Enhancement Site 4 also contained some small hollow logs that could be used has habitat for reptile and small mammal species.

Pearson Street Bridge – Enhancement Site 6 contained a large hollow bearing tree, which could provide habitat for arboreal mammals or birds, although this area was highly disturbed by urban impacts. Another hollow bearing tree was identified at the Bomen Track Slew Site. The biodiversity value of this hollow bearing tree may be limited as it was isolated and within an industrialised environment. The Junee to Illabo Slew Site had many large hollow bearing trees adjacent to the boundary. These trees likely provide important biodiversity benefits, particularly for birds and arboreal mammals.

A total of two (2) cup shaped nests were recorded during the field surveys. Both were small and found in mid-storey *Acacia saligna*. One (1) nest was found at Murray River Bridge - Enhancement Site 1 and the other found at Pearson Street Bridge – Enhancement Site 6. In addition to the cup shaped nests, 21 mud nests were found within culverts throughout the A2I Proposal site. Culverts were also inspected for microbats. Many of the culverts inspected contained suitable microbat roosting habitat although no evidence of microbat roosts were identified.

Mistletoe was occasionally identified throughout the Proposal site (Junee to Illabo Track Slew Site, Enhancement Sites 1, 2 and 9). It is likely that the mistletoe provides an additional food source for many bird and mammal species.

MURRAY RIVER

Albury to Illabo

Figure 6 - Frog Habitat within A2I Proposal site

MAP 1 OF 7

0 20 40 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 12/02/2020 Paper: A3
Author: ERM Scale: 1:1,260
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- Frog Habitat
- ARTC KM Posts
- Slew
- Enhancement Sites
- Previous Survey
- Drainage

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Albury to Illabo

Figure 6 - Frog Habitat within A2I Proposal site

MAP 2 OF 7

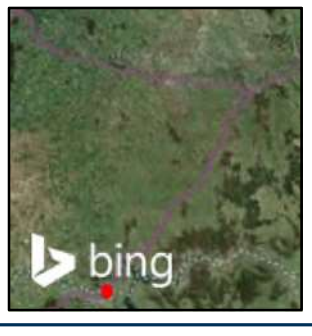
0 20 40
m

Coordinate System: GDA 1994 MGA Zone 55

Date: 12/02/2020 Paper: A3
Author: ERM Scale: 1:5,590
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- Frog Habitat
- ARTC KM Posts
- Slew
- Enhancement Sites
- Previous Survey
- Drainage



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635

Albury to Illabo

Figure 6 - Frog Habitat within A2I Proposal site

MAP 3 OF 7

0 20 40 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 12/02/2020 Paper: A3
Author: ERM Scale: 1:1,850
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- Frog Habitat
- ARTC KM Posts
- Slew
- Enhancement Sites
- Previous Survey
- Drainage

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Albury to Illabo

Figure 6 - Frog Habitat within A2I Proposal site

0 20 40 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 12/02/2020 Paper: A3
Author: ERM Scale: 1:2,700

Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- Frog Habitat
- ARTC KM Posts
- Slew
- Enhancement Sites
- Previous Survey
- Drainage

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Albury to Illabo

Figure 6 - Frog Habitat within A2I Proposal site

MAP 5 OF 7

0 20 40 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Frog Habitat
- ARTC KM Posts
- Slew
- Previous Survey
- Drainage

Date: 12/02/2020 Paper: A3
Author: ERM Scale: 1:2,210
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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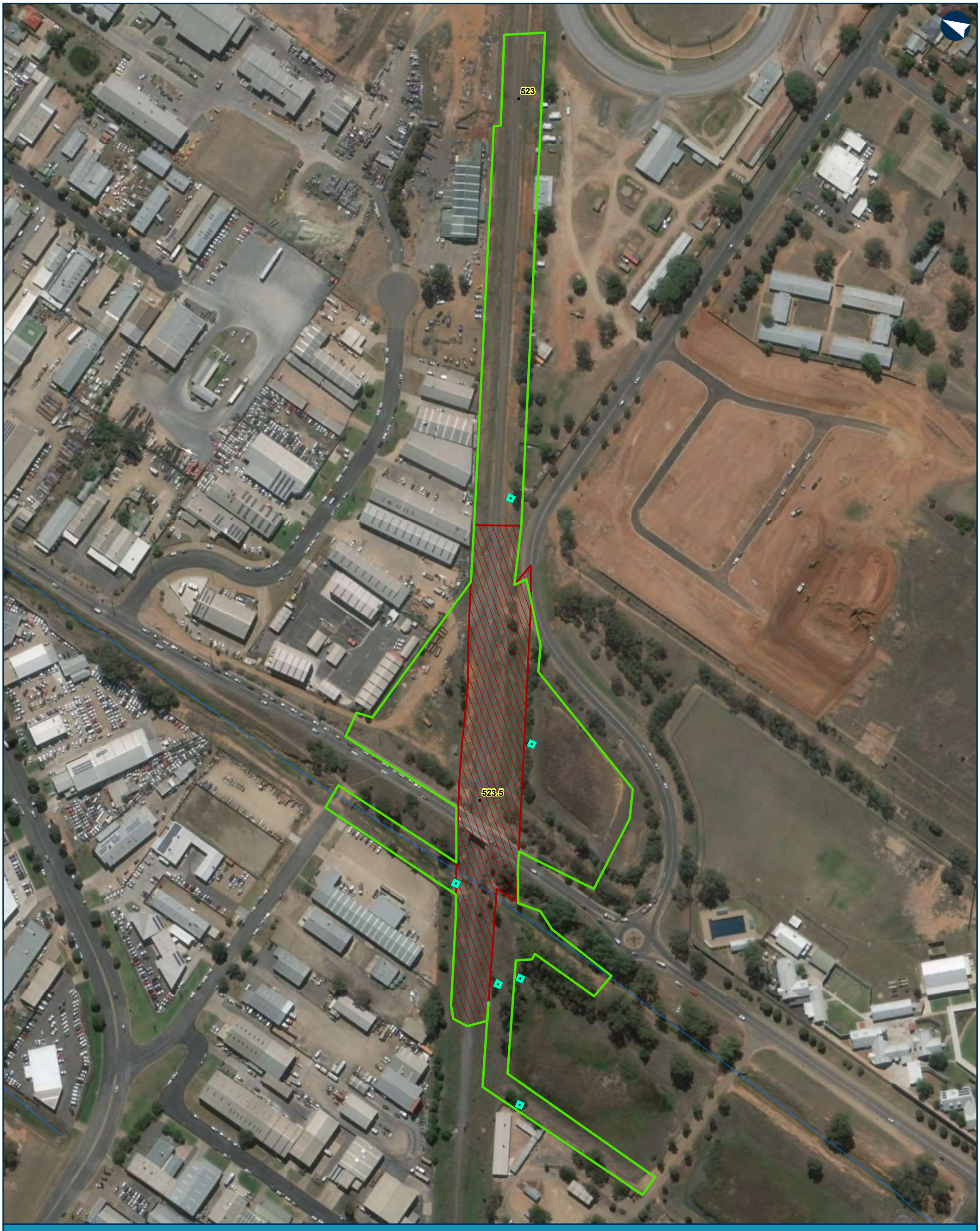


Albury to Illabo Figure 6 - Frog Habitat within A2I Proposal site MAP 6 OF 7

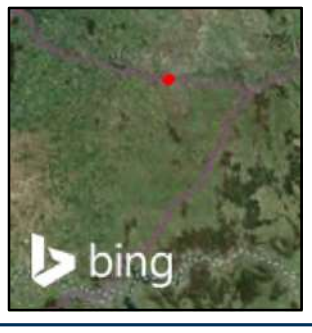
0 20 40 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 12/02/2020 Paper: A3
Author: ERM Scale: 1:2,520
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- Frog Habitat
- ARTC KM Posts
- Slew
- Enhancement Sites
- Previous Survey
- Drainage



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513.5

514

514.5

Albury to Illabo

Figure 6 - Frog Habitat within A2I Proposal site

MAP 7 OF 7

0 20 40 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Frog Habitat
- ARTC KM Posts
- Slew
- Previous Survey
- Drainage

Date: 12/02/2020 Paper: A3

Author: ERM Scale: 1:3,320

Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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4.6 Fauna Species Recorded

A total of 52 birds species, two (2) mammal species, zero (0) reptiles and three (3) amphibian species were recorded during the August 2019 Rapid Biodiversity Assessments. Fauna species were identified opportunistically throughout these assessments noting that no targeted surveys were undertaken.

4.6.1 Birds

A combined total of 52 bird species were identified during the August 2019 survey (Appendix A).

Birds were recorded in a variety habitats including, the railway corridor, dams, riparian corridors, woodlands, urban environments, gardens, non-native grasslands and shrublands. Two (2) cup shaped nests and 21 mud nests were identified within the A2I Proposal site.

Bird diversity was greatest within the very limited areas of woody vegetation and aquatic habitats. Adjacent areas of larger, more intact woodlands were also noted to contain a high diversities of birds which may utilise the resources present within the rail corridor occasionally as a small part of a large home range.

No EPBC listed Migratory species were identified during the field surveys. Eight (8) EPBC Marine listed species were identified during the field surveys. The A2I Proposal site is not located or likely to impact any Commonwealth Marine Protected Areas. Therefore, an impact assessment under the EPBC Act of these Marine Species is not required.

One (1) species of conservation significance was identified during the field surveys, which was the Superb Parrot (*Polytelis swainsonii*). A total of six (6) Superb Parrot individuals including both females and males were detected within and immediately adjacent to the A2I Proposal site. Five individuals were detected within 250m of the Harefield Track Slew Site and one (1) individual was detected in the Illabo to Junee Track Slew Site (Figure 7 and Figure 8).

Plate 7: Male Superb Parrot

Plate 8: Female Superb Parrot

Albury to Illabo

Figure 7 - Superb Parrot *(Polytelis swainsonii)* sightings at Harefield Track Slew Site

MAP 1 OF 1

0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- Superb Parrot Sighting
- ARTC KM Posts
- Track Slew
- Previous Survey
- Riverina SVM PCT (PCT ID)

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:4,580

Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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Albury to Illabo

Figure 8 - Superb Parrot *(Polytelis swainsonii)* sightings at Illabo to Junee Track Slew Site

MAP 1 OF 1

0 50 100 150 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:3,360
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- Superb Parrot Sighting
- ARTC KM Posts
- Track Slew
- Previous Survey
- Riverina SVM PCT (PCT ID)

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The majority of bird species identified during the field surveys were woodland species. Five (5) bird of prey species were identified during the surveys, which included the Collared Sparrowhawk (*Accipiter cirrocephalus*), Brown Goshawk (*Accipiter fasciatus*), Brown Falcon (*Falco berigora*), Nankeen Kestrel (*Falco cenchroides*) and Black Kite (*Milvus migrans*).

Nine (9) parrot species were detected during the surveys, which included the Sulphur-crested Cockatoo (*Cacatua galerita*), Galah (*Eolophus roseicapilla*), Eastern Bluebonnet (*Northiella haematogaster*), Cockatiel (*Nymphicus hollandicus*), Crimson Rosella (*Platycercus elegans*), Eastern Rosella (*Platycercus eximius*), Red-rumped Parrot (*Psephotus haematonotus*), Superb Parrot (*Polytelis swainsonii*) and Rainbow Lorikeet (*Trichoglossus moluccanus*).

Nine (9) wetland species were detected during the surveys, which included the Pacific Black Duck (*Anas superciliosa*), Australian Wood duck (*Chenonetta jubata*), White-faced Heron (*Egretta novaehollandiae*), Little Pied Cormorant (*Microcarbo melanoleucos*), Little Black Cormorant (*Phalacrocorax sulcirostris*), Purple Swamphen (*Porphyrio*), Australian White Ibis (*Threskiornis moluccus*) and Straw-necked Ibis (*Threskiornis spinicollis*).

4.6.2 Mammals

Two (2) mammal species were detected within the A2I Proposal site during the August 2019 field visit. The Eastern Grey Kangaroo (*Macropus giganteus*) and European Rabbit (*Oryctolagus cuniculus*) were observed on several occasions. In addition to these species, there was secondary evidence of other mammal species (identification not confirmed) within the A2I Proposal site and a network of European Rabbit (*Oryctolagus cuniculus*) burrows was found within Wagga Road Bridge - Enhancement Site 4.

4.6.3 Reptiles

Zero (0) reptiles were recorded during the August 2019 Rapid Biodiversity Assessments.

4.6.4 Amphibians

Three (3) amphibian species were recorded during the August 2019 Rapid Biodiversity Assessments. Amphibians included the Eastern sign-bearing Froglet (*Crinia parinsignifera*), Common Eastern Froglet (*Crinia signifera*) and the Spotted Marsh Frog (*Limnodynastes tasmaniensis*).

4.6.5 Introduced Fauna

Five (5) invasive fauna species were identified during the August 2019 Rapid Biodiversity Assessments. These included the Rock Dove (*Columba livia*), House Sparrow (*Passer domesticus*), Spotted Dove (*Spilopelia chinensis*), Common Starling (*Sturnus vulgaris*) and the European Rabbit (*Oryctolagus cuniculus*).

The Common Starling, House Sparrow and Rock Dove were identified at the majority of the A2I Proposal site and were among the most commonly sighted bird species. These three (3) species are likely compete with native species for resources and habitat.

4.7 Threatened Fauna Species

There are three (3) threatened species known to occur and nine (9) threatened species considered likely to occur within the A2I Proposal site.

There are 47 threatened species considered to have the potential to occur within the A2I Proposal site. The remaining 22 threatened species are considered to be unlikely to occur within the A2I Proposal site. Threatened and migratory species that are known or considered likely to occur within the A2I Proposal site are detailed in Table 12.

Table 12 Threatened and Migratory species known or likely to occur within the A2I Proposal site

Scientific Name	Common Name	BC Act	EPBC Act	Likelihood of Occurrence	Habitat within A2I Proposal site	Vulnerability to Impact
Polytelis swainsonii	Superb Parrot	V	V	Known	Several Superb Parrot individuals were observed within the A2I Proposal site on two (2) occasions. The individuals were all recorded in non-remnant vegetation patches with sporadic *Eucalyptus albens* individuals. Although, the A2I Proposal site is predominately cleared and absent of woody vegetation, there are many areas that contain intermittent *Eucalyptus* individuals (e.g. *E. camaldulensis, E. melliodora* and *E. blakeyi*) with a grassy understory provide suitable foraging habitat for Superb Parrots. This species is known to inhabit White Box-Yellow Box-Blakely's Red Gum Grassy Woodlands, which was present at several locations within the A2I Proposal site.	Habitat loss Loss of hollow bearing trees Impacts on local populations Increased habitat fragmentation Wildlife strike Construction and operational noise, light and vibration impacts
Crinia sloanei	Sloane's Froglet	V	E	Likely	The field surveys identified numerous areas within the A2I Proposal site that would provide suitable and preferred habitat for this species. Along the railway corridor many grassland areas of low gradient will be periodically subject to inundation, which would be preferable habitat for this species. The A2I Proposal site contained several semi-permanent and permanent water sources, which could be utilised during times of drought for this species.	Habitat loss Changes to hydrology through run off, sedimentation and erosion Use of chemicals and herbicides. Increased edge effects (specifically spread of weeds and pathogens)
Apus pacificus	Fork-tailed Swift	-	Mi	Likely	The Fork-tailed Swift is known to inhabit a broad range of habitat types whilst in Australia, many of which are represented within the A2I Proposal site (e.g. dry open habitats, low scrub, treeless grassland, open farmland, urban areas, open forest). The A2I Proposal site would also likely be capable of supporting a reliable food source (insects) for this species.	Impacts on local populations Wildlife strike

Scientific Name	Common Name	BC Act	EPBC Act	Likelihood of Occurrence	Habitat within A2I Proposal site	Vulnerability to Impact
Glossopsitta pusilla	Little Lorikeet	V	-	Likely	The Little Lorikeet primarily inhabits the canopy of open *Eucalyptus* woodlands and forests, which is present in a few isolated patches throughout the A2I Proposal site. The species is known to utilise isolated flowering trees in open country (e.g. paddocks, roadside remnants and urban areas). The A2I Proposal site contains an abundance of isolated flowering trees. A range of other lorikeet and parrot species were regularly identified utilising isolated flowering *Eucalyptus* trees throughout the A2I Proposal site.	Habitat loss Loss of hollow bearing trees Increased habitat fragmentation Wildlife strike Construction and operational noise, light and vibration impacts
Hirundapus caudacutus	White-throated Needletail	-	V, Mi	Likely	The White-throated Needletail is known to inhabit a broad range of habitat types whilst in Australia, many of which are represented within the A2I Proposal site (e.g. woodlands, farmlands, grasslands, edges of vegetation, cleared areas). The A2I Proposal site could support a reliable food source (insects) for this species.	Habitat loss Increased habitat fragmentation Wildlife strike
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	-	Likely	The Major Mitchell's Cockatoo would be able to intermittently utilise the majority of treeless habitat areas within the A2I Proposal site as it provides some food sources and is close proximity to permanent water sources (e.g. rivers, streams, dams, wetlands). The areas containing a greater abundance of woody vegetation would provide a greater food source variety for this species and would be preferred.	Habitat loss Loss of hollow bearing trees Increased habitat fragmentation Wildlife strike
Neophema pulchella	Turquoise Parrot	V	-	Likely	The Turquoise Parrot utilises the edges of *Eucalyptus* woodland habitats adjoined to clearings (e.g. farmland, watercourses, timbered ridges). A lot of the A2I Proposal site is cleared areas with some adjacent to *Eucalyptus* woodlands. The A2I Proposal site also contains grasslands adjacent to these *Eucalyptus* woodlands suitable for foraging. During the field visits a range of parrot species were regularly observed in these clearings foraging.	Habitat loss Loss of hollow bearing trees Increased habitat fragmentation Wildlife strike

Scientific Name	Common Name	BC Act	EPBC Act	Likelihood of Occurrence	Habitat within A2I Proposal site	Vulnerability to Impact
Stagonopleura guttata	Diamond Firetail	V	-	Likely	The Diamond Firetails is predominately found in grassy *Eucalyptus* woodlands, particularly Box-Gum Woodlands, which are present in a few locations within the A2I Proposal site. This species is found in riparian areas and lightly wooded farmland, which is present and in close proximity to a lot of the A2I Proposal site. Additionally, the A2I Proposal site contains large grassy expanses, which could act as reliable food source (grass seeds, insects) for this species.	Habitat loss Increased habitat fragmentation Wildlife strike
Leucochrysum albicans var. tricolor	Hoary Sunray	-	E	Likely	The Hoary Sunray is known to inhabit several habitat types (e.g. grasslands, woodland, modified habitats, semi-urban areas, roadsides) that are present throughout the A2I Proposal site. The majority of the A2I Proposal site is subject to anthropogenic disturbances and this species is known to respond positively to disturbed areas.	Habitat loss Increased edge effects (specifically spread of weeds and pathogens)
Petaurus norfolcensis	Squirrel Glider	V and E[2]	-	Known	The Squirrel Glider has been identified within the locality of the A2I Proposal site over 900 times forms part of the endangered population (Wagga Wagga Local Government Area - endangered population listing under BC Act). The species can utilise *Eucalyptus* woodlands that are present in a few areas within the A2I Proposal site. The existing Kapooka Squirrel Glider Crossing (Chainage 527.500 km; Olympic Highway Overbridge) that intercepts the A2I Proposal site is under the 7.1m clearance there would likely be a requirement to relocate the glider crossing. This will require consultation and agreement with the relevant road authority.	Loss of hollow bearing trees Impacts on local populations Increased habitat fragmentation Wildlife strike Construction and operational noise, light and vibration impacts

[2] The Wagga Wagga Squirrel Glider (P*etaurus norfolcensisl)* population is considered Endangered in accordance with the BC Act.

Scientific Name	Common Name	BC Act	EPBC Act	Likelihood of Occurrence	Habitat within A2I Proposal site	Vulnerability to Impact
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Likely	The Grey-headed Flying-fox utilises a broad range of habitat types and many are present within the A2I Proposal site (e.g. woodlands, swamps, urban gardens). It is likely that this species would feed on flowering *Eucalyptus* and *Melaleuca* individuals within the A2I Proposal site.	Impacts on local populations Increased habitat fragmentation Wildlife strike Construction and operational noise, light and vibration impacts
Pomatostomus temporalis	Grey-crowned Babbler (eastern subspecies)	V	-	Known	This species has been previously recorded within the rail corridor at Kapooka within characteristic nests occurring within 100m of the Proposal site (pers. comm. David Sharpe).	Impacts on local populations Increased habitat fragmentation Wildlife strike Construction and operational noise, light and vibration impacts on breeding populations

5. CONSIDERATION OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE (MNES)

Based on the results of the desktop assessment and the field survey, a preliminary assessment of Matters of National Environmental Significance (MNES) within the A2I Proposal site has been provided in Table 13.

Table 13 MNES within the A2I Proposal site (known and likely)

MNES	Relevance to the A2I Proposal site
World heritage properties	There are no world heritage properties within the A2I Proposal site.
National heritage properties	There are no national heritage properties within the A2I Proposal site.
Wetlands of international importance	There are no wetlands of international importance associated with the A2I Proposal site.
Threatened species and ecological communities	Threatened Species (Known): ■ Superb Parrot (*Polytelis swainsonii*); Threatened Species (Likely): ■ Sloane's Froglet (*Crinia sloanei*); ■ White-throated Needletail (*Hirundapus caudacutus*); ■ Hoary Sunray (*Leucochrysum albicans var. tricolor*); and ■ Grey-headed Flying-fox (*Pteropus poliocephalus*). *Note: None of the vegetation communities recorded within the A2I Proposal site are consistent with any of the EPBC listed TEC due the highly disturbed groundcover (<50% native).*
Migratory species	Likely: ■ Fork-tailed Swift (*Apus pacificus*); and ■ White-throated Needletail (*Hirundapus caudacutus*).
Commonwealth marine area	There are no Commonwealth marine areas within the A2I Proposal site
The Great Barrier Reef Marine Park	N/A to this Proposal
Nuclear actions	N/A to this Proposal.
Water resources	N/A to this Proposal.

Under the EPBC Act a referral is required to the Australian Government Department of the Environment and Energy (DoEE) for projects, or 'actions', that are likely to have a significant impact on a MNES or the environment on Commonwealth land. The Australian Government Minister for the Environment determines whether or not the Proposal will need formal assessment and approval under the EPBC Act. If so, that Proposal is a controlled action under the EPBC Act.

The findings of preliminary environmental investigations carried out to date have confirmed the presence of threatened species listed under the EPBC Act in the A2I Proposal site. Therefore, the proposal is being referred to the Australian Government Minister for the Environment and Energy through the preparation of a separate referral. The Proposal is not considered likely to affect MNES or environment on Commonwealth land. Whilst it is considered unlikely the SSI Proposal is a Controlled Action, a referral is being made in any event, to confirm that formal EPBC Act assessment and approval is not required.

6. IMPACT ASSESSMENT

While the risk of significant impacts is considered unlikely, the potential impact of the Proposal on threatened species and communities listed under the BC Act and the EPBC Act will need to be considered as part of the EIS in accordance with the EP&A Act.

Given that significant impact on threatened species is unlikely within the already highly disturbed operational alignment, ARTC will to seek a determination (BDAR waiver) from the Secretary under section 7.9(2) of the BC Act:

> *"Any such application [SSI] is to be accompanied by a biodiversity development assessment report unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values."*

If such a determination is made, the impacts to threatened species will still need to be considered in the EIS, but not in the form of a BDAR. In addition, Section. 7.14 of the BC Act, would not apply.

Noting there is already an existing impact associated with the existing rail line, the focus of the impact assessment is on any additional impacts associated with the Proposal. Species will be selected for further assessment by considering how they and their habitat might be affected by the Proposal. In this instance the main potential impacts of the Proposal during construction and operation that will need to be assessed include:

- 0.45 ha of BC Act listed White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) mapped at Wagga Road - Enhancement Site 4 will be avoided during detailed design. This area must be clearly delineated in the field and on all construction drawings as a no go zone. Further management and mitigation measures will be detailed in the EIS;
- Clearance of <0.5 ha of isolated and regrowth woodland trees;
- Loss of some, albeit limited fauna habitat and impacts on local populations of threatened species, particularly the Superb Parrot which was confirmed on site during the field surveys;
- Disturbance to natural and constructed aquatic habitats. Any waterway crossings will need to consider an appropriately designed structure that does not obstruct fish passage and will be designed in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management and the Policy and Guidelines for Fish Friendly Waterway Crossings;
- Increased habitat fragmentation; and
- Increased potential for wildlife to be struck by the potential higher frequency of trains and use of double deck rolling stock. The squirrel glider in particular will require detailed assessment and mitigation. The design of any recommended glider poles must consider:
  - potential habitat within the locality to identify 'hot spots' for installation of crossings; and
  - gliding ability to determine the required pole height and distance between poles, allowing for clearance of double-stacked containers.

Potential indirect impacts may result from the Proposal and include:

- Changes to hydrology through run off, sedimentation and erosion from construction works;
- Impacts to Groundwater Dependant Ecosystems. The assignment of an ecological value to GDEs allows management needs to be prioritised. To assign a value to individual GDEs, NSW DPIE has adopted the high ecological value aquatic ecosystem (HEVAE) framework that may be considered within the EIS;
- Soil or water contamination from construction incidents/spills;
- Construction and operational noise, light and vibration impacts; and

- Increased edge effects (specifically spread of weeds) and any inadvertent impacts on adjacent habitat or vegetation.

Given the high levels of disturbance within the A2I Proposal site, there is also the risk that weeds may be transported off-site. Mitigation measures to reduce the chance of weed spread should be considered within the EIS.

7. RECOMMENDATIONS

Field surveys were undertaken over four (4) days from the 26th of August 2019 to the 29st of August 2019 by two ERM ecologists. The primary focus of the field surveys was to undertake a rapid assessment and to identify areas and matters of significant biodiversity value within the A2I Proposal site.

Following the field survey, the Superb Parrot was the only Matter of National Environmental Significance identified within the A2I Proposal site. In addition to this, the Superb Parrot and White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) TEC were the two (2) Matters of State Environment significance confirmed within the A2I Proposal site.

The Superb Parrot was identified at two locations within and immediately adjacent to the A2I Proposal site. On both occasions, the Superb Parrots were foraging in habitat within or adjacent to the A2I Proposal site. In addition to the Superb Parrot, both the Squirrel Glider and Grey-crowned Babbler have been previously recorded within the rail corridor and the following species are considered 'likely' to occur within the A2I Proposal site based on their habitat preferences. All of these species will need to be addressed in detail within the EIS:

- Sloane's Froglet;
- Fork-tailed Swift;
- Little Lorikeet;
- White-throated Needletail;
- Major Mitchell's Cockatoo;
- Turquoise Parrot; and
- Diamond Firetail;
- Hoary Sunray;
- Grey-headed Flying-fox.

Based on the investigations undertaken to date, the following recommendations are provided for additional survey(s) to provide further detail on biodiversity features/values and to inform the EIS.

- Avoid areas of TEC where possible during detailed design;
- To better understand the use of the A2I Proposal site by Superb Parrots, Squirrel Glider and Grey-crowned Babbler, additional surveys and detailed habitat assessments (including mapping of key habitat resources) is recommended;
- Undertake a detailed habitat assessment and fauna survey, which includes targeted survey methods for species considered likely to occur. These may need to consider the requirements of the BAM (unless a BDAR Waiver is approved, refer to Section 6), as well as other guidance documents including; but not limited to:
  - The 'Species credit' threatened bats and their habitats - NSW survey guide for the Biodiversity Assessment Method (https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/species-credit-threatened-bats-survey-guide-180466.pdf);
  - Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act (https://www.environment.gov.au/resource/survey-guidelines-australias-threatened-bats-guidelines-detecting-bats-listed-threatened);
  - Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (https://www.environment.gov.au/epbc/publications/survey-guidelines-australias-threatened-birds-guidelines-detecting-birds-listed-threatened);
  - Survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the EPBC Act (https://www.environment.gov.au/resource/survey-guidelines-australias-threatened-frogs-guidelines-detecting-frogs-listed-threatened);
  - Survey guidelines for Australia's threatened fish: Guidelines for detecting fish listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999; and

- Lintermans (2014) Finding the needle in the haystack: comparing sampling methods for detecting an endangered freshwater fish.

- Survey the A2I Proposal site for bat roosts and roost zones. This would be limited to the bridges within the enhancement sites as well as hollow bearing trees to be removed;
- Undertake targeted amphibian searches within the areas of suitable habitat;
- Undertake detailed floristic surveys within the small areas (<1 ha total) of native vegetation (woodland remnants); and
- Undertake targeted flora survey in areas of potential habitat in accordance with the NSW Guide to Surveying Threatened Plants (https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/guide-surveying-threatened-plants-160129.pdf).

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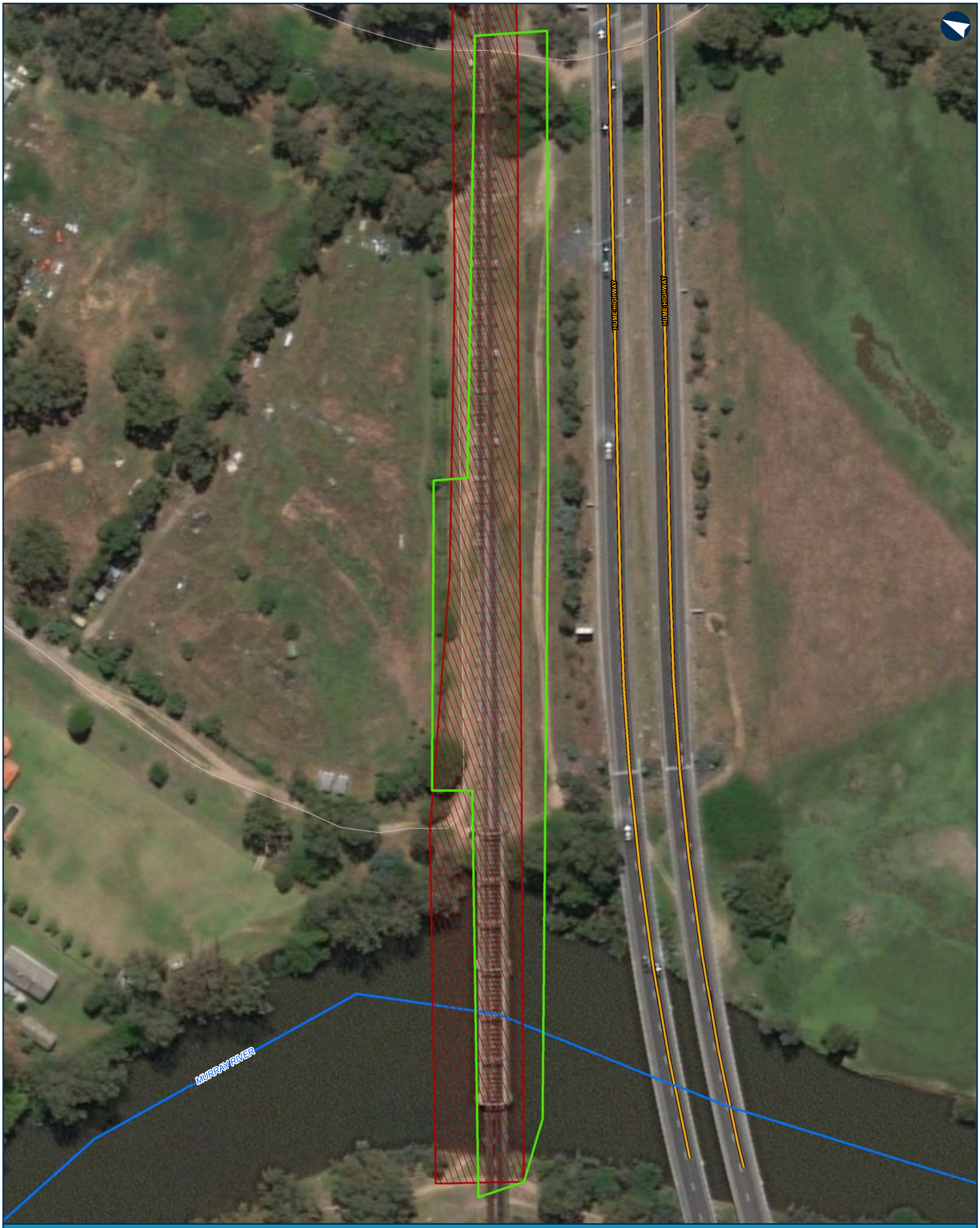
APPENDIX A PROPOSAL SITE FIGURES



Albury to Illabo | 1. A2I Study Area - Murray River Bridge Precinct (Enhancement Site 1) | MAP 1 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:1,260
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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Albury to Illabo | 2. A2I Study Area - Albury Station Precinct (Enhancement Sites 2 and 3) | MAP 2 OF 21

0 20 40 60
m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:5,590
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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Albury to Illabo | 3. A2I Study Area - Wagga Road Bridge (Enhancement Site 4) | MAP 3 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:1,850
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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Albury to Illabo

4. A2I Study Area - Trackside Structures at chainage 632.86

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:1,870
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Trackside Structures
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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596.5

Albury to Illabo | 5. A2I Study Area - Culcairn Footbridge (Enhancement Site 5) | MAP 5 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:2,700
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Trackside Structures
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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Albury to Illabo

6. A2I Study Area - Henty Track Slew

MAP 6 OF 21

0 20 40 60
m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Trackside Structures
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:3,880
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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564.5

565

565.5

OLYMPIC HIGHWAY

COX STREET

COLE STREET

PLUNKETT STREET

SANDY CREEK

Albury to Illabo

7. A2I Study Area - Yerong Creek Track Slew

MAP 7 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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ARTC

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Date: 10/02/2020 Paper: A3

Author: ERM Scale: 1:3,930

Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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Albury to Illabo | 8. A2I Study Area - Trackside Structures near The Rock | MAP 8 OF 21

0 20 40 60
m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Trackside Structures
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:5,820
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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URANQUINTY CROSS ROAD
YARRAGUNDRY STREET
OLYMPIC HIGHWAY
535
535.5
MORGAN STREET
RYAN STREET
KEY STREET
536
SANDY CREEK
536.5
537
OLYMPIC HIGHWAY
SANDY CREEK

Albury to Illabo

9. A2I Study Area - Uranquinty Track Slew

MAP 9 OF 21

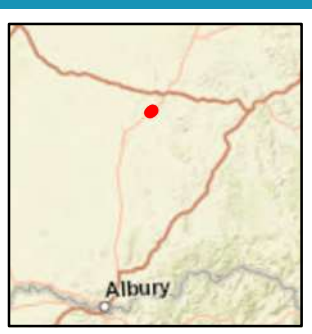
0 20 40 60
m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:6,060
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Trackside Structures
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse



INLAND RAIL
ARTC

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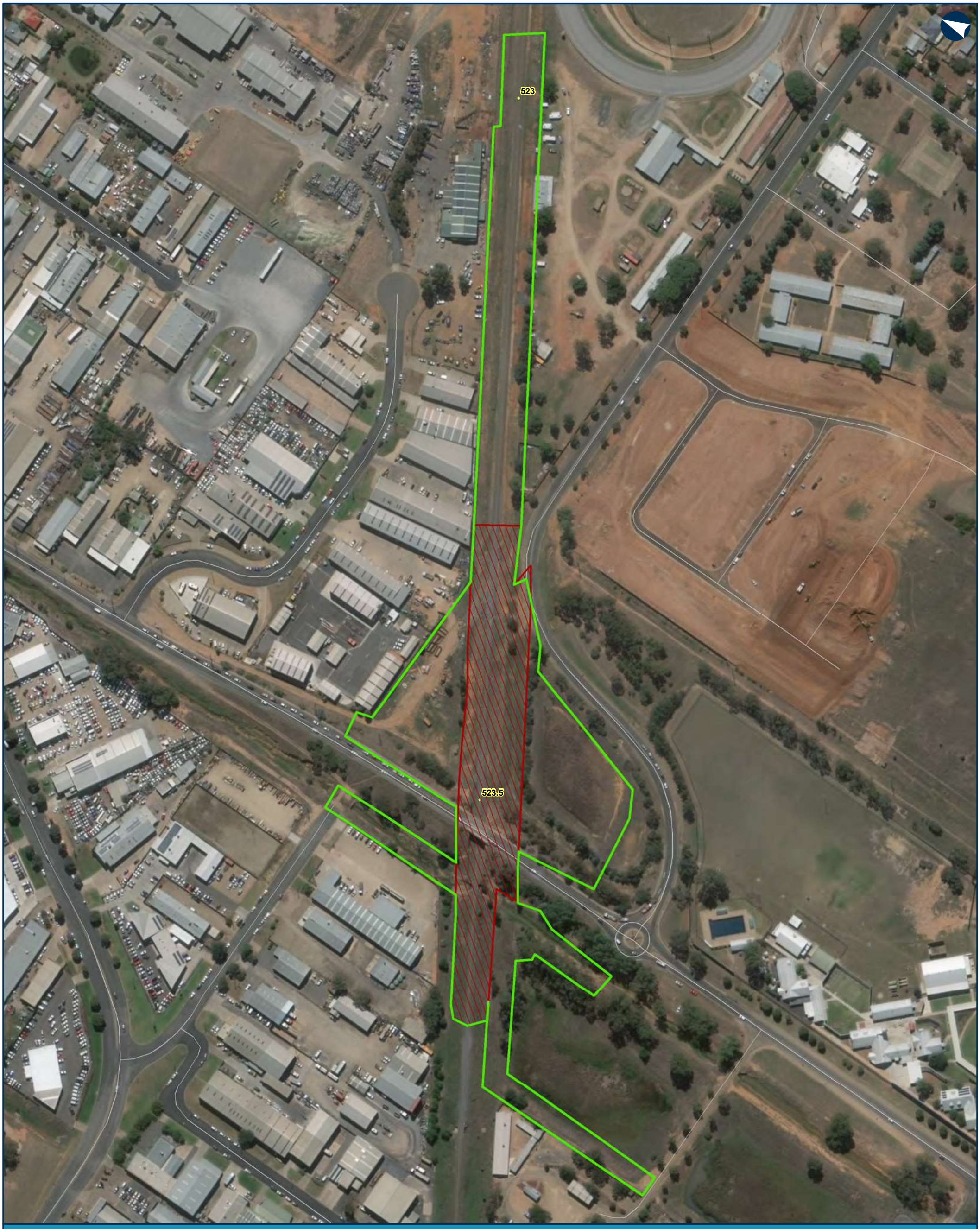

Albury to Illabo | 10. A2I Study Area - Pearson Street Bridge (Enhancement Site 6) | MAP 10 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:2,520
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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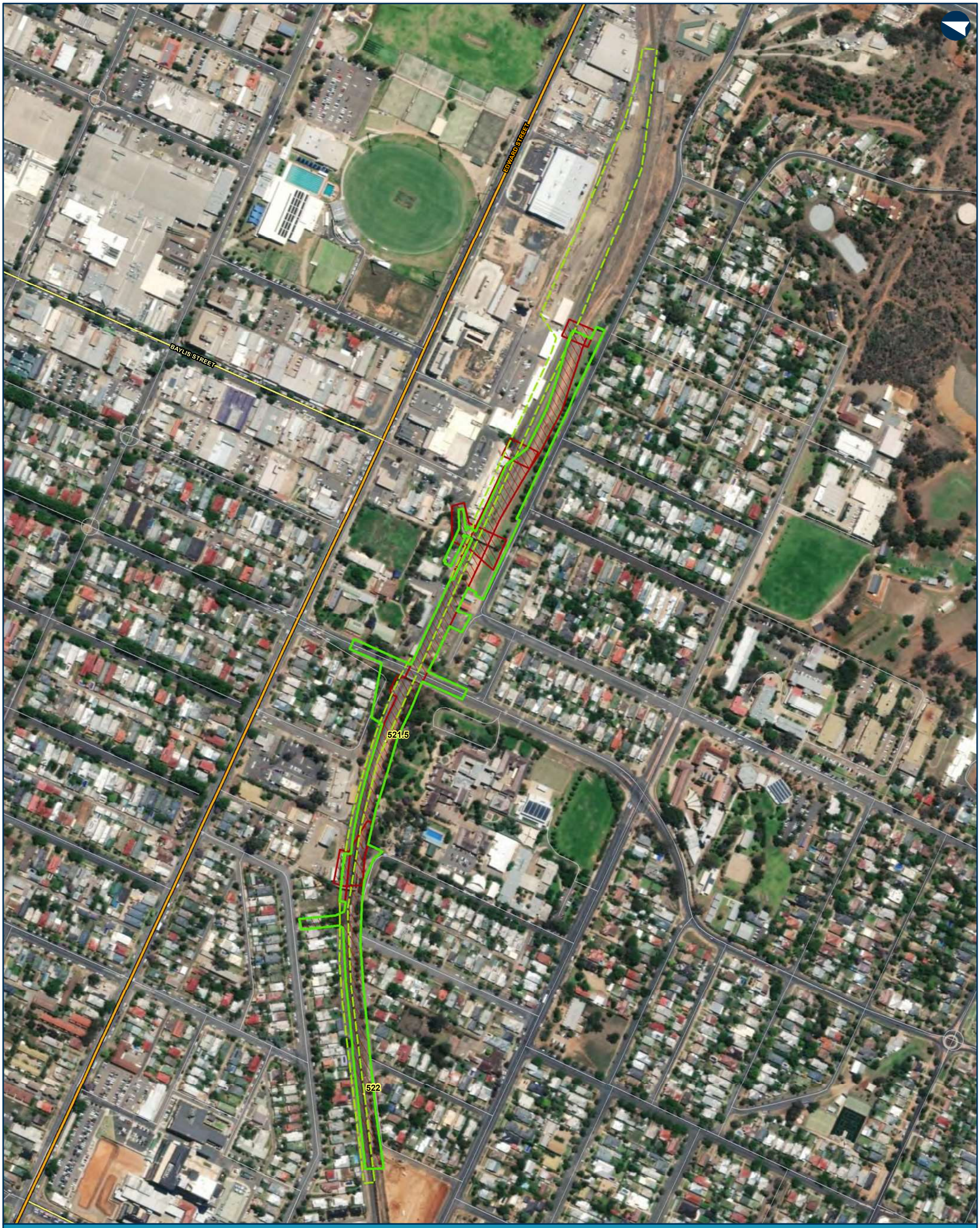

Albury to Illabo 11. A2I Study Area - Wagga Wagga Station Precinct (Enhancement Sites 7, 8 and 9) MAP 11 OF 21

0 20 40 60
m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:4,840
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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513.5

BYRNES ROAD

514

514.5

Albury to Illabo

12. A2I Study Area - Bomen Track Slew

MAP 12 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:3,320
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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REEDY CREEK

BUCKS CREEK

498

498.5

BYRNES ROAD

Albury to Illabo

13. A2I Study Area - Harefield Track Slew

MAP 13 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:3,070
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Trackside Structures
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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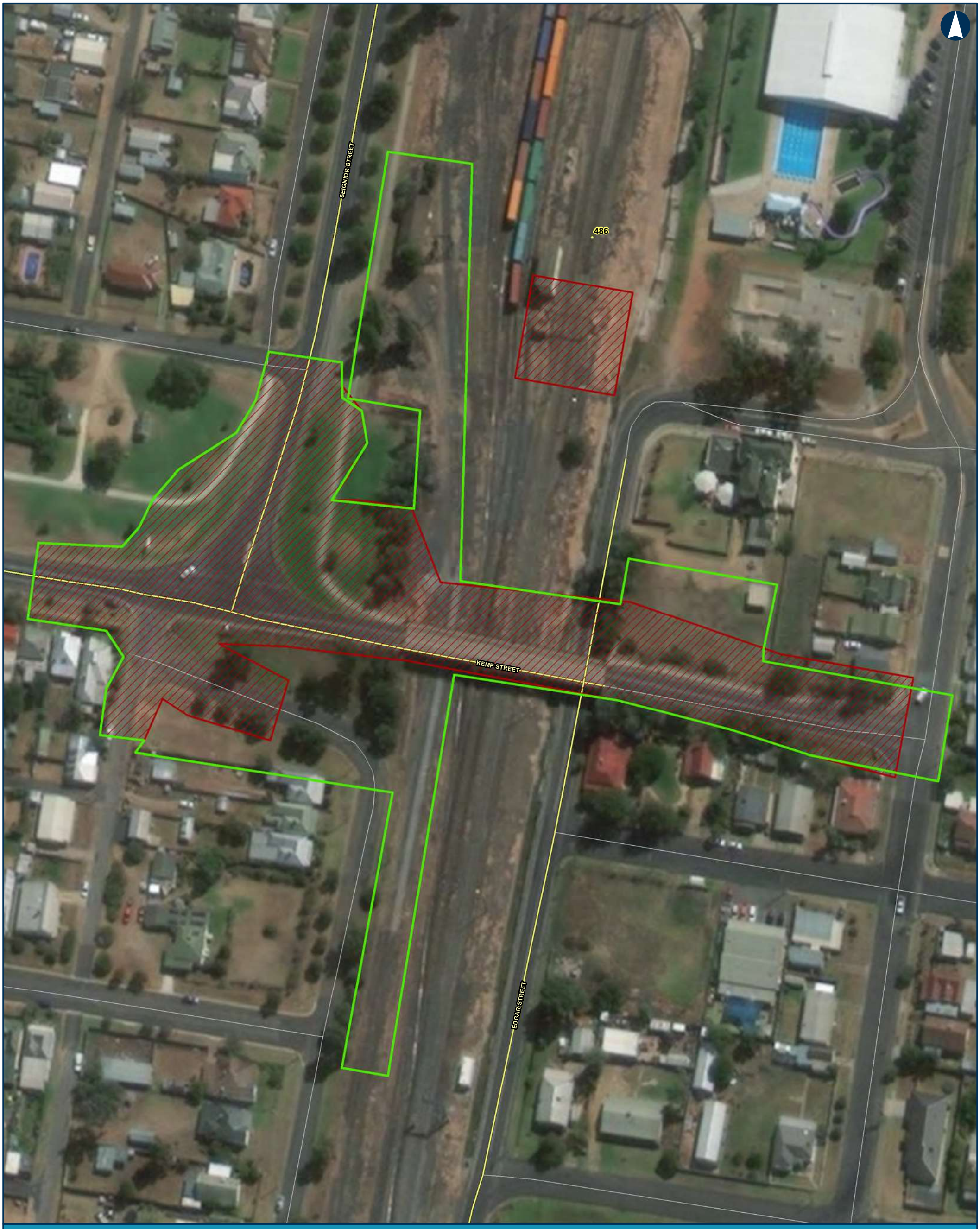

Albury to Illabo 14. A2I Study Area - Kemp Street Bridge (Enhancement Site 10) MAP 14 OF 21

0 20 40 60 m

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:1,110
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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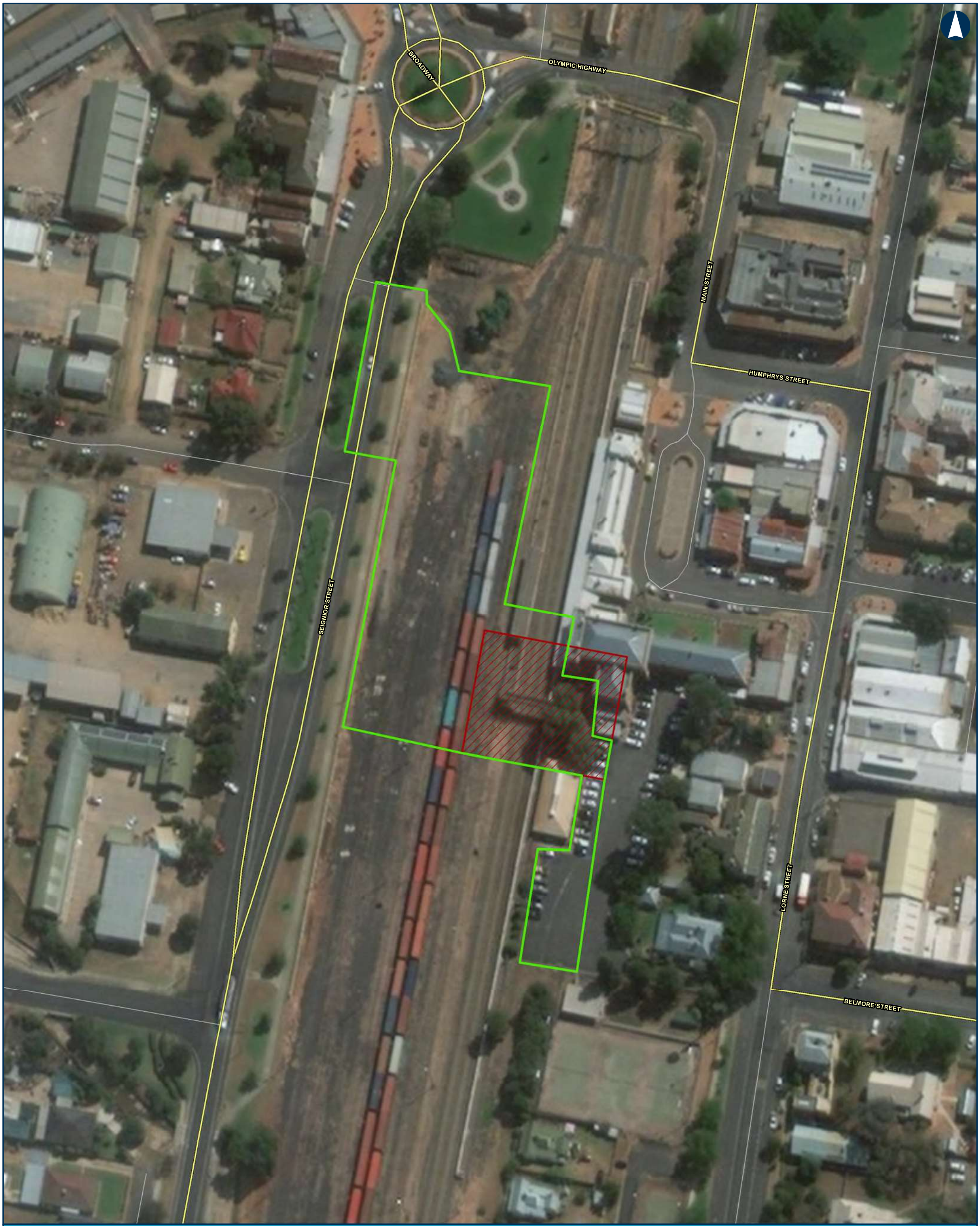


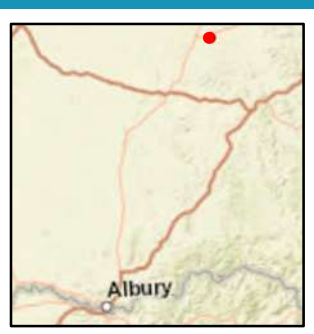
Albury to Illabo 15. A2I Study Area - Junee Station Precinct (Enhancement Sites 11 and 12) MAP 15 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Enhancement Sites
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse



Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:1,160
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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Albury to Illabo 16. A2I Study Area - Junee Track Slew MAP 16 OF 21

0 20 40 60 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:4,870
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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Albury to Illabo 17. A2I Study Area - Illabo to Junee Track Slew MAP 17 OF 21

0 200 400 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:14,880
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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Albury to Illabo | 18. A2I Study Area - Illabo to Junee Track Slew | MAP 18 OF 21

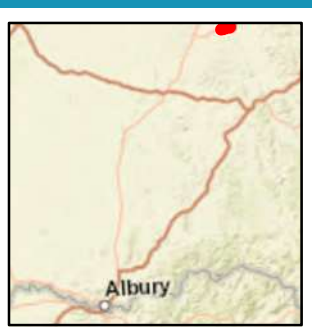
0 240 480 960 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:17,950
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse



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Albury to Illabo

19. A2I Study Area - Illabo to Junee Track Slew

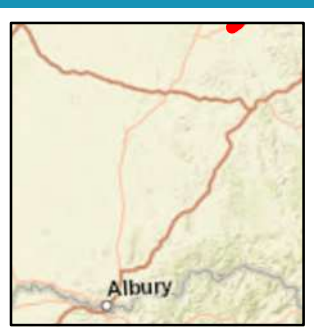
MAP 19 OF 21

0 200 400 m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse



Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:14,290
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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Albury to Illabo | 20. A2I Study Area - Illabo to Junee Track Slew | MAP 20 OF 21

0 2 4 6 8 10 m

Coordinate System: GDA 1994 MGA Zone 55

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:11,470
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

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Albury to Illabo | 21. A2I Study Area - Trackside Structures at chainage 531.256 | MAP 21 OF 21

0 20 40 60
m

Coordinate System: GDA 1994 MGA Zone 55

LEGEND

- ARTC KM Posts
- Track Slew Site
- Previous Survey
- Power Crossing
- Primary Road/Motorway
- Major Road
- Minor Road
- Watercourse

INLAND RAIL | ARTC

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

Date: 10/02/2020 Paper: A3
Author: ERM Scale: 1:5,200
Data Sources: DCDB - NSW Gov; ESRI World Imagery; Inset : Bing

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APPENDIX B FAUNA SPECIES OBSERVED DURING FIELD SURVEYS, AUGUST 2019

Scientific name	Common name	EPBC Act	BC Act
Birds			
Acanthiza chrysorrhoa	Yellow Rumped Thornbill	-	-
Accipiter cirrocephalus	Collared Sparrowhawk	-	-
Accipiter fasciatus	Brown Goshawk	Ma	-
Anas superciliosa	Pacific Black Duck	-	-
Anthochaera carunculata	Red Wattle Bird	-	-
Cacatua galerita	Sulphur-crested Cockatoo	-	-
Chenonetta jubata	Australian Wood Duck	-	-
Cisticola exilis	Golden Headed Cistocola	-	-
Colluricincla harmonica	Grey Shrike Thrush	-	-
*Columba livia**	Rock Dove	-	-
Corcorax melanorhamphos	White-winged Chough	-	-
Cormobates leucophaea	White-throated Tree Creeper	-	-
Corvus coronoides	Australian Raven	-	-
Corvus mellori	Little Raven	Ma	-
Cracticus tibicen	Australian Magpie	-	-
Cracticus torquatus	Grey Butcherbird	-	-
Dacelo novaeguineae	Laughing Kookaburra	-	-
Egretta novaehollandiae	White-faced Heron	-	-
Entomyzon cyanotis	Blue-faced Honeyeater	-	-
Eolophus roseicapilla	Galah	-	-
Falco berigora	Brown Falcon	-	-
Falco cenchroides	Nankeen Kestrel	Ma	-
Fulica atra	Eurasian Coot	-	-
Geopelia placida	Peaceful Dove	-	-
Grallina cyanoleuca	Magpie lark	-	-
Hirundo neoxena	Welcome Swallow	Ma	-
Lichenostomus fuscus	Fuscous Honeyeater	-	-
Malurus cyaneus	Superb Fairy Wren	-	-
Manorina melanocephala	Noisy Miner	-	-
Microcarbo melanoleucos	Little Pied Cormorant	-	-
Milvus migrans	Black Kite	-	-
Northiella haematogaster	Eastern Bluebonnet	-	-
Nymphicus hollandicus	Cockatiel	-	-

Scientific name	Common name	EPBC Act	BC Act
Ocyphaps lophotes	Crested Pigeon	-	-
*Passer domesticus**	House Sparrow	-	-
Petrochelidon ariel	Fairy Martin	-	-
Petrochelidon nigricans	Tree Martin	Ma	
Phalacrocorax sulcirostris	Little Black Cormorant	-	-
Platycercus elegans	Crimson Rosella	-	-
Platycercus eximius	Eastern Rosella	-	-
Polytelis swainsonii	Superb Parrot	V	V
Porphyrio	Purple Swamphen	Ma	-
Psephotus haematonotus	Red-rumped Parrot	-	-
Rhipidura albiscapa	Grey Fantail	-	-
Rhipidura leucophrys	Willie Wag Tail	-	-
*Spilopelia chinensis**	Spotted Dove	-	-
Strepera graculina	Pied Currawong	-	-
Struthidea cinerea	Apostlebird	-	-
*Sturnus vulgaris**	Common Starling	-	-
Threskiornis moluccus	Australian White Ibis	Ma	-
Threskiornis spinicollis	Straw-necked Ibis	Ma	-
Trichoglossus moluccanus	Rainbow Lorikeet	-	-
Amphibians			
Crinia parinsignifera	Eastern sign-bearing Froglet	-	-
Crinia signifera	Common Eastern Froglet	-	-
Limnodynastes tasmaniensis	Spotted Marsh Frog	-	-
Mammals			
*Oryctolagus cuniculus**	European Rabbit	-	-
Macropus giganteus	Eastern Grey Kangaroo	-	-

CE = Critically Endangered; E = Endangered; V = Vulnerable; Mi = Migratory; Ma = Marine - = not listed, * = introduced species.

APPENDIX C FLORA SPECIES OBSERVED DURING FIELD SURVEYS, AUGUST 2019

Scientific name	Common name	EPBC Act	BC Act
*Salix nigra**	Black Willow	-	-
*Ligustrum lucidum**	Broad-leaved Privet	-	-
*Cirsium vulgare**	Spear Thistle	-	-
Rumex brownii	Hooded Dock	-	-
*Solanum mauritianum**	Wild Tobacco	-	-
Eucalyptus camaldulensis	River Red Gum	-	-
Acacia dealbata	Silver Wattle	-	-
Acacia saligna	Coojong	-	-
Eucalyptus blakelyi	Blakely's Red Gum	-	-
Acacia deanei	Deane's Wattle	-	-
Eucalyptus bridgesiana	Apple Box	-	-
Eucalyptus albens	White Box	-	-
Casuarina cunninghamiana	River Oak	-	-
Grevillea sp.	-	-	-
Typha orientalis	Bulrush	-	-
Eucalyptus melliodora	Yellow Box	-	-
Acacia sp.	-	-	-
*Lycium ferocissimum**	African boxthorn	-	-
Eucalyptus leucoxylon	Yellow Gum	-	-
Bursaria spinosa	Native Blackthorn	-	-
Melaleuca armillaris	Bracelet Honey-myrtle	-	-
Brachychiton populneus	Kurrajong	-	-
Grevillea robusta	Southern Silky Oak	-	-
Melaleuca styphelioides	Prickly-leaved Paperbark	-	-
Callistemon sp.	-	-	-
Eucalyptus sideroxylon	Mugga	-	-
Allocasuarina torulosa	Rose She-oak	-	-
Melaleuca sp.		-	-
*Osteospermum sp.**	African daisy	-	-
*Asparagus aethiopicus**	Climbing asparagus	-	-
Melaleuca decora	White Feather Honeymyrtle	-	-
Melaleuca salicina	White Bottlebrush	-	-
Acacia verniciflua	Varnish Wattle	-	-
Eucalyptus pulverulenta	Silver-leaved Mountain Gum	-	-

Scientific name	Common name	EPBC Act	BC Act
Callitris sp.	-	-	-
Dianella sp.	-	-	-
Corymbia maculata	Spotted Gum	-	-
Ligustrum sinense	Small Leaved Privet	-	-

CE = Critically Endangered; E = Endangered; V = Vulnerable; Mi = Migratory; Ma = Marine - = not listed, * = introduced species.

APPENDIX D RAPID WOODLAND HABITAT ASSESSMENT

Table D1 Rapid Woodland and Forest Habitat Assessment Results

Assessment	1	2	3	4	5	6
Waypoint	2	3	12	16	29	37
Site Description	Enhancement Site 1 (Murray River)	Enhancement Site 1 (Oddies Creek)	Enhancement Site 4	Enhancement Site 4 (north)	Enhancement Site 6	Enhancement Site 6 (wetland)
Date	26/08/2019	26/08/2019	26/08/2019	26/08/2019	26/08/2019	26/08/2019
Surveyor	Sebastian + Tom	Sebastian + Tom	Sebastian + Tom	Sebastian + Tom	Sebastian + Tom	Sebastian + Tom
Connectivity (internal)	3	3	2	4	3	2
Connectivity (external)	4	5	4	4	4	4
Bare soil (%)	3	1	1	1	1	2
Litter (%)	3	1	2	2	4	2
Rock (%)	1	1	1	1	1	1
Herbs (%)	1	3	1	2	1	1
Grass (%)	1	2	3	5	2	3
Shrubs (%)	2	3	1	1	2	2
Mid storey trees (%)	2	2	2	2	2	3
Upper trees (%)	2	2	4	2	3	2
Logs (%)	1	2	2	1	1	1
Classification	Riparian Woodland	Riparian Woodland	Open Woodland	Semi-cleared woodland	Semi-cleared woodland	Open woodland
Successional Stage	Predominately mixed regrowth and old individuals	Predominately mixed regrowth and old individuals	Predominately mixed regrowth and old individuals	Predominately mixed regrowth and old individuals	Predominately mixed regrowth and old individuals	Predominately old individuals
Hollow present	1	1	1	2	1	1
Water Sources	2	3	4	4	1	1

Assessment	1	2	3	4	5	6
Weeds (herbaceous)	5	5	2	2	3	2
Weeds (woody)	5	5	1	1	3	3
Other disturbances	Littering, noise/ vibration pollution, fragmentation, weeds	Littering, noise/ vibration pollution, fragmentation, weeds	Fenced, Fragmented	Cleared patches, dirt track through woodland	Poisoning of Eucalyptus individuals, dirt tracks, litter	Fencing, historic earthworks (filling)
Conservation Rating	3	4	2	3	3	3
Conservation Trends	3	4	3	3	3	3

Connectivity

1 Homogenous and/or continuous habitat
2 Low level of fragmentation including roads
3 Intermediate fragmentation and clearing with adequate stepping stones
4 Significant fragmentation and clearing with inadequate habitat stepping stones
5 Cleared land

Habitat layers

1 0 – 5 %
2 6 – 25 %
3 26 – 50 %
4 51 – 75 %
5 76 – 100 %

Hollows

1 None
2 Few
3 Some
4 Most
5 All

Water sources

1 At least one dam
2 Permanent stream present
3 Perennial stream
4 Nearby permanent water sources
5 No nearby permanent water sources

Conservation status

1 High quality, self-regenerating, high resilience
2 Some disturbance and some loss of resilience
3 Some conservation value but with significant levels of disturbance
4 Degraded with significant loss of resilience, no regeneration occurring
5 Highly degraded, restoration needed rather than regeneration

Weeds

1 None
2 Perimeter only
3 Light
4 Heavy
5 Very Heavy

Conservation Trends

1 Self-sustaining and pristine or near pristine under current management
2 Under appropriate management will return to 1 through regeneration strategies
3 Balanced between being able to return to 2 and then 1 or to further degraded and eventually require restoration
4 Trending to localised extinction. Requires high cost restoration strategies.

APPENDIX E LIKELIHOOD OF OCCURENCE

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Amphibians							
Crinia sloanei	Sloane's Froglet	V	E	78	The Sloane's Froglet is a small ground dwelling frog. It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. Sloane's Froglet has been recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with the majority of records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales.	Considering the records within the locality and the presence of preferred habitat, this species has is **likely** to occur within the A2I Proposal site.	No
Litoria raniformis	Southern Bell Frog	E	V	1	The Southern Bell Frog is usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. The species has been known to breed anytime from early spring through to late summer/early autumn (Sept to April) following a rise in water levels. During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi (*Typha* spp.) or Common Reeds) within or at the edge of slow-moving streams, marshes, lagoons, lakes, farm dams and rice crops. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks.	Considering records mostly not associated with the locality of the A2I Proposal site and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Birds							
Anseranas semipalmata	Magpie Goose	V	-	1	The Magpie Goose is a large, distinctive black and white water-bird. The Magpie Goose is mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level; most breeding now occurs in monsoonal areas; nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW. Often seen in trios or flocks on shallow wetlands, dry ephemeral swamps, wet grasslands and floodplains; roosts in tall vegetation.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Anthochaera phrygia	Regent Honeyeater	CE	CE	2	The Regent Honeyeater mainly inhabits temperate woodlands and open forests, particularly Box – Ironbark woodland and riparian forests of River Sheoak. The species inhabits woodlands that support a significantly high abundance and species richness of birds. These type of woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The species can also be found in drier coastal woodlands and forests in some years. Non-breeding flocks of the species can be seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests. Although the species is a generalist forager, it feeds mainly on the nectar from a small number of eucalypts that produce high volumes of nectar (e.g. Mugga Ironbark, Yellow Box, White Box and Swamp Mahogahy).	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Apus pacificus	Fork-tailed Swift	-	Mi	3	The Fork-tailed Swift is a migratory bird that visits Australia during its non-breeding season. The species is almost exclusively aerial, flying from less than 1 metre to at least 300 metres above ground. It is an aerial eater believed to forage on insects.	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the A2I Proposal site.	No
Artamus cyanopterus	Dusky Woodswallow	V	-	5	The Dusky Woodswallow primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. The species forages on invertebrates, mainly insects, which are captured whilst hovering or sallying above the canopy or over water. It builds an open, cup-shape nest made of twigs, grass, fibrous rootlets and occasionally casuarina needles. Generally, nests are located on shrubs or low trees, living or dead, horizontal or upright forks in braches, spouts, hollow stumps or logs, behind loose bark or in a hollow in the top of a wooden fence post.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Burhinus grallarius	Bush Stone-curlew	E	-	6	The Bush Stone-curlew is a ground bird that inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. It is largely nocturnal, being especially active on moonlit nights. It feeds on insects and small vertebrates, such as frogs, lizards and snakes. It builds its nest on the ground in a scrape or small bare patch. Two eggs are laid in spring and early summer.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Botaurus poiciloptilus	Australasian Bittern	E	E	0	The Australasian Bittern is a large, stocky bird that favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.) as habitat. It hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. The bird's feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains. Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch.	Considering the lack of records within the locality and the presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Calidris acuminata	Sharp-tailed Sandpiper	-	Mi	7	The Sharp-tailed Sandpiper is a migratory wader bird that occurs across Australia, including inland and coastal areas during its non-breeding season. In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands, and coastal areas with much beachcast seaweed. Sometimes they occur on rocky shores and rarely on exposed reefs.	Considering the records within the locality and presence of suitable habitat, this species has **potential** to occur within the A2I Proposal site.	No
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	8	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee (OEH 2019). In spring and summer, the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. It may also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora*) woodland and occasionally in temperate rainforests. The species favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	9	The glossy black-cockatoo lives in coastal woodlands and drier forest areas, open inland woodlands, or timbered watercourses where its main food source, the casuarina (she-oak) is common. The glossy black-cockatoo generally prefers to feed from the seeds of mature Allocasuarina trees and to a lesser extent Casuarina trees. The birds' presence is often indicated by a layer of cracked cones and fragments that have accumulated under favoured casuarina trees. The glossy black-cockatoo prefers to nest in the hollows of large, old eucalypt trees, alive or dead. The typical nest site will be around 3 to 30 metres above the ground, and the nest hollow is generally lined with decayed debris.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Chthonicola sagittata	Speckled Warbler	V	-	10	The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding. The rounded, domed, roughly built nest of dry grass and strips of bark is located in a slight hollow in the ground or at the base of a low dense plant, often among fallen branches and other litter. A side entrance allows the bird to walk directly inside. A clutch of 3-4 eggs is laid, between August and January, and both parents feed the nestlings. Speckled Warblers often join mixed species feeding flocks in winter, with other species such as Yellow-rumped, Buff-rumped, Brown and Striated Thornbills.	Considering the records within the locality (including nearby at Kappoka) and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Circus assimilis	Spotted Harrier	V	-	11	The Spotted Harrier is a predatory bird that occurs throughout the Australian mainland, except in densly forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including *Acacia* and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months. Preys on terrestrial mammals (eg bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Climacteris picumnus	Brown Treecreeper	V	-	2	The Brown Treecreeper (eastern subspecies) is found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. It is considered resident of areas where it occurs and is usually observed in pairs or small groups of 8 to 12 birds. It forages on trunks and branches of trees and among fallen timber. Hollows in standing dead or live trees and stumps are essential for nesting.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Daphoenositta chrysoptera	Varied Sittella	V	-	3	Varied Sittella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. It feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. It builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. Generation length is estimated to be 5 years. The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Epthianura albifrons	White-fronted Chat	V	-	5	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.	Considering the records within the locality and presence of suitable habitat, this species is **Potential** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Falco hypoleucos	Grey Falcon	E	-	6	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Falco subniger	Black Falcon	V	-	7	The Black Falcon is a bird of prey which is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres. The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Gallinago hardwickii	Latham's Snipe	V	-	8	Latham's Snipe is a wader and the largest snipe in Australia. It is a non-breeding visitor to south-eastern Australia and an occasional visitor to Norfolk Island, Lord Howe Island and possibly to Macquarie Island. It usually occurs singly or in small, loose groups of less than a dozen birds. Migrating flocks may contain up to 200 birds when they arrive in Australia. In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity. Other freshwater habitats that can be used by the species include bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. Latham's Snipe occurs in temperate and tropical regions of Australia. Its altitudinal range extends from sea-level (i.e. the coast) or possibly below. There are records from near Lake Eyre.	Considering the records within the locality and presence of suitable habitat, this species is **potential** to occur within the A2I Proposal site.	No
Glossopsitta pusilla	Little lorikeet	V	-	9	The Little Lorikeet is a small parrot distributed widely across the coast and Great Divide regions. The species forages primarily in the canopy of open Eucalyptus forests and woodland. It also forages in *Angophora*, *Melaeuca* and other species including paddock, roadside remnants and urban trees. It feeds mainly on nectar and pollen, occasionally on native fruits.	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the A2I Proposal site.	No
Grantiella picta	Painted Honeyeater	V	V	2	The Painted Honeyeater inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Grus rubicunda	Brolga	V	-	1	The Brolga was formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. It is still abundant in the northern tropics, but very sparse across the southern part of its range. Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged. They feed using their heavy straight bill as a 'crowbar' to probe the ground or turn it over, primarily on sedge roots and tubers. They will also take large insects, crustaceans, molluscs and frogs.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	2	The White-bellied Sea-eagle is a large eagle that occurs around the Australian coast, including most of NSW and its oceanic waters. The species may be solitary, or live in pairs or small family groups consisting of a pair of adults and dependent young. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass. Feed mainly on fish and freshwater turtles, but also waterbirds, reptiles, mammals and carrion	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Hieraaetus morphnoide	Little Eagle	V	-	3	The Little Eagle is a forest bird found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used. It nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Females lay two or three eggs during spring, and young fledge in early summer. The species preys on birds, reptiles and mammals, occasionally adding large insects and carrion (OEH 2019).	Considering the records within the locality (including nearby at Kapooka) and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Hirundapus caudacutus	White-throated Needletail	-	V, Mi	4	The White-throated Needletail is a large swift widespread in eastern and south-eastern Australia during its non-breeding season. The species breeds in Asia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. In Australia, White-throated Needletails almost always forage aerially, at heights up to 'cloud level', above a wide variety of habitats ranging from heavily treed forests to open habitats, such as farmland, heathland or mudflats.	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the A2I Proposal site	No
Lathamus discolor	Swift Parrot	E	CE	5	The Swift Parrot breeds in Tasmania and migrates to south-east Australia during its non-breeding stage (March to October). In the mainland, the species occurs in areas where eucalypts are flowering profusely or where there are abundant lerp infestations. Favoured feed trees include Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*) and White Box (*E. albens*).	Considering the records within the locality c (including nearby at Kapooka) and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	-	6	The Major Mitchell's Cockatoo is found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. The species inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. It feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. The species is normally found in pairs or small groups, though flocks of hundreds may be found where food is abundant. It nests in tree hollows and nesting occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres	Considering the records within the locality (including nearby at Kapooka) and the presence of preferred habitat, this species is **likely** to occur within the A2I Proposal site.	No
Melanodryas cucullata	Hooded Robin (south-eastern form)	V	-	7	The Hooded Robin is a large Australian robin with widespread distribution. It is found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. The south-eastern form (subspecies *cucullata*) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies *picata*. Two other subspecies occur outside NSW. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Melithreptus gularis	Black-chinned Honeyeater (eastern subspecies)	V	-	8	In NSW, the Black-chinned Honeyeater is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions, though it is very rare in the latter.	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
					Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (E. microcarpa), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. It is a gregarious species usually seen in pairs and small groups of up to 12 birds. Feeding territories are large making the species locally nomadic. Recent studies have found that the Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares. Moves quickly from tree to tree, foraging rapidly along outer twigs, underside of branches and trunks, probing for insects. Nectar is taken from flowers, and honeydew is gleaned from foliage. Breeds solitarily or co-operatively, with up to five or six adults, from June to December.		
Neophema pulchella	Turquoise Parrot	V	-	3	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range (OEH 2019). The Turquoise Parrot lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Usually seen in pairs or small, possibly family, groups and have also been reported in flocks of up to thirty individuals. It prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Forages quietly and may be quite tolerant of disturbance. However, if flushed it will fly to a nearby tree and then return to the ground to browse as soon as the danger has passed. It nests in tree hollows, logs or posts, from August to December. It lays four or five white, rounded eggs on a nest of decayed wood dust (OEH 2019).	Considering the records within the locality and the presence of suitable habitat, this species has the potential to occur within the A2I Proposal site.	No
Ninox connivens	Barking Owl	V	-	1	The Barking Owl is found throughout continental Australia except for the central arid regions. It inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile riparian soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as *Acacia* and *Casuarina* species. During nesting season, the male perches in a nearby tree overlooking the hollow entrance. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Common Ringtail Possums, but when loss of tree hollows decreases these prey populations the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Can catch bats and moths on the wing, but typically hunts by sallying from a tall perch. Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats. The species has not been recorded at the site, the nearest records are located at approximately 6.5 km north-west from the site where it was recorded in1985 and 1990.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Oxyura australis	Blue-billed Duck	V	-	32	The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed, but prefers to dive if approached. Blue-billed Ducks will feed by day far from the shore, particularly if dense cover is available in the central parts of the wetland. They feed on the bottom of swamps eating seeds, buds, stems, leaves, fruit and small aquatic insects such as the larvae of midges, caddisflies and dragonflies. Blue-billed Ducks are partly migratory, with short-distance movements between breeding swamps and overwintering lakes with some long-distance dispersal to breed during spring and early summer.	Considering the records within the locality but the lack of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Numenius madagascariensis	Far Eastern Curlew	-	CE	0	The Eastern Curlew is a wader bird with primarily coastal distribution in Australia. In NSW the species occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast. It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. It roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. May also roost on wooden oyster leases or other similar structures. The Eastern Curlew is carnivorous, mainly eating crustaceans (including crabs, shrimps and prawns), small molluscs, as well as some insects.	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Pedionomus forguatus	Plains-wanderer	E	CE	0	The Plains-wanderer is a small quail-like ground-dwelling grassland bird with a very patchy distribution in NSW. The species has a stronghold in the western Riverina bounded by Hay and Narrandera on the Murrunbidgee River in the north, the Cobb Highway in the west, the Billabong Creek in the south, and Urana in the east. Suitable habitat for the species decreases during very wet or dry years when grasslands become too dense or are grazed too bare for Plains-wanderers. Plains-wanderers live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. These grasslands support a high diversity of plant species, including a number of state and nationally threatened species. Habitat structure appears to play a more important role than plant species composition. Preferred habitat of the Plains-wanderer typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses. Most of the grassland habitat of the Plains-wanderer is <5 cm high, but some vegetation up to a maximum of 30 cm is important for concealment, as long as grass tussocks are spaced 10-20 cm apart. During prolonged drought, the denudation of preferred habitats may force birds into marginal denser and taller grassland habitats that become temporarily suitable. The average home range of a single bird is about 12 ha. Breeding pairs have overlapping home ranges that total approximately 18 ha.	Considering the lack of records within the locality and presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Pachycephala inornata	Gilbert's Whistler	V	-	3	The Gilbert's Whistler is sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt. The species was probably once distributed almost continuously across the woodlands and mallee of southern NSW, but this range has been greatly reduced, chiefly by clearance of habitat. The Gilbert's Whistler forages on or near the ground in shrub thickets and in tops of small trees. Its food consists mainly of spiders and insects such as caterpillars, beetles and ants, and occasionally, seeds and fruits are eaten.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Leiopoa ocellata	Malleefowl	E	V	0	The Mallefowl is a large ground-dwelling bird. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers.	Considering the lack of records within the locality and the presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Petroica boodang	Scarlet Robin	V	-	4	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Its habitat usually contains abundant logs and fallen timber: these are important components of its habitat. It breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. It breeds between July and January. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. It builds nests in the fork of branches, usually more than 2 metres above the ground.	Considering the records within the locality (including nearby at Kappoka) and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Petroica phoenicea	Flame Robin	V	-	5	The Flame Robin is a small insectivorous robin endemic to south eastern Australia. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains). Often occurs in recently burnt areas; however, habitat becomes unsuitable as vegetation closes up following regeneration. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees. In winter, occasionally seen in heathland or other shrublands in coastal areas. Birds forage from low perches, from which they sally or pounce onto small invertebrates which they take from the ground or off tree trunks, logs and other coarse woody debris.	Considering the records within the locality (including nearby at Kappoka) and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Plegadis falcinellus	Glossy Ibis	-	Mi	6	The Glossy Ibis is the smallest ibis known in Australia, where it is generally located east of the Kimberley in Western Australia and Eyre Peninsula in South Australia. The species is also known to be patchily distributed in the rest of Western Australia. The species is rare or a vagrant in Tasmania. The Glossy Ibis' preferred habitat for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Polytelis swainsonii	Superb Parrot	V	V	7	The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. The Superb Parrot inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Nest in small colonies, often with more than one nest in a single tree. Breed between September and January. May forage up to 10 km from nesting sites, primarily in grassy box woodland.	This species was identified during the August 2019 Field Surveys – **Known**.	Yes
Pomatostomus temporalis	Grey-crowned Babbler (eastern subspecies)	V	-	8	The Grey-crowned Babbler inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions. Flight is laborious so birds prefer to hop to the top of a tree and glide down to the next one. Birds are generally unable to cross large open areas. It lives in family groups that consist of a breeding pair and young from previous breeding seasons. A group may consist of up to fifteen birds. All members of the family group remain close to each other when foraging. It is insectivorous and it forages on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses. It builds nests that are used as dormitory and roosting and uses them all year round. It breeds between July and February. Territory ranges from one to 50 hectares (usually ten hectares) and are defended all year. Grey-crowned Babblers are communal breeders that form a family group, in which offspring from the previous season and other unrelated birds help to raise the current's year's brood. In some populations, breeding success is related to the number of helpers. Young birds stay with the family group for at least one year after fledging and may remain for two or more years acting as non-breeding helpers. As breeding spaces become available in the population, some helpers may disperse to establish their own breeding group. Population viability studies in Victoria suggests that a viable population is likely to contain more than ten family groups, while populations with less than ten family groups are likely to have high rate of extinction.	This species has been previously recorded within the rail corridor at Kapooka within characteristic nests occurring within 100m of the Proposal site (pers. Comm. David Sharpe). **Known**	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Rostratula australis	Australian Painted-snipe	E	E	0	The Australian Painted Snipe is small freshwater wader. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves. Breeding is often in response to local conditions; generally occurs from September to December. Incubation and care of young is all undertaken by the male only. Forages nocturnally on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Stagonopleura guttata	Diamond Firetail	V	-	9	Diamond Firetails are found in open grassy woodland, heath and farmland or grassland with scattered trees. Diamond Firetails feed on the ground and generally eat ripe or partially ripe seeds and can be seen hopping around on the ground. They occasionally eat insects and their larvae. The Diamond Firetail builds a nest with green grass blades and stems and lines it with fine grasses and feathers. The nest can be found in trees and shrubs with dense foliage and has sometimes been known to build in the base of a hawk's nest.	Considering the records within the locality (including nearby at Kappoka) and the presence of preferred habitat, this species is **likely** to occur within the A2I Proposal site.	No
Monarcha melanopsis	Black-faced Monarch	-	Mi	0	The Black-faced Monarch is an insectivorous bird widespread in eastern Australia. In New South Wales and the Australian Capital Territory, the species occurs around the eastern slopes and tablelands of the Great Divide, inland to Coutts Crossing, Armidale, Widden Valley, Wollemi National Park, Wombeyan Caves and Canberra. It is rarely recorded farther inland (e.g. Munghorn Gap Nature Reserve, and Maules Creek, 50 km south-east of Narrabri. The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. The species also occurs in selectively logged and 20—30 years old regrowth rainforest. It is also sometimes found in nearby open eucalypt forests (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands, often with a patchy understorey. The species especially occurs in 'marginal' habitats during winter or during passage (migration).	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Motacila flava	Yellow Wagtail	-	Mi	0	The Yellow Wagtail is a non-breeding bird in Australia. It is insectivorous and inhabits open country near water, such as meadows. Its habitat is listed as consist of wetlands (inland), artificial/aquatic and marine, grassland and shrubland. This species occupies a range of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppe and grassy tundra. In the north of its range it is also found in large forest clearings. It feeds on a wide variety of terrestrial and aquatic invertebrates as well as some plant material, particularly seeds. The species is almost wholly migratory with European populations wintering in sub-Saharan Africa, central and eastern populations mainly migrate to South Asia with some moving to Africa. The species is resident in Egypt.	Considering the lack of records within the locality and presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Rhipidura rufifrons	Rufous Fantail	-	Mi	0	The Rufous Fantail occurs in coastal and near coastal districts of northern and eastern Australia. *Rhipidura rufifrons* has breeding populations occurring from about the South Australia-Victoria border, through south and central Victoria, on and east of the Great Divide in New South Wales (NSW), and north to about the NSW-Queensland border; and *R. r. intermedia* has breeding populations occurring on and east of the Great Divide, from about the NSW-Queensland border, north to the Cairns-Atherton region, Queensland. In east and south-east Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (*Eucalyptus microcorys*), Mountain Grey Gum (*E. cypellocarpa*), Narrow-leaved Peppermint (*E. radiata*), Mountain Ash (*E. regnans*), Alpine Ash (*E. delegatensis*), Blackbutt (*E. pilularis*) or Red Mahogany (*E. resinifera*); usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests; for example near Bega in south-east NSW, where they are recorded in temperate Lilly Pilly (*Acmena smithi*) rainforest, with Grey Myrtle (*Backhousia myrtifolia*), Sassafras (*Doryphora sassafras*) and Sweet Pittosporum (*Pittosporum undulatum*) subdominants. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests. When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, including Spotted Gum (*Eucalyptus maculata*), Yellow Box (*E. melliodora*), ironbarks or stringybarks, often with a shrubby or heath understorey. They are also recorded from parks and gardens when on passage.	Considering the lack of records within the locality and presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Actitis hypoleucos	Common Sandpiper	-	Mi	0	The Common Sandpiper is a migratory bird inhabiting coastal habitats and sometimes freshwater wetlands. It also occurs in non-tidal swamps, streams, lakes and lagoons on the coast and sometimes inland. In Australia, the Common Sandpiper is a non-breeding visitor. It is found along all coastlines of Australia and in many areas inland, the Common Sandpiper is widespread in small numbers. The population when in Australia is concentrated in northern and western Australia. In NSW, there is no areas of national importance with regards to maximum counts of the species.	Considering the lack of records within the locality and presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Calidris ferrunginea	Curlew Sandpiper	E	CE, Mi	0	The Curlew Sandpiper is a small migratory shorebird that visits Australia during its non-breeding season. The species is present in Australia between August and November. The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. It roosts on shingle, shell or sand beaches; spits or islets on the coast or in wetlands; or sometimes in salt marsh, among beach-cast seaweed, or on rocky shores. Curlew Sandpipers are omnivorous, feeding on worms, molluscs, crustaceans, insects and some seeds.	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Stictonetta naevosa	Freckled Duck	V	-	4	The Freckled Duck is a water bird found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally rest in dense cover during the day, usually in deep water. Feed at dawn and dusk and at night on algae, seeds and vegetative parts of aquatic grasses and sedges and small invertebrates.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Fish							
Galaxias rostratus	Flathead Galaxias	E (FM Act)	CE	0	Flathead Galaxias are found in still or slow moving water bodies such as wetlands and lowland streams. The species has been recorded forming shoals. They have been associated with a range of habitats including rock and sandy bottoms and aquatic vegetation. Flathead Galaxias spawn in spring and lay slightly adhesive demersal eggs. Flathead Galaxias, also known as Murray jollytail are a small native fish that are known from the southern part of the Murray Darling Basin. They have been recorded in the Macquarie, Lachlan, Murrumbidgee and Murray Rivers in NSW. They have not been recorded and are considered locally extinct in the lower Murray, Murrumbidgee, Macquarie and Lachlan Rivers. The species is now only known from the upper Murray River near Tintaldra and wetland areas near Howlong.	Considering the species is within the distribution as specified by NSW Department of Primary Industries and that the suitable habitat exists, this species has the **potential** to occur within the A2I Proposal site (Murray and Murrumbidgee Rivers).	No
Maccullochella peelii	Murray Cod	-	V	0	The Murray Cod is a large freshwater fish endemic to the Murray-Darling Basin, from south east Queensland, through NSW, into Vitoria and South Australia. The species can grow to 100 kg in the wild. The species requires permanent streams and is highly dependent on instream woody structures for habitat, is highly territorial and very aggressive.	Considering the species is not within the distribution as specified by NSW Department of Primary Industries and that the suitable habitat does not exists, this species is **unlikely** to occur within the A2I Proposal site.	No
Macquaria australasica	Macquarie Perch	E (FM Act)	E	0	Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury/Nepean and Shoalhaven catchments.	Considering the species is within the distribution as specified by NSW Department of Primary Industries and that the suitable habitat exists, this species has the **potential** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Flora							
Amphibromus fluitans	Floating Swamp Wallaby-grass	V	V	23	The Floating Swamp Wallaby-grass is a perennial grass that is virtually aquatic, often with only the flower heads above the water. It grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons with *Potamogeton* and *Chamaeraphis* species. Flowering time is from spring to autumn or November to March. Disturbance regimes are not known, although the species requires periodic flooding of its habitat to maintain wet conditions. It has been observed covering several hectares in area. The species is also recorded as occasional too common in populations.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Austrostipa wakoolica	A Spear-grass	E	E	0	*Austrostipa wakoolica* is a densely-tufted perennial grass confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest (now part of South West Woodland Nature Reserve). Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include *Callitris glaucophylla, Eucalyptus microcarpa, E. populnea, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha* and *Einadia nutans*.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Brachyscome muelleroides	Mueller Daisy	V	V	0	The Claypan Daisy is an annual herb that produces white flowers from September to November. It occurs in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas. Also occurs in north-central Victoria (only along the Murray from Tocumwal to the Ovens River). Grows in damp areas on the margins of claypans in moist grassland with *Pycnosorus globosus*, *Agrostis avenacea* and *Austrodanthonia duttoniana*. Also recorded from the margins of lagoons in mud or water, and in association with *Calotis anthemoides*. Victorian collections have generally come from open positions on the Murray River floodplain, swampy River Red Gum (*Eucalyptus camaldulensis*) Forest and damp depressions.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Caladenia arenaria	Sand-hill Spider Orchid	E	E	0	The Sand-hill Spider-orchid flowers between September and November. The Sand-hill Spider Orchid is currently only known to occur in the Riverina between Urana and Narranderra. Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (*Callitris glaucophylla*).	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2IAtudy Area.	No
Caladenia concolor	Crimson Spider Orchid	E	V	3	The Crimson Spider Orchid flowers generally in September. The species is known to occur at Nail Can Hill Crown Reserve near Albury (Albury LGA), a private property near Bethungra (Junee LGA) and at Burrinjuck Nature reserve (Yass Valley LGA). Its habitat is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids. The dominant trees are Blakely's Red Gum (*Eucalyptus blakelyi*), Red Stringybark (*E. macrorhyncha*), Red Box (*E. polyanthemos*) and White Box (*E. albens*); the diverse understorey includes Silver Wattle (*Acacia dealbata*), Hop Bitter-pea (*Daviesia latifolia*), Common Beard-heath (*Leucopogon virgatus*), Spreading Flax-lily (*Dianella revoluta*) and Poa Tussock (*Poa sieberiana*).	Considering the records within the locality and the presence of suitable (lack of granite geological areas) habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Leucochrysum albicans var. tricolor	Hoary Sunray	-	E	3	The Hoary Sunray is a perennial everlasting daisy. The species is endemic to south-eastern Australia and occurs in the ACT, NSW, Victoria and Tasmania. In NSW, it occurs on the Southern Tablelands and in an area roughly bounded by Albury, Bega and Goulburn. areas Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. It can occur in modified habitats such as semi-urban areas and roadsides. The species is highly dependent on the presence of bare ground for germination. In some areas, disturbance is required for successful establishment.	Considering the records within the locality and the presence of preferred habitat, this species is **likely** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Glycine latrobeana	Purple Clover	CE	V	0	The Clover Glycine is a low-growing herb that generally flowers in spring in the lower elevation parts of its range and in summer in higher elevation areas. The Clover Glycine occurs mainly in grassland and grassy woodland habitats, less often in dry forests, and only rarely in heathland. Populations occur from sea level to c. 1,200 m altitude 6 (900 m in Tasmania). In Victoria, plants grow in a range of soil types including alluvial soils, and those derived from sandstones, mudstones, granite and basalt. Soils are usually clay, but may also have high loam content. Tasmanian populations occur on a well-drained basalt, dolerite or sandstone substrates. The NSW population is in subalpine grassland (at about 1300 m asl).	Considering the lack of records within the locality and the presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Prasophyllum petilum	Tarengo Leek Orchid	-	E	0	The Tarengo Leek Orchid produces a flower-spike in mid spring to early summer. Natural populations of the species are known at five sites in NSW located near Boorowa (Hilltops LGA), in Queanbeyan area (Queanbeyan-Palerang LGA), Ilford (Mid-Western LGA), Delegate (Snowy Monaro LGA) and west of Muswellbrook (Muswellbrook LGA). It grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees *Leptospermum* spp. near Queanbeyan and within the grassy groundlayer dominated by Kanagroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT). Apparently highly susceptible to grazing, being retained only at little-grazed travelling stock reserves (Boorowa & Delegate) and in cemeteries (near Queanbeyan, Ilford and Hall). Flowers in October at Boorowa and Ilford, and December at sites near Queanbeyan and Delegate. Population density at the Boorowa site is higher in the open grassland dominated by wallaby grasses Austrodanthonia spp., compared to that within the denser stands of Kangaroo Grass *Themeda australis*. Highly colonial, with very large numbers present and very conspicuous at the Boorowa site, but cryptic at the Queanbeyan, Ilford and Delegate sites where low numbers are recorded. The population near Muswellbrook is also small.	Considering the lack of records within the locality and the presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Swainsona murrayana	Slender Darling-pea	V	V	0	The Slender Darling Pea is a forb that produces pink or purple flowers. Found throughout NSW, it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with Maireana species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.	Considering the lack of records within the locality and the presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Swainsona recta	Small Purple Pea	E	E	0	The Small Purple-pea is a small perennial herb that flowers between late September and early December, with a peak in October. Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum (*Eucalyptus blakelyi*), Yellow Box (*E. melliodora*), Candlebark Gum (*E. rubida*) and Long-leaf Box (*E. goniocalyx*). Grows in association with understorey dominants that include Kangaroo Grass (*Themeda australis*), poa tussocks (*Poa* spp.) and spear-grasses (*Austrostipa* spp.). Plants die back in summer, surviving as a rootstocks until they shoot again in autumn. Small Purple-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas.	Considering the lack of records within the locality and the presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Senecio garlandii	Woolly Ragwort	V	-	8	This daisy is found between Temora, Bethungra and Albury and possibly Burrinjuck near Yass. The largest populations are at The Rock and Mt Tabletop (and surrounds). There is a single population in Victoria at Chiltern. Woolly Ragwort occurs on sheltered slopes of rocky outcrops	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Tylophora linearis		V	E	0	*Tylophora linearis* is a vine that produces purplish flowers in spring, with flowers recorded in November and May. Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla* and *Allocasuarina luehmannii*. Also grows in association with *Acacia hakeoides*, *Acacia lineata*, *Melaleuca uncinata*, *Myoporum* species and *Casuarina* species. Majority of records occur in the central western region. Records from Goonoo, Pillaga West, Pillaga East, Bibblewindi, Cumbil and Eura State Forests, Coolbaggie NR, Goobang NP and Beni SCA. Also has been recorded Hiawatha State Forest near West Wyalong in the south and there are old records as far north as Crow Mountain near Barraba and near Glenmorgan in the western Darling Downs.	Considering the lack of records within the locality but presence of preferred habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Insects							
Synemon plana	Golden Sun Moth	E	CE	0	The Golden Sun Moth is a medium-sized, day-flying (diurnal) moth. It occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which ground layer is dominated by wallaby grasses (*Austrodanthonia* spp.). Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males. Habitat may contain several wallaby grass species, which are typically associated with other grasses particularly spear-grasses (*Austrostipa* spp.) or Kangaroo Grass (*Themeda australis*).	Considering the lack of records within the locality, predicted distribution of the species and the presence of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Thaumatoperla alpina	Alpine Stonefly	-	E	0	The Alpine Stonefly is the final instar (growth stage) nymph of an insect of order Plecoptera. The nymph stage is water invertebrate. The Alpine Stonefly is endemic to the Bogong High Plains in the Kiewa River catchment; specifically the Mt McKay and Mt Fainter areas in first order streams (unbranched tributaries) at high altitudes. The species is known from 12 sites that are separated by natural and anthropogenic barriers. The Alpine Stonefly inhabits high altitude areas at least 760 m above sea level, including areas above the treeline. The nymphs are most commonly found in steep, stony, cool streams, often below a cascade of water underneath cobblestones or detritus. Narrower streams of less than 1–2.5 m width are favoured and typically 1 m wide and around 15 cm deep. Nymphs are often found under bigger boulders or stones at these sites. When the nymphs have reached adulthood, they leave the water and inhabit the rocks and vegetation beside the streams. They are often found on the Silky Daisy (*Celmisia sericophylla*), a plant that is endemic to the Bogong High Plains.	Considering the lack of records within the locality and lack of suitable habitat, this species is **unlikely** to occur within the A2I Proposal site.	No
Mammals							
Dasyurus maculatus	Spotted-tailed Quoll	V	E	3	The Spotted-tailed Quoll is recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Nyctophilus corbeni Corben's	South-eastern Long-eared Bat	V	V		Corben's Long-eared Bat inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. It roosts in tree hollows, crevices, and under loose bark. Slow flying agile bat, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground. Mating takes place in autumn with one or two young born in late spring to early summer.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No

Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	4	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania (OEH 2019). The species prefers moist habitats, with trees taller than 20 m. It generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. It hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter. Females are pregnant in late spring to early summer (OEH 2019). Only one record of the species exist within the 10km locality.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	2	Eastern Bentwing-bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Petauroides volans	Greater Glider	E	V	0	The greater glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest), with an elevation range from sea level to 1200 m above sea level. The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. During the day it shelters in tree hollows, with a particular selection for large hollows in large, old trees. The greater glider is considered to be particularly sensitive to forest clearance	Considering the lack of records within the locality and the lack of suitable habitat, this species is **unlikely** to occur within the Proposal site.	No
Myotis macropus	Southern Myotis	V	-	8	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. The Southern Myotis generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. In NSW females have one young each year usually in November or December OEH 2019).	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Petaurus norfolcensis	Squirrel Glider	V and E[3]	-	909	The Squirrel Glider is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range prefers mixed species stands with a shrub or *Acacia* midstorey. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	Considering the immense records within the locality and the presence of preferred habitat, this species is **known** to occur within the A2I Proposal site.	No
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	1	In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Shelter or bask during the day in rock crevices, caves and overhangs and are most active at night when foraging. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Phascolarctos cinereus	Koala	V	V	6	The Koala is an arboreal marsupial that inhabits eucalypt woodlands and forests. The species feed on the foliage of more than 70 species of eucalypt and 30 non-eucalypt species. Food sources in the local area include: *Eucalyptus blakelyi, Eucalyptus bridgesiana, Eucalyptus camaldulensis, Eucalyptus dealbata, Eucalyptus dives, Eucalyptus mannifera, Eucalyptus melliodora, Eucalyptus pauciflora, Eucalyptus polyanthemos, Eucalyptus punctate, Eucalyptus rubida, Eucalyptus tereticornis, Eucalyptus viminalis.*	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No

[3] The Wagga Wagga Squirrel Glider (P*etaurus norfolcensisI)* population is considered Endangered in accordance with the BC Act.

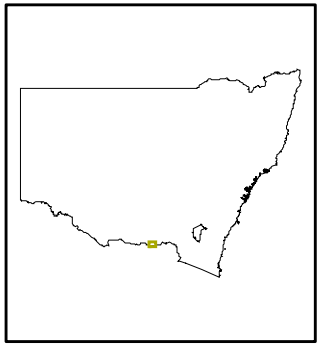
Scientific Name	Common Name	Status (BC Act)	Status (EPBC Act)	Bionet Records with 10km	Habitat Summary	Likelihood of Occurrence	Recorded During Field Surveys
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	344	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Also forage in cultivated gardens and fruit crops.	Considering the immense records within the locality and the presence of preferred habitat, this species is **likely** to occur within the A2I Proposal site.	No
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	4	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Vespadelus baverstocki	Inland Forest Bat	V	-	1	In NSW it has been most regularly captured in the far south west, north from the Murray River to Menindee, and at least as far east as the Balranald-Ivanhoe Road. Roosts in tree hollows and abandoned buildings. Known to roost in very small hollows in stunted trees only a few metres high. The habitat requirements of this species are poorly known but it has been recorded from a variety of woodland formations, including Mallee, Mulga and River Red Gum. Most records are from drier woodland habitats with riparian areas inhabited by the Little Forest Bat. However, other habitats may be used for foraging and/or drinking.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Reptiles							
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	64	The Pink-tailed Legless Lizard inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). The sites where the species occur are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. It is commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites. It feeds on the larvae and eggs of the ants with which it shares its burrows. It is thought that this species lays 2 eggs inside the ant nests during summer; the young first appear in March.	Considering the records within the locality and the presence of suitable habitat, this species has the **potential** to occur within the A2I Proposal site.	No
Delma impar	Striped Legless Lizard	V	V	0	The Striped Legless Lizard is found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. It is also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. The species finds suitable habitat where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass (*Themeda australis*), spear-grasses (*Austrostipa* spp.) and poa tussocks (*Poa* spp.), and occasionally wallaby grasses (*Austrodanthonia* spp.) Sometimes present in modified grasslands with a significant content of exotic grasses. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter. Actively hunts for spiders, crickets, moth larvae and cockroaches. Two papery eggs are laid in early summer. It goes below ground or under rocks or logs over winter.	Considering the lack of records within the locality and the presence of preferred habitat, this species has the **potential** to occur within the A2I Proposal site	No

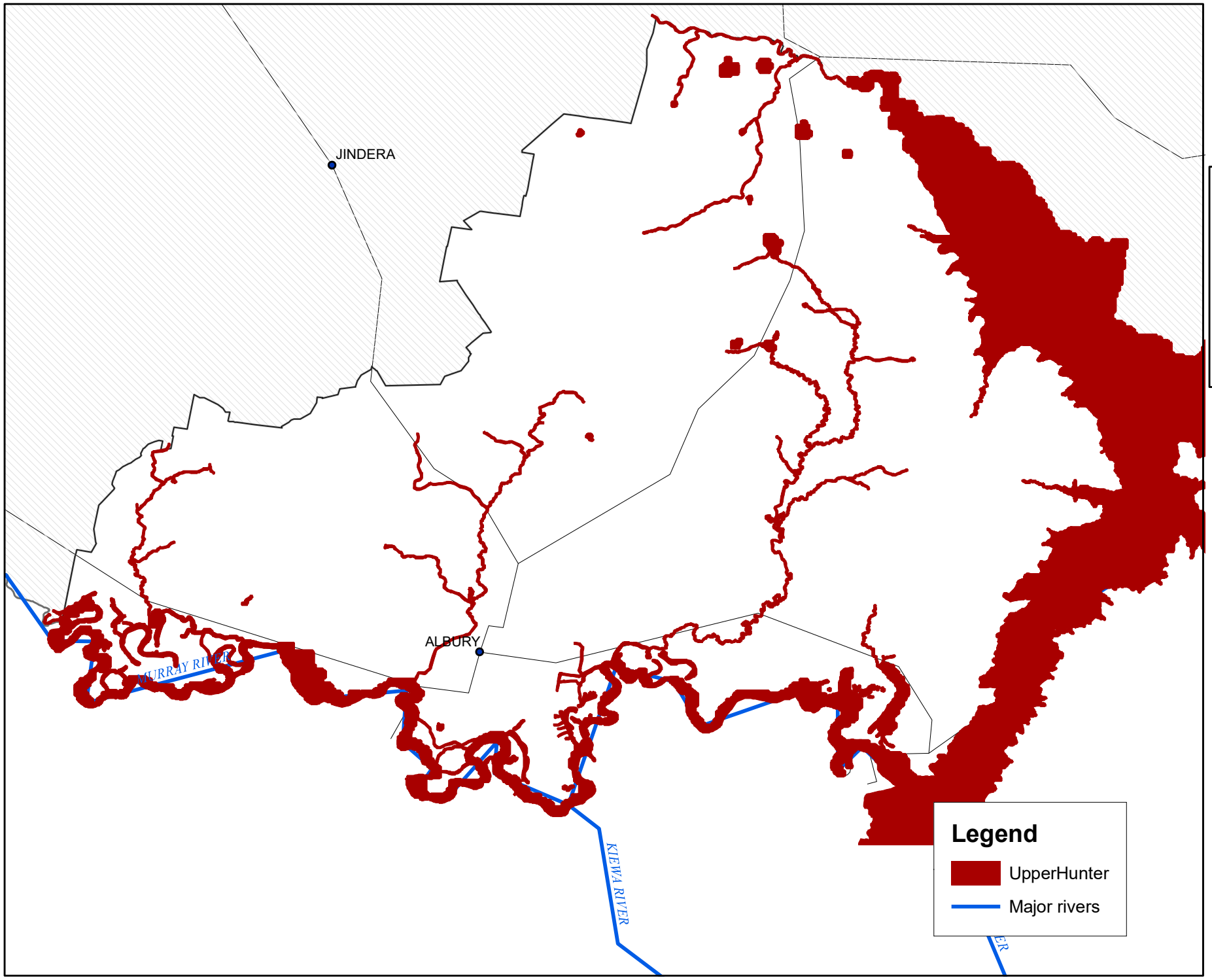
CE = Critically Endangered; E = Endangered; V = Vulnerable; Mi = Migratory

APPENDIX F DPI KEY FISH HABITAT MAPS

Key Fish Habitat

ALBURY





Source: data from the Australian Geoscience, NSW DPI, NSW DECC and NSW LPI
Datum: Geocentric Datum of Australia (GDA)
Grid: Mapping Grid of Australia (MGA94)

Prepared by GIS section, Fisheries Ecosystems Branch, Division of Agriculture & Fisheries, NSW DPI.

0 1 2 4 N

Kilometres

Key Fish Habitat

GREATER HUME LGA

FOREST HILL
LOCKHART
THE ROCK
HENTY
CULCAIRN
HOLBROOK
HOWLONG
RUTHERGLEN
ALBURY
WODONGA
CHILTERN
TALLANGATTA

Source: data from the Australian Geoscience, NSW DPI, NSW DECC and NSW LPI
Datum: Geocentric Datum of Australia (GDA)
Grid: Mapping Grid of Australia (MGA94)

Prepared by GIS section, Fisheries Ecosystems Branch, Division of Fisheries, Compliance and Regional Relations, NSW DPI.

0 4.5 9 18
Kilometres

Legend

- Greater Hume key fish habitat
- Roads
- LPI stream layer (reference only)

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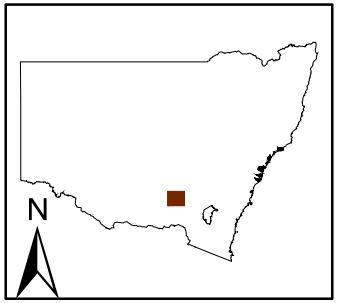
Key Fish Habitat

JUNEE LGA



BETHUNGRA MOUNTAIN

BETHUNGRA

MARRAR

JUNEE

ESTELLA

WAGGA WA

Legend

- Junee key fish habitat
- Roads
- LPI stream layer (reference only)

Source: data from the Australian Geoscience, NSW DPI, NSW DECC and NSW LPI
Datum: Geocentric Datum of Australia (GDA)
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Kilometres

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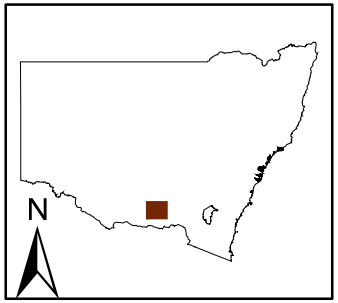
PRIMARY INDUSTRIES

Key Fish Habitat

LOCKHART LGA



BOREE CREEK

LOCKHART

THE ROCK

THE ROCK HILL

YERONG CREEK

HENTY

RAND

Legend

- Lockhart key fish habitat
- Roads
- LPI stream layer (reference only)

Source: data from the Australian Geoscience, NSW DPI, NSW DECC and NSW LPI
Datum: Geocentric Datum of Australia (GDA)
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0 3.5 7 14

Kilometres

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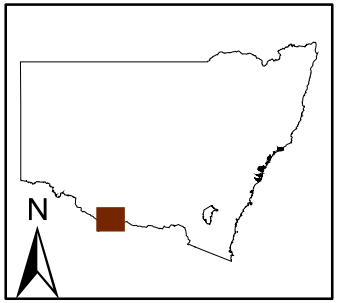
Key Fish Habitat

MURRAY LGA



Source: data from the Australian Geoscience, NSW DPI, NSW DECC and NSW LPI
Datum: Geocentric Datum of Australia (GDA)
Grid: Mapping Grid of Australia (MGA94)

Prepared by GIS section, Fisheries Ecosystems Branch, Division of Fisheries, Compliance and Regional Relations, NSW DPI.

0 2.5 5 10
Kilometres

Legend

- Murray key fish habitat
- Roads
- LPI stream layer (reference only)
- MurrayWetlands

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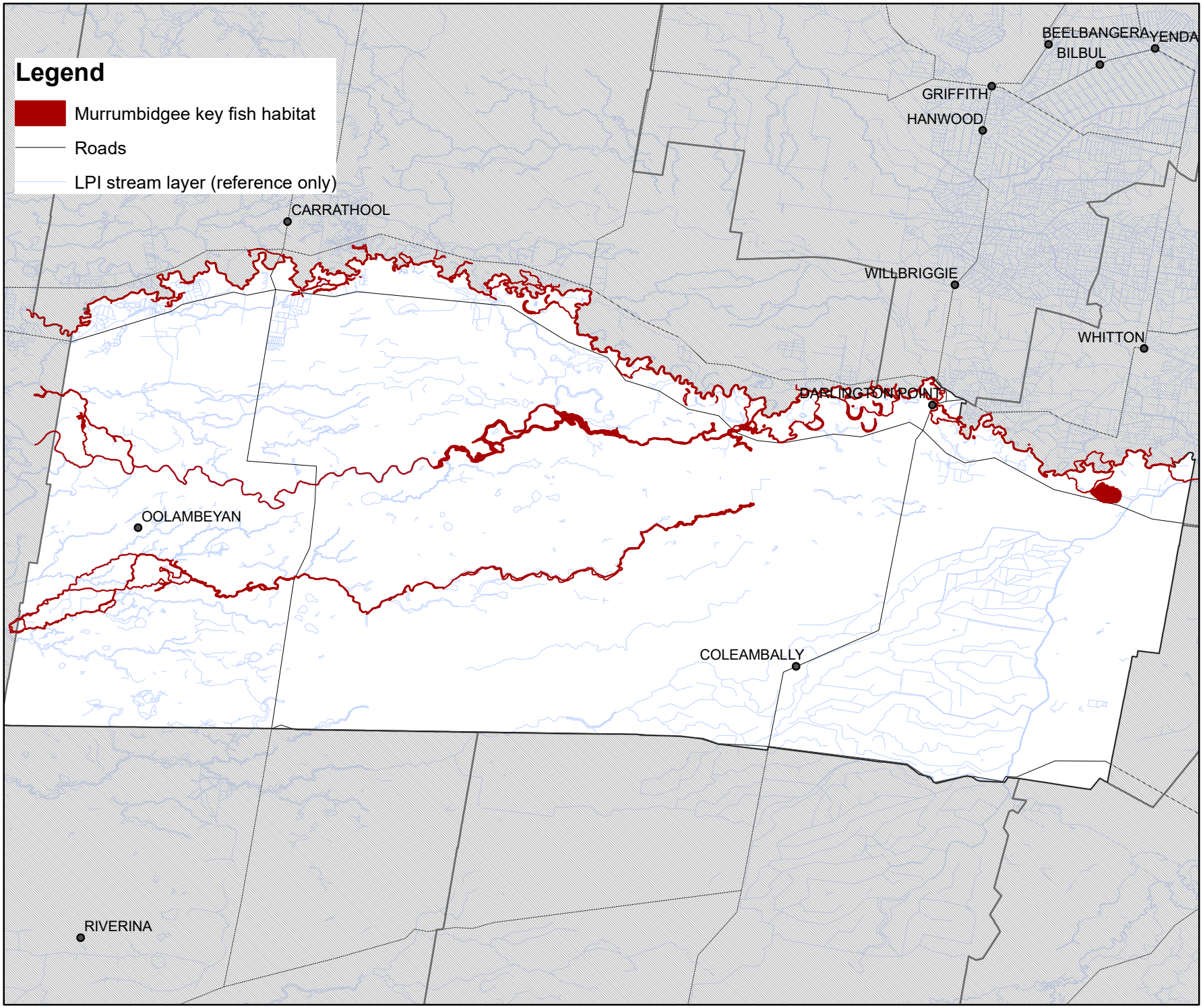
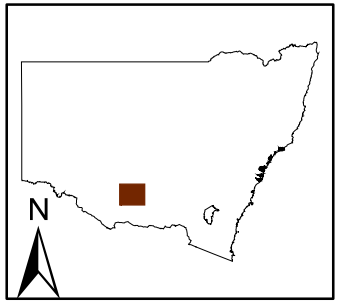
PRIMARY INDUSTRIES



Key Fish Habitat

MURRUMBIDGEE LGA



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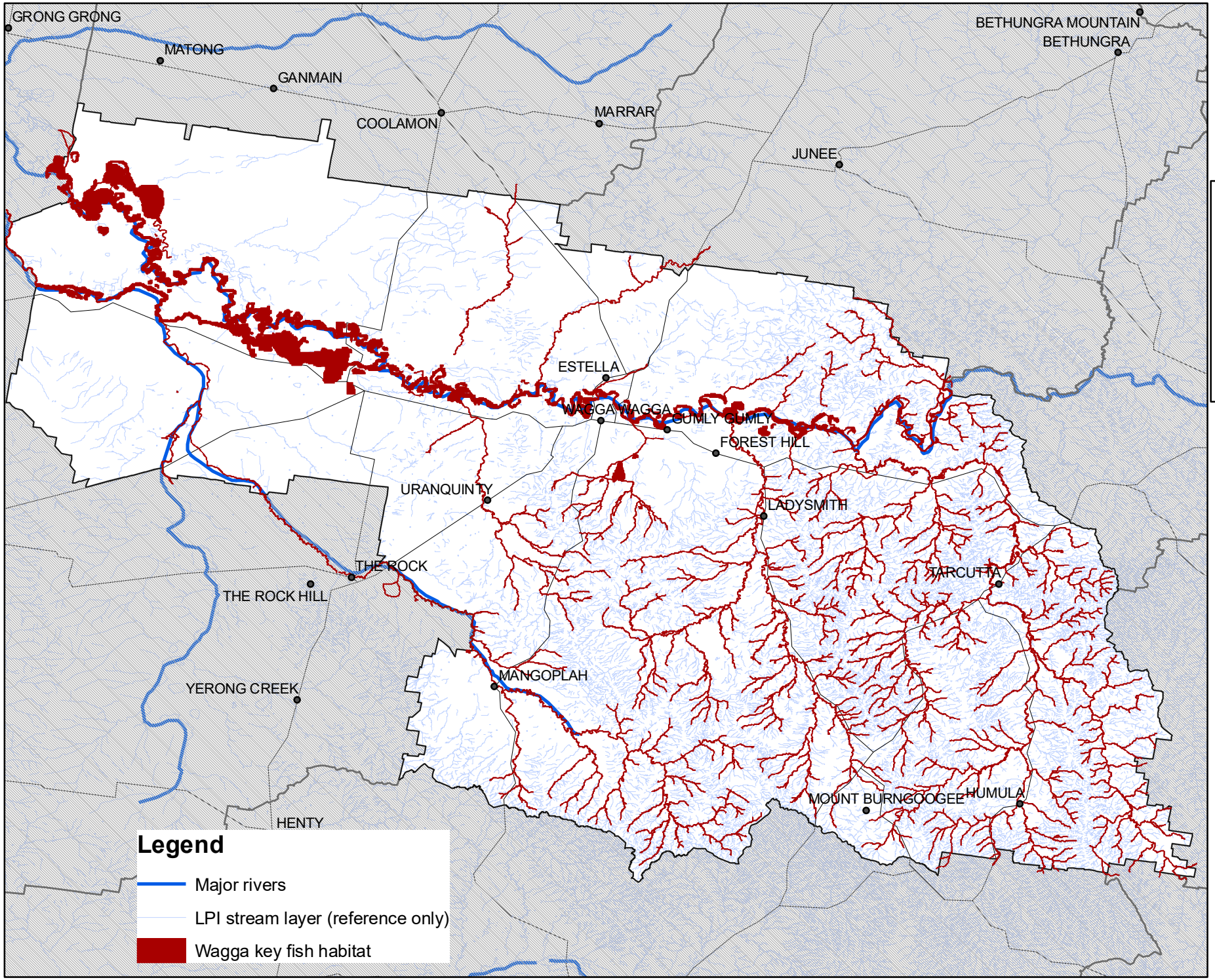
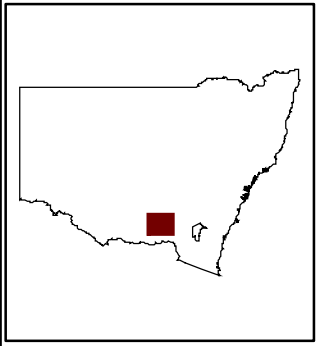


Key Fish Habitat

WAGGA WAGGA LGA



Source: data from the Australian Geoscience, NSW DPI, NSW DECC and NSW LPI
Datum: Geocentric Datum of Australia (GDA)
Grid: Mapping Grid of Australia (MGA94)

Prepared by GIS section, Fisheries Ecosystems Branch, Division of Agriculture & Fisheries, NSW DPI.

0 2.5 5 10

Kilometres

N

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Appendix B Heritage Search Results

Title of Proposal - Inland Rail Project - Albury to Illabo

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Transport - Land

1.2 Provide a detailed description of the proposed action, including all proposed activities.

The Australian Government has committed to delivering the Inland Rail program, which is a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland (Attachment 1).

The Inland Rail program consists of 13 separate proposals, to be delivered over a period of several years (currently anticipated to be about 10 years). Each of the proposals (and, in some cases as appropriate, separate work sites within a proposal) will be subject to an assessment and, if required, approval under the relevant planning or project laws in the relevant jurisdictions. Each assessment will also take into account its part in the Inland Rail program.

Inland Rail is a major nation-building program that will enhance Australia's existing national rail network and serve the interstate freight market.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Albury to Illabo section of Inland Rail (the 'Proposal').

The Proposal would comprise of:

- approximately 26 kilometres of track slewing to allow trains vertical and horizontal clearance at gantries and all rail corridor structures according to Inland Rail clearance specification;
- underbridge and culvert modifications in enhancement sites only, to allow slews to be carried out;
- provision of signaling infrastructure (such as signal gantry);
- aerial cable clearances (including associated overhead powerlines);
- relocation or protection of utilities (such as telecommunications, water mains, etc);
- modification of awnings at station buildings and structures (such as platforms) to maintain a safe distance from the track as currently designed and is subject to further design refinement; and
- operation of ancillary facilities, laydown areas for plant and equipment, personnel and materials and collection of water to supply construction activities, from potential suitable sources.

The land requirement for the proposal would comprise the existing corridor with an average width of 50 metres, with some variation to accommodate particular infrastructure and to cater for local topography. The corridor would be of sufficient width to accommodate the infrastructure currently proposed for construction, as well as future expansion, including possible future requirement for 3,600 metre trains.

Proposal construction would be a single-track standard gauge railway, with crossing loops to accommodate double stacked freight trains up to 1,800 metres long. Components of the construction would include infrastructure to accommodate possible future augmentation and upgrades of the track, including a possible future requirement for 3,600 metre trains. Clearing of the corridor would occur to allow for construction and to maintain the safe operation of the railway.

The key features of the proposal, as currently designed, are included below and are subject to further design and refinement.

No	Enhancement site	Site type	Area (hectare)	Enhancement type
MURRAY RIVER BRIDGE PRECINCT				
1	Murray River Bridge	Rail underbridge	1.24	Raise the height of the existing arches (sway braces) and reinforce the bridge.
ALBURY STATION PRECINCT				
2	Albury Station Footbridge	Footbridge	16.00	Replace the existing over-rail section of the Albury Station Footbridge. Replacement section will tie into the recently built footbridge section over the Hume Freeway.
	Albury Station Signal Box and Relay Room	Signal structures		Track slews required to clear these structures.
3	Riverina Highway Bridge	Road overbridge		Track lowering of the Through and Loop tracks under the highway and associated works including retaining structures and drainage.
	Clearance Works	Structure clearances		Track slews and provision of signaling infrastructure and aerial cable clearances.
WAGGA ROAD BRIDGE				
4	Wagga Road / Billy Hughes Bridge	Bridge	4.87	Lower the track under the highway.
CULCAIRN FOOTBRIDGE				
5	Culcairn Footbridge	Footbridge	0.40	Removal of derelict footbridge.
PEARSON STREET BRIDGE				
6	Pearson Street Bridge	Road overbridge	4.87	Lower the track underneath the bridge.
WAGGA WAGGA STATION PRECINCT				
7	Brookong Avenue Footbridge	Footbridge	0.25	Footbridge replacement.
8	Edmondson Street Bridge	Road overbridge	4.34	Build a new bridge.
9	Mothers Bridge (Wagga Wagga Station Access Footbridge)	Footbridge	0.31	Footbridge replacement.
	Clearance Works	Structure clearances	3.54	Track slews and provision of signaling infrastructure and aerial cable clearances.
JUNEE STATION PRECINCT				
11	Kemp Street Bridge	Road overbridge	2.12	Build a new bridge that is tall enough to allow double-stacked freight trains to pass underneath
10	Junee Station Footbridge	Footbridge	0.94	Removal of derelict footbridge.
12	Olympic Highway Rail Underpass	Rail underpass		Replacement or modification of rail underbridge.
	Clearance Works	Signal structures		Track slews, drive access paths and provision of signaling infrastructure and aerial cable clearances.

The estimated number of enhancement sites are subject to further design and refinement. All works at all required enhancement sites and track slews, will be included in an approval process and described in the overarching Proposal EIS.

Track slewing includes:

Track Slew Site	From Chainage	To Chainage	Length (m) **	Extent of Slew
Illabo to Junee	465223	480710	15,487	Minor <300 mm
Junee located within the Junee Station Precinct	483650	485125	1,475	Minor <300 mm
Harefield	497521	498500	979	Minor <300 mm
Bomen	513440	514590	1,150	Major >300 mm
Wagga Wagga located within the Wagga Wagga Station Precinct	520680	521360	680	Major >300 mm
Uranquinty*	535100	537000	1,900	Minor <300 mm
Yerong Creek	564500	565700	1,200	Major >300 mm
Henty	580096	580750	654	Major >300 mm
Culcairn	596344	596818	474	Minor <300 mm
Albury located within the Albury Station Precinct	645460	646613	1,153	Major >300 mm

**An ephemeral watercourse (Sandy Creek) intercepts the Uranquinty Track Slew Site. Transom Bridge will likely require replacement to accommodate this track slewing. It is likely that this watercourse provides important seasonal ecosystem function for local biodiversity.*

*** For the purposes of this assessment, we have assumed that the Slew Sites cover the entire width of railway corridor and will include provision of aerial cable clearances and laydown areas. In many cases the track slewing will be carried out on both tracks and where required the track sidings, loops and lanes associated with slew sites may be modified consistent with ARTC design.*

TOTAL TRACK SLEW INVESTIGATION AREA – 26 km

The estimated length and width of track slew sites are subject to further design and refinement.

Other proposed works included within the Proposal are:
- Raising or replacement of 14 signal gantries;
- Relocation of power poles and other infrastructure to a safe distance from the track; and
- Modification of station buildings and structures as required.

Subject to further feasibility analysis and design definition, the following will form part of the A2I proposal and, if so, will be assessed in the EIS:
- No new culverts will be constructed. The existing culverts will be upgraded where necessary to comply with design specifications. Flood immunity, afflux and scour performance will not be compromised;
- Upgrade the turnouts in enhancement sites not able to support trains moving at 80km/hr;
- Permanent and temporary changes to the road network at public level crossings for signaling, stock movement, utilities at level crossings in enhancement areas;
- Replacement and/or modification to ten rail underbridges, ten overbridges/footbridges

within enhancement sites only;
- Mobile batch plants, located within ancillary facilities and in the rail corridor;
- Construction water supply and storage; and/or
- Existing rail sidings will remain where near a crossing loop, a new siding may be required if a new crossing loop is required within the rail corridor.

Additional information is provided in Attachment 2 – Biodiversity Assessment Report. The key terms used throughout this referral and the attached Biodiversity Assessment include:

Proposal site:	all areas within the railway corridor extending between Albury to Illabo in NSW.
Enhancement Locations:	discrete sites within the A2I Proposal site that are proposed for infrastructure enhancement. This includes the 12 key enhancement sites as well as 14 signal gantries. Enhancement works at each of these discrete work sites may include raising, widening or replacing bridges, raising or replacing signal gantries, and lowering sections of track.
Locality:	refers to an area within a 10 km buffer around the A2I Proposal site.
Slew Sites:	Track slewing to provide horizontal clearance is required along selected sections of the Proposal site.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Point	Area	Latitude (South)	Longitude (East)
1	Murray River Bridge	35.9717	141.4624
2	Albury Station	36.0833	146.9299
3	Culcairn Station	35.6673	147.3679
4	Wagga Wagga Station	35.1204	147.3679
5	Pearson St Bridge Wagga Wagga	35.126	147.3436
6	Junee Station	34.87	147.5839
7	Kemp St, Junee	34.875	147.5827
8	Illabo Silo	34.8162	147.7388
9	Illabo start	34.7992	147.7733

1.4 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

The Albury to Illabo proposal is shown in Attachment 1. The existing A2I alignment allows the rail infrastructure to be relocated at the enhancement locations defined above.. The Proposal includes a broad corridor to allow for an optimal alignment to be further refined during the design process. The Proposal commences in Albury NSW. The southern end of the Proposal commences at the Murray River Rail Bridge at approximately 648.500 km on the line, measured from Central Railway Station, Sydney. The Proposal then follows the existing rail corridor north for 185 km following the Main South line. Stations located along the track include the Albury, Bomen, Culcairn, Henty, The Rock, Uranquinty, Wagga Wagga and Junee Stations.

The Proposal crosses the Albury, Greater Hume, Lockhart, Wagga Wagga and Junee local government

areas (LGAs). The five LGAs are predominantly rural with the main local industries based around agriculture. The region produces fruit and vegetables crops as well as wheat, rice and livestock farming.

Sections of the Proposal are located within built-up urban areas, the most significant sections being Albury and Wagga Wagga. Junee is also noted as being a small urban centre. Other small villages include Gerogery, Culcairn, Henty, Yerong Creek, The Rock, Uranquinty, Bomen, and Illabo as detailed below:

- Albury is a major regional city located at the southern end of the Proposal. It lies on the northern side of the Murray River at the edge of the NSW/Victorian border. It is the major retail, commercial, administrative and cultural centre for the region and at the 2016 census Albury had an urban population of 47,974.

- Gerogery is in the Greater Hume Shire local government area. This small town serves a rural farming community, which at the 2016 census had a population of 565. It is located on the Olympic Highway, 30 km north of Albury and 95 km south of Wagga Wagga.

- Culcairn is in the Greater Hume Shire local government area. At the 2016 census, this small town had a population of 1,473. It is located on the Olympic Highway, 50 km north of Albury and 78 km south of Wagga Wagga. Industries include steel fabrication, a concrete plant, Country Energy Depot, substantial grain silos and the Wet Blue Hide facility.

- Henty is in the Greater Hume Shire local government area. At the 2016 census, this small town had a population of 1,237. It is located on the Olympic Highway, 67 km north of Albury and 61 km south of Wagga Wagga.

- Yerong Creek is the oldest village in the Lockhart Shire and was first settled in the 1870's. At the 2016 census, this small town had a population of 352. It is located on the Olympic Highway, 82 km north of Albury and 46 km south of Wagga Wagga.

- The Rock is in the Lockhart local government area. At the 2016 census, this small railway town had a population of 1,236. It is located on the Olympic Highway, 98 km north of Albury and 31 km south of Wagga Wagga.

- Uranquinty is located on the Olympic Highway, 112 km north of Albury and 16 km south of Wagga. It is located within the Wagga Wagga local government area. At the 2016 census, this small town had a population of 909 and was originally used as the railway village when the railway line was being built from Wagga Wagga to Albury.

- Wagga Wagga is the largest inland city within NSW and is located within the centre of the Proposal area. It is an important agricultural, military, and transport hub. The city sits halfway between the largest cities in Australia, being 452 km southwest of Sydney and 456 km northeast of Melbourne. At the 2016 census, Wagga had an urban population of 48,263.

- Bomen is a northern suburb of Wagga Wagga with a population of just 25 (at the 2016 census). It is located 9 km north of Wagga Wagga and 28 km south of Junee.

- Junee a medium-sized town in the Riverina region. The economy is based on a combination of agriculture, rail transport, light industry and government services, and in particular correctional services. It is located on the Olympic Highway, 37 km north of Wagga Wagga and 53 km south-west of Cootamundra. At the 2016 census, Junee had a population of 4,922.

- Illabo is a small town located at the northern end of the proposal, 16 km north east of Junee and 32 km south west of Cootamundra. At the 2016 census, Illabo had a population of 144.

The land requirement for the Inland Rail will comprise a corridor with an average width of 50 metres (m), with some variation to accommodate particular infrastructure and to cater for local topography. Private land acquisition is not expected as all of the key enhancement sites are located within the rail corridor however if required to accommodate the proposed infrastructure and/or the relocation of any utilities it will be considered during the EIS process. Some site access would be via private land, permission from the landowner would be sought where required.

1.5 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

The twelve Enhancement Site Areas cover an area of approximately 38 hectares (ha).

The track slew sites extend for 26 km along the rail corridor.

The development footprint will be defined in the EIS.

1.6 Is the proposed action a street address or lot?

Multiple Lots

1.7 Primary Jurisdiction.

New South Wales

1.8 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

Yes

1.8.1 Please provide details.

The Inland Rail program has been allocated funding from the Australian Government in mid-2016 to progress planning approvals and commence land acquisition.

1.9 Is the proposed action subject to local government planning approval?

No

1.10 Provide an estimated start and estimated end date for the proposed action.

Subject to State planning approval construction is planned to commence in mid-2023 and will be completed by late 2024. Operations to commence in 2025.

1.11 Provide details of the context, planning framework and State and/or Local government requirements.

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) establish a framework for the assessment and approval of developments in NSW. They also provide for the making of environmental planning instruments, including state environmental planning policies (SEPPs) and local environmental plans (LEPs), which determine the permissibility and approval pathway for development proposals and form a part of the environmental assessment process.

The proposal is subject to environmental assessment under Part 5 of the EP&A Act through the effect of Part 3 Division 15 of *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP). ARTC is defined as a public authority for rail infrastructure developments in accordance with clause 277(1) of the EP&A Regulation. The capital investment value of the proposal is estimated to be in excess of $50 million, and as a result the proposal is State Significant Infrastructure (SSI) under *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). The proposal requires approval from the NSW Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. The EP&A Act provides for SSI projects essential to the State to be declared as “Critical SSI”.

An SSI application will be submitted to the NSW Department of Planning, Industry and Environment (DPIE) seeking to have the Proposal assessed under Division 5.2 of the EP&A Act. If the proposal is a controlled action, it is anticipated that assessment will follow under the assessment bilateral agreement between the NSW and Commonwealth governments. If the proposal is a controlled action and the bilateral agreement does not apply, then ARTC requests that the Proposal be assessed by means of an EIS under Division 5.2 of the EP&A Act as an accredited assessment process under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The potential impact of the proposal on threatened species and communities listed under the *NSW Biodiversity Conservation Act* 2016 (BC Act) and the EPBC Act will be considered as part of the EIS.

Should the proposal be approved under the EP&A Act, Section 5.23 of the EP&A Act provides that a number of additional approvals, permits or licences that would otherwise be triggered for development in NSW are not required for an approved SSI (including critical SSI) project. However, in accordance with section 5.24 of the EP&A Act the following NSW approvals would still be required:

- An Environment Protection Licence (EPL) under Chapter 3 of the Protection of the Environment Operations Act 1997.
- Consent under section 138 of the Roads Act 1993.

1.12 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.

Consultation and community engagement has occurred since the feasibility stage including general Inland Rail briefings provided to the community and Councils in the proposal area with community drop in session dating back to July 2016. Between March 2016 and November 2018 further targeted consultation focused on the enhancement sites and communities in Junee, Wagga Wagga, Albury, Henty, Illabo and Culcairn.

The A2I proposal team focused on concept and reference design consultation with members of the community, adjacent residents and heavy/regular users of the enhancement sites such as nearby schools. This consultation included the use of communication tools such as; face to face (F2F) meetings with industry and councils, Information stands, door knock and letter drop to nearby residents, calls, emails, 1800 number and community information emails, media releases, community group presentations, briefings with local Councils and neighbourhood drop in sessions.

This approach was used to provide diverse and flexible opportunities for stakeholders and members of the community to seek an understanding of the proposed works, clarify questions and provide valuable feedback to incorporate into final design, construction planning and the development of mitigation management measures. In summary, the following community engagement activities were undertaken:

- 11 Sep 2018 Community drop in sessions for neighbourhood around Kemp Street bridge, held at Endeavour Park, Junee, 40 people;
- 12 Sep 2018 Community drop in sessions for neighbourhood around Olympic Hwy underpass, held at Ben Martin Park, Junee, 23 people;
- 13 Sep 2018 Community information booth in front of Junee Newsagency, 33 people;
- 13 Sep 2018 Community drop in sessions for neighbourhood around Edmondson Street, held at Railway Street, Wagga Wagga, 35 people;
- 18-20 Sep 2018 Community information booth at Henty Machinery Field Days;
- 24 Sep 2018 Community drop in sessions for Albury, held at QEII Square, Dean St, 45 people;

- 25 Sep 2018 Community information booth in Wagga Wagga Marketplace, 95 people;
- 11 Oct 2018 Community information booth at Illabo show at the showground 90 people;
- 27 Oct 2018 Community information booth at Junee Show at the showground, 300 Inland Rail bags given out, >200 people spoken too, >50 feedback forms received;
- 1 Dec 2018 Culcairn Community Information Session, 50 people;
- - 3 Nov 2018 Community information booth at Albury show, 28 feedback forms received;
- 27 July 2019 Community information booth at Wodonga Farmers Market, 75 people;
- 7 Aug 2019 Presentation to Junee Business and Trades Association, 14 people; and
- 7 Aug 2019 Presentation to Hume Group Country Women's Association (CWA) in Junee, 36 people.

Further consultation and communications have been scheduled for 2020 to further understand issues and to plan for construction, undertake visual amenity assessments, and to provide feedback to those already consulted and a clear understanding of next steps. The results of the stakeholder consultation will be documented in the EIS.

Please refer to (Attachment 3) for the Engagement Implementation Plan Albury to Illabo (A2I). Representatives from Aboriginal stakeholder groups the Wagga Wagga Aboriginal Land Council and Albury Aboriginal Land Council, have been contacted as part of the engagement processes within the A2I Engagement Implementation Plan. Aboriginal stakeholder requirements will be detailed in the EIS.

1.13 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

Commonwealth Legislation

Under the EPBC Act a referral is required to the Commonwealth for proposals, or 'actions', that are likely to have a significant impact on a matter of national environmental significance (MNES) or the environment on Commonwealth land. An approval from the Commonwealth Minister for the Environment may be required for a referred project. If so, that project is a controlled action under the EPBC Act.

The proposed action is not on any Commonwealth land, and ARTC does not believe the proposed action will have any significant impact on the environment on any Commonwealth land.

This EPBC Act referral has been formed to seek a determination on whether the impacts of the proposed action are likely to be significant and whether the proposed action is a controlled action requiring approval under the EPBC Act. ARTC's preliminary view is that the proposed action is not a controlled action, because it is unlikely to impact on threatened species, populations or ecological communities which are listed under the EPBC Act. Noting there is already an existing impact associated with the existing rail line, so the focus of the impact assessment is on any additional impacts associated with the Proposal.

Should the Minister determine that the proposed action is a controlled action, it is anticipated that the bilateral agreement between the New South Wales and Commonwealth Governments under the EPBC Act will apply and will allow the Commonwealth Minister to rely on the SSI assessment process under the EP&A Act as the assessment for the purposes of the EPBC Act. If the proposal is a controlled action and the bilateral agreement does not apply, then ARTC requests that the Proposal be assessed by means of an EIS under Division 5.2 of the EP&A Act as an accredited assessment process under the EPBC Act.

State Legislation

An SSI application will be submitted to DPIE seeking to have the proposal assessed under Part 5 Division 5.2 of the EP&A Act. In addition, ARTC is seeking to have the proposal declared Critical State Significant Infrastructure (critical SSI) under Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011*.

Following receipt of the Secretary's Environmental Assessment Requirements (SEARs) from DPIE an EIS will be prepared in accordance with the requirements of the EPBC Act and NSW EP&A Act that will assess the potential impacts associated with the proposal and identify measures to avoid, minimise and manage the potential impacts. While the risk of significant impacts is considered unlikely, the potential impact of the Proposal on threatened species and communities listed under the BC Act will be considered as part of the EIS in accordance with the EP&A Act. Given that significant impact on threatened species is unlikely within the already highly disturbed operational alignment, ARTC will seek a determination from the Secretary under section 7.9(2) of the BC Act. If such a determination is made, the impacts to threatened species will still need to be considered in the EIS, however it will not require the preparation of a Biodiversity Development Assessment Report (BDAR). In addition, Section. 7.14 of the BC Act, would not apply.

1.14 Is this action part of a staged development (or a component of a larger project)?

No

1.15 Is the proposed action related to other actions or proposals in the region?

Yes

1.16.1

As noted in section 1.2, the Inland Rail Program consists of 13 separate proposals. The Albury to Illabo Proposal presented here is one of the 13 separate proposals in the Inland Rail program.

Of those 13 proposals, those that are located in proximity to the Albury to Illabo Proposal are the Tottenham to Albury (T2A) proposal to the south (within Victoria) and Illabo to Stockinbingal (I2S) proposal to the north.

The Albury to Illabo Proposal connects to the existing rail line south of Albury along the Victorian and NSW border and the Illabo to Stockinbingal greenfield project, with tie-in points designed to enable the Proposal to proceed and be operated independently of the Tottenham to Albury and Illabo to Stockinbingal proposals, if required. These proposals are shown in Attachment 1.

The Illabo to Stockinbingal proposal was declared a controlled action by the Department of Environment and Energy and is currently subject to environmental assessment under the EP&A Act and EPBC Act.

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

No

2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

No

2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes, noting there is already an existing impact associated with the existing rail line, the focus of the impact assessment below is on any additional impacts associated with the proposal.

2.4.1 Impact table

Species	Impact
Superb Parrot (*Polytelis swainsonii*)	Several Superb Parrot individuals were observed within the A2I Proposal site on two (2) occasions (refer to Figures 6 and 7 in Attachment 2). The individuals were all recorded in non-remnant vegetation patches with sporadic *Eucalyptus albens* individuals. Although, the A2I Proposal site is predominately cleared and absent of woody vegetation, there are many areas that contain intermittent Eucalyptus individuals (e.g. E. *camaldulensis, E. melliodora and E. blakeyi*) with a grassy understory which provides suitable foraging habitat for Superb Parrots. This species is known to inhabit White Box-Yellow Box-Blakely's Red Gum Grassy Woodlands, which was present at several locations within the A2I Proposal site (total 0.45 ha) within the Proposal site). Patches of regrowth *Acacia dealbata* may also provide some limited foraging resources. The species is not considered to forage on the ground within the disturbed or open sections of rail corridor itself given the absence of *Danthonia caespitosa and Critesion spp*. The species is not known to breed within the Proposal site although a small number of hollow bearing trees were recorded during the field survey at the Pearson Street Bridge - Enhancement Site 6, Bomen Track Slew Site and the Junee to Illabo Track Slew Site. Known breeding sites are reported to occur along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. This species most likely flies over the Proposal site to access adjacent more suitable habitat in the locality. The removal of occasional foraging habitat is not considered to significantly impact the species although this will be the subject of additional assessment to support the EIS.
Sloane's Froglet (*Crinia sloanei*)	The species may occasionally occur in the non-native grasslands within the Proposal site, which hold water as puddles following rain events, although the ongoing maintenance regimes would reduce the viability of these habitats and the potential for breeding within the corridor is low. The Proposal is unlikely to result in any significant impact on this species.

Species	Impact
Grey-headed Flying-fox (*Pteropus poliocephalus*)	This species may occasionally forage in the three patches of Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (PCT 277) and the scattered trees along the length of the Proposal site. The removal of this occasional foraging habitat is not considered likely to significantly impact the species, as it is less than 1 ha of potential foraging habitat. Indirect impacts including train strike (based on increased height of the trains) are unlikely to significantly impact the species given the relatively low frequency of train traffic.
White-throated Needletail (*Hirundapus caudacutus*)	This migratory species is almost exclusively aerial whilst within Australia and the removal of the three patches of Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (PCT 277), scattered trees (less than 1 ha) and non-native grassland along the length of the Proposal site is not considered to significantly impact the species. Indirect impacts including train strike (based on increased height of the trains) is unlikely to significantly impact the species.
Hoary Sunray (*Leucochrysum albicans var. tricolor*)	This species may be present in the Proposal site where chemical spray does not occur and mowing is infrequent. The removal of these small areas of low quality habitat is not considered to significantly impact the species.
Macquarie Perch (*Macquaria australasica)*	Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury/Nepean and Shoalhaven catchments. Considering the species is within the distribution as specified by NSW Department of Primary Industries and that the suitable habitat exists, this species has the potential to occur within the A2I Proposal site. Any waterway crossings will need to consider an appropriately designed structure that does not obstruct fish passage and will be designed in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management and the Policy and Guidelines for Fish Friendly Waterway Crossings. The Proposal is not considered to significantly impact the species in the long term although this will be the subject of additional assessment to support the EIS.

2.4.2 Do you consider this impact to be significant?

Noting there is already an existing impact associated with the existing rail line, the additional impacts of the Proposal are unlikely to be significant on those species listed in the table above although this will be the subject of additional assessment to support the EIS.

The impact to potential habitat areas across the entire Proposal site is less than 1 ha based on the identification of 0.45 ha of BC Act listed White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) and <0.5 ha of isolated and regrowth woodland trees. All areas of Box Gum Woodland Threatened Ecological Community (TEC) will be avoided during detailed design and will be clearly

delineated in the field and on all construction drawings as a no go zone. These patches are not considered White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC as listed under the EPBC Act as they do not meet the condition criteria. Specifically, they do not contain a predominantly native understorey and field survey confirmed less than 50% native species in the ground layer. There are no outstanding natural features or unique values within the Proposal site.

Further management and mitigation measures will be detailed in the EIS.

Refer to the attached Biodiversity Assessment report (Attachment 2).

2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?

Unlikely. The White-throated Needletail (*Hirundapus caudacutus*) is almost exclusively aerial whilst within Australia and the removal of the three patches of Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (PCT 277), scattered trees (less than 1 ha) and non-native grassland along the length of the Proposal site is not considered to significantly impact the species.

Indirect impacts including train strike (based on increased height of the trains) is unlikely to significantly impact the species which occur at great elevations, often at heights of a hundred metres or so.

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

No

2.7 Is the proposed action to be taken on or near Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No

2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to have ANY direct or indirect impact on any part of the environment in the Commonwealth marine area?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

A copy of the Biodiversity Assessment Report is provided in Attachment 2.

Rapid Biological Values Assessments were undertaken at each of the Enhancement Sites, Trackside Structures and Track Slew Sites between 26 August 2019 and 29 August 2019. The purpose of the Rapid Biological Values Assessments was to identify important biological values within the A2I Proposal site including:

- The presence of threatened fauna and flora species;
- Threatened ecological communities; and
- Habitat and resources considered important for threatened species or ecological communities.

Survey methodologies were designed to rapidly assess biodiversity values and were not undertaken in accordance within the BAM. No detailed riparian and aquatic habitat assessments have been completed to date.

A total of 52 birds species, two (2) mammal species, zero (0) reptiles and three (3) amphibian species were recorded during the August 2019 Rapid Biodiversity Assessments. Fauna species were identified opportunistically throughout these assessments noting that no targeted surveys were undertaken.

Birds

A combined total of 52 bird species were identified during the August 2019 survey.

Birds were recorded in a variety habitats including, the railway corridor, dams, riparian corridors, woodlands, urban environments, gardens, non-native grasslands and shrublands. Two (2) cup shaped nests and 21 mud nests were identified within the A2I Proposal site.

Bird diversity was greatest within the very limited areas of woody vegetation and aquatic habitats. Adjacent areas of larger, more intact woodlands were also noted to contain a high diversities of birds which may utilise the resources present within the rail corridor occasionally as a small part of a large home range.

No EPBC listed Migratory species were identified during the field surveys. Eight (8) EPBC Marine Species were identified during the field surveys. The A2I Proposal site is not located or likely to impact any Commonwealth Marine Protected Areas. Therefore, an impact assessment under the EPBC Act of these Marine Species is not warranted.

One (1) species of conservation significance was identified during the field surveys, which was the Superb Parrot (*Polytelis swainsonii*). A total of six (6) Superb Parrot individuals including both females and males were detected within and immediately adjacent to the A2I Proposal site. Five individuals were detected within 250m of the Harefield Track Slew Site and one (1) individual was detected in the Illabo to Junee Track Slew Site. Refer to the attached Biodiversity Assessment for additional information.

Five (5) bird of prey species were identified during the surveys, which included the Collared Sparrowhawk (*Accipiter cirrocephalus*), Brown Goshawk (*Accipiter fasciatus*), Brown Falcon (*Falco berigora*), Nankeen Kestrel (*Falco cenchroides*) and Black Kite (*Milvus migrans*).

Nine (9) parrot species were detected during the surveys, which included the Sulphur-crested Cockatoo (*Cacatua galerita*), Galah (*Eolophus roseicapilla*), Eastern Bluebonnet (*Northiella haematogaster*), Cockatiel (*Nymphicus hollandicus*), Crimson Rosella (*Platycercus elegans*), Eastern Rosella (*Platycercus eximius*), Red-rumped Parrot (*Psephotus haematonotus*), Superb Parrot (*Polytelis swainsonii*) and Rainbow Lorikeet (*Trichoglossus moluccanus*).

Nine (9) wetland species were detected during the surveys, which included the Pacific Black Duck (*Anas superciliosa*), Australian Wood duck (*Chenonetta jubata*), White-faced Heron (*Egretta novaehollandiae*), Little Pied Cormorant (*Microcarbo melanoleucos*), Little Black Cormorant (*Phalacrocorax sulcirostris*), Purple Swamphen (*Porphyrio porphyrio*), Australian White Ibis (*Threskiornis moluccus*) and Straw-necked Ibis (*Threskiornis spinicollis*).

Mammals

Two (2) mammal species were detected within the A2I Proposal site during the August 2019 field visit. The Eastern Grey Kangaroo (*Macropus giganteus*) and European Rabbit (*Oryctolagus cuniculus*) were observed on several occasions. In addition to these species, there was secondary evidence of other mammal species (ie. scratch marks on trees) within the A2I Proposal site and a network of European Rabbit (*Oryctolagus cuniculus*) burrows was found.

Herpetofauna

Zero (0) reptiles and three (3) amphibian species were recorded during the August 2019 Rapid Biodiversity Assessments. Amphibians included the Eastern sign-bearing Froglet (*Crinia parinsignifera*), Common Eastern Froglet (*Crinia signifera*) and the Spotted Marsh Frog (*Limnodynastes tasmaniensis*).

Introduced Fauna

Five (5) invasive fauna species were identified during the August 2019 Rapid Biodiversity Assessments. These included the Rock Dove (*Columba livia*), House Sparrow (*Passer domesticus*), Spotted Dove (*Spilopelia chinensis*), Common Starling (*Sturnus vulgaris*) and the European Rabbit (*Oryctolagus cuniculus*).

The Common Starling, House Sparrow and Rock Dove were identified at the majority of the A2I Proposal site and were among the most commonly sighted bird species. These three (3) species are likely compete with native species for resources and habitat.

Flora

The vast majority of the A2I Proposal site is within the existing rail corridor and is subject to regular rail maintenance activities (e.g. mowing and herbicide treatment), track developments and influences from surrounding agriculture, industrial and urban areas.

This ongoing disturbance has resulted in the A2I Proposal site being almost exclusively non-remnant vegetation characterised predominately by non-native grasslands. Exotic flora and invasive flora species were regularly found throughout the A2I Proposal site. Small pockets of riparian and semi-cleared open woodland persists in isolated pockets only.

A total of 38 flora species were identified within the A2I Proposal site. A full list of species recorded during the field surveys is provided in the attached Biodiversity Assessment. No threatened flora species were identified during the field surveys.

3.1 Describe the hydrology relevant to the project area (including water flows).

The Proposal is located within the Murray-Murrumbidgee catchment which is a sub-catchment within the Murray Darling Basin. It stretches from the Murray River, north to the Murrumbidgee River intersecting Wagga Wagga, and further north to Illabo remaining wholly within the Murray-Murrumbidgee catchment. The Proposal crosses two rivers (Murray River and Murrumbidgee River) and includes 21 creek crossings.

There are approximately 100 active river gauges within the Murrumbidgee catchment recording flows on a continuous basis. Many of the gauges located at major towns along the river have been established since the 1880s, including the gauge at Wagga Wagga. Although influenced by the regulation effects of upstream dams since 1928, long term flows at Wagga Wagga provide an insight into how runoff patterns in the Murrumbidgee catchment have varied over time. Daily streamflow's provide an indication of the variability of flow patterns and the peak height of flood events.

Groundwater is an important source of water for industry and agriculture in the Murrumbidgee catchment. The groundwater and surface water systems in the catchment have a range of connectivity which vary from being highly connected, with the relationship changing seasonally, to longer term variations or permanently disconnected. The interaction is influenced by surface and groundwater use, climate and flood frequency, significance and duration. Most upland streams in the catchment are hydraulically connected, receiving flow from fractured rock aquifers.

The region is characterised by low-lying floodplains which experiences regular inundation. Flooding likelihood is heavily concentrated along the Murray River, Murrumbidgee River, Billabong Creek and other local waterways. There have been several large flood events in Wagga Wagga, the largest of these being in 1891, 1925, the 1950s and 1974.

3.2 Describe the soil and vegetation characteristics relevant to the project area.

The vast majority of the A2I Proposal site is within the existing rail corridor and is subject to regular rail maintenance activities (e.g. mowing and herbicide treatment), track developments and influences from surrounding agriculture, industrial and urban areas. This ongoing disturbance has resulted in the A2I Proposal site being almost exclusively non-remnant vegetation characterised predominately by non-native grasslands.

Regrowth and mature *Eucalyptus melliodora*, *E. blakelyi*, *E. albens* and *E. camaldulensis* are ocassionally present throughout the Proposal Site as scattered individuals with some smaller patches of regrowth *Acacia dealbata* and *A. saligna* in minimal parts of the Proposal site. There are three patches of Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (PCT 277) present within the Proposal site at Wagga Road Bridge, Ettamogah.
Where the proposal makes use of existing rail facilities, there is potential for contamination resulting from existing operations (e.g. spills and leaks from trains). There is also potential for contamination to be present associated with agricultural activities (crop / pasture spraying, dip sites and chemical / fuel storage). It is considered unlikely that unknown significant contamination would be encountered during construction.

3.3 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.

The three patches of Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (PCT 277) present within the Proposal site at Wagga Road Bridge are consistent with White Box Yellow Box Blakely's Red Gum Woodland Threatened Ecological Community (TEC) as listed under the BC Act and will be avoided during detailed design.

These patches are not considered White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC as listed under the EPBC Act as they do not meet the condition criteria. Specifically, they do not contain a predominantly native understorey and field survey confirmed less than 50% native species in the ground layer. These three patches are considered moderately disturbed

containing mature Blakely's Red Gum, Yellow Box and White Box to 16 metres in height with a largely absent shrub layer and a ground cover layer dominated by non-native species.

There are no outstanding natural features or unique values within the Proposal site.

3.4 Describe the status of native vegetation relevant to the project area.

The three patches of Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion (PCT 277) present within the Proposal site at Wagga Road Bridge are considered to be the White Box Yellow Box Blakely's Red Gum Woodland Threatened Ecological Community (TEC) as listed under the BC Act. These patches are within the NSW South Western Slopes Bioregion and are likely to respond to assisted natural regeneration and will be avoided during detailed design.

These three patches are not considered White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC listed under the EPBC Act as they do not meet the condition criteria.

3.5 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

A desktop assessment of Topographic Mapping revealed that the northern section of the proposal, from Illabo primarily passes through level farming land towards undulating terrain around Wagga Wagga.

The central part of the proposal between Henty and Wagga Wagga generally passes through gently sloping to level farming land, however the proposal traverses a valley, at The Rock, between two uplifted hills (The Rock Hill and Flowerpot Hill), before returning through undulating terrain around Wagga Wagga.

The southern part of the proposal from Albury to Henty generally passes through flat plains at Albury towards gentle sloping and level farming land moving north towards Henty.

3.6 Describe the current condition of the environment relevant to the project area.

The current condition of the environment within and adjacent to the Proposal site is considered to be poor due to high levels of disturbance. Native vegetation clearing and earthworks has occurred throughout the Proposal site to construct the rail line. Vegetation within the Proposal site is maintained through chemical spray, mowing and chainsaws to allow for the safe operation of the rail line. The dominant vegetation within the Proposal site is non- native grassland with minimal scattered eucalypts and three small patches of moderately disturbed Box-Gum Woodland present. The Proposal site also contains access tracks and rail infrastructure constructed along the rail line. The land adjacent to the Proposal site is largely agricultural with cropping and sheep grazing dominating. There are also townships with urban areas at some locations within the Proposal site.

3.7 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

To identify Non-Aboriginal heritage constraints surrounding the Proposal site, the following statutory registers were searched:

- NSW State Heritage Register (SHR)
- Junee Local Environmental Plan 2012
- Wagga Wagga Local Environmental Plan 2010
- Lockhart Local Environmental Plan 2012
- Greater Hume Local Environmental Plan 2012
- Albury Local Environmental Plan 2010

- Australian Rail Track Corporation Section 170 Heritage Register.

Preliminary searches of these registers identified 102 Non-Aboriginal Heritage sites within or adjacent to the Proposal site. None of these are listed as Commonwealth Places.

Based on the results of the statutory register searches it has been identified that the Proposal would have potential to result in impacts to known heritage sites. Impacts may include:

- Temporary visual impacts;
- Long-term visual impacts;
- Removal of significant items such as the footbridges;
- Dust and vibration impacts; and
- Permanent modification of significant items or works. This includes the potential trimming of the awning at Bomen Railway Station.

Statement of Heritage Impact (SoHI) reports will be prepared for all sites to be impacted and will be used to determine the need for local planning approvals or permits under Section 60 of the NSW Heritage Act, relating to SHR items.

3.8 Describe any Indigenous heritage values relevant to the project area.

A preliminary assessment of Aboriginal heritage has been undertaken for the proposal. The assessment included database searches and a review of previous archaeological investigations. A total of 11 NSW Aboriginal Heritage Information Management System (AHIMS) searches were undertaken across the length of the Proposal site, identifying 383 Aboriginal heritage sites. Of these 383 sites, 14 are within or in close proximity (<200 m) to the Proposal.

The sites consist of Artefacts (isolated finds or scatters), some with associated areas of Potential Archaeological Deposit (PAD), and culturally modified trees. All sites are recorded as being 'Valid' (i.e. intact), although aerial imagery indicates some of these valid sites may have been destroyed through development or construction. It is noted that several of the proposed track slews are situated within areas of high archaeological potential, as determined by predictive modelling and previous reporting, that may not have been subject to survey previously.

Based on the results of the AHIMS searches it has been identified that the Proposal would have potential to result in impacts to known Aboriginal heritage sites across the Proposal site. Impacts are likely to involve destruction or disturbance of sites and the EIS will include detailed consultation and archaeological assessment.

3.9 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

The Proposal occurs within a rail corridor, on land zoned for infrastructure and is owned by the NSW Government.

3.10 Describe any existing or any proposed uses relevant to the project area.

The Proposal is part of an interstate rail line through Victoria, NSW and south-east QLD. The Proposal is within the Albury to Illabo (A2I) section of Inland Rail and passes through the Albury town centre on the Victoria / NSW border and travels roughly north to north-east through Wagga Wagga and Junee in central south regional NSW until it reaches Illabo. The Proposal occurs within operational rail corridor and is land that is zoned as infrastructure owned by the NSW State Government.

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

At the time of referral, only preliminary information is available regarding measures to avoid or reduce impacts. Further baseline data, design information and confirmation of suitable management approaches will be developed in the next stage of the Proposal.

Design

All of the Proposals that are part of the Inland Rail program will be designed and assessed in a consistent way, guided by an overarching Environmental Strategy. Environmental assessment during the design phase will address design, construction and operational phase impacts and management measures. Detailed requirements for environmental assessment and design will also be specified in project tender documentation. This information is still under development, and will also incorporate any assessment requirements provided by the NSW and Australian governments, if relevant and available at the time of tender release.

Opportunities to minimise earthwork extents, avoid significant impacts to creeks and watercourses through sensitive design, avoid or reduce impacts to areas of sensitive habitat (including habitat loss, habitat fragmentation and mortality) will be key considerations throughout design. Opportunities to minimise amenity impacts (noise, air quality, visual) will also be key drivers of subsequent design processes.

Construction

A construction environmental management plan will be developed to ensure management and mitigation measures and conditions of approval are clearly documented, and are implemented during the construction phase of the proposal. This will include definition of no-go zones, requirements for post-works rehabilitation, and scheduling of works where necessary to minimise impacts during breeding periods or times of heightened environmental sensitivity.

Operation

ARTC has established an environmental process that applies to operations on its network. This includes an environmental policy, an environmental management system and a pollution incident response management plan.

In all its activities, ARTC commits to:

- Taking prompt action in response to non-compliance and other environmental complaints.
- Having effective relationships with all environmental agencies and regulators.
- Ensuring agreements between contractors and rail operators comply with its Environmental Management System; and
- Ensuring employees are inducted so they can perform their duties.

As the Proposal progresses, impact avoidance and reduction will remain key drivers in design development. Project-specific environmental management or monitoring requirements identified through future stages of design and impact assessment will be incorporated into the relevant operational management documentation.

These management and monitoring measures will be determined based on current guidelines and scientific knowledge, with input from relevant government agencies. At this stage of the process the exact nature of this documentation is yet to be determined, however the existing ARTC Environment Protection Licenses for operations in New South Wales and South Australia provide an example of how this is addressed in these jurisdictions.

The proposal's environmental outcomes should also be considered in the context of the overall intent and outcomes of the ultimate Inland Rail program. The establishment of a freight rail route that provides a reduction in truck journeys is expected to negate or delay the need for progressive upgrades of the National Highway and associated environmental impacts allowing repurposing of strategic funds for other purposes. This Proposal would contribute towards improved sustainability as well as reductions in carbon emissions which is anticipated through delivery of the Inland Rail program.

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

Yes

ARTC's Environmental Policy is attached. ARTC also operates an environmental management system and has a state based (NSW) Code of Practice for Environmental Impact Assessment of Development Proposals in NSW.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes

ARTC to provide updated list during the online submission process

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

DoEE (2019a) SPRAT: White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland. On-line resource accessed via: http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=43

ERM (2020) Inland Rail – Albury to Illabo Project (A2I) Biodiversity Assessment Report.

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.1 Select the relevant alternatives related to your proposed action.

The Albury to Illabo Proposal involves enhancement works at discrete locations to provide vertical and horizontal clearance for double stack containers to run between Albury to Illabo. For each of four sub-corridors considered in the 2010 study, which identified the 'Far Western Sub-Corridor' as the preferred alignment, two alternative routes between Melbourne and Junee were considered – via Shepparton or via Albury.

The alternate route ran from Mangalore via Shepparton, crossing the border at Tocumwal to Narrandera in the North and ran east to Junee. Much of the alternative route via Shepparton in Victoria required reconstruction of formations and full track construction, while the route via Albury is within an established and operable Class 1 freight rail line corridor.

The preferred Far Western Sub-corridor' route via Albury had the fastest transit time of 20.4 hours from Brisbane to Melbourne and a projected cost of $3.1 billion. The alternate 'Far Western Sub-corridor' had a transit time of 21.3 hours and a projected capital cost of $3.6 billion.

The Albury alternative had greater opportunity for improved transit time through new capital projects.

At each enhancement site that did not have the vertical and horizontal clearance required for double-stacked containers to safely pass along the Albury to Illabo route the following treatments were considered:

- lowering, widening or shifting the track
- raising or widening the bridges
- replacing the bridges.

Key considerations to determine whether track lowering was preferred/feasible at each site included:

- Topography (the feasibility of achieving design grade)
- Line of sight (safety)
- Operational issues such as safe egress onto platforms and associated infrastructure upgrades
- Hydrology and hydrogeology (propensity to track flooding, environmental impacts)
- Heritage values
- Ecological communities and vegetation
- Disruption to rail operations

Key considerations to determine whether Bridge replacement/modification/removal was preferred/feasible at each site included:

- Land availability/potential acquisition required
- Road / community disruption
- Grade requirements (*Disability Discrimination Act 1992* (DDA) requirements)
- Tie-in's with other roads and infrastructure
- Constructability complexity
- Heritage values

The key benefits associated with the A2I section of Inland Rail include:

- Utilising existing rail corridor and infrastructure to reduce costs and environmental and social impacts while supporting the benefits of delivering the project for Inland Rail more broadly;
- Based on feedback from the community, the designs for the Kemp Street Bridge and Edmondson Street Bridge replacements will incorporate shared walkways, with separation barriers providing a significant safety improvement;

- Modifying footbridges to make them compliant with the DDA, thereby improving accessibility for the community;
- Recording the heritage significance of heritage places and precincts; and
- Providing a shared pedestrian and cyclist path at road bridges.

8.27 Do you have another alternative?

No

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

ARTC to provide updated list during the online submission process

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

ARTC to provide updated list during the online submission process

9.6 Is the Referring Party an Organisation or Individual?

ARTC to provide updated list during the online submission process

Appendix A - Attachments

Attachment 1: Overview of the Inland Rail program

Attachment 2: Biodiversity Assessment Report

Attachment 3: Engagement Implementation Plan Albury to Illabo (A2I)

Attachment 4: ARTC Environmental Policy