






NARROMINE TO NARRABRI

State Significant Infrastructure
Application Report - Addendum

Document Control

DOCUMENT TITLE	STATE SIGNIFICANT INFRASTRUCTURE APPLICATION REPORT - ADDENDUM		
Prepared By	Angela Stewart		
Reviewed By	Matthew Errington and Andrew Skele		
	ENDORSED BY	ENDORSED BY	APPROVED BY
Name	Matthew Errington	Andrew Skele	Rebecca Pickering
Title	Senior Environment Advisor	Environment Manager – NSW	Director of Engagement, Environment and Property
Signature		 Andrew Skele (Apr 29, 2020)	 Rebecca Pickering (May 5, 2020)
Date	24/04/2020	<Insert date>	<Insert date>

Revision History

REVISION	DATE ISSUED	DESCRIPTION
A	31/03/2020	Draft
B	24/04/2020	Final

Disclaimer: This document has been prepared by ARTC for internal use and may not be relied on by any other party without ARTC’s prior written consent. Use of this document shall be subject to the terms of the relevant contract with ARTC.

ARTC and its employees shall have no liability to unauthorised users of the information for any loss, damage, cost or expense incurred or arising by reason of an unauthorised user using or relying upon the information in this document, whether caused by error, negligence, omission or misrepresentation in this document.

This document is uncontrolled when printed.

© Australian Rail Track Corporation Limited 2019

Table of Contents

1	Introduction.....	3
2	Overview of Proposal Features	3
2.1	Borrow Pits.....	3
2.1.1	Justification for Borrow Pits.....	8
2.2	Alignment Refinement.....	9
2.2.1	Justification for Alignment Refinement.....	9
2.3	Rail Connections	9
2.3.1	Justification for existing rail line connections	9
3	Existing Land Use	10
3.1	Borrow Pits.....	10
3.2	Alignment Refinement.....	10
4	Proposed Assessment Methodologies and EIS Content for the Borrow Pits	10
4.1	Air Quality	10
4.2	Biodiversity.....	11
4.3	Noise and Vibration.....	12
4.4	Traffic and Transport.....	13
4.5	Geology, Soils and Contamination	13
4.6	Aboriginal Heritage.....	14
4.7	Visual Amenity	14
4.8	Hydrology and Flooding	14
4.9	Surface Water and Groundwater.....	15

List of tables

Table 1:	Borrow Pits – Indicative Sizes	8
Table 2:	Borrow Pit Site Zoning and Land Use Details	10

List of figures

Figure 1:	Location of Proposal Features	4
-----------	-------------------------------------	---

1 Introduction

The Australian Rail Track Corporation (ARTC) submitted an application for a State Significant Infrastructure (SSI) project in accordance with Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979*, for the Narromine to Narrabri (N2N) Inland Rail Project in July 2018. On the 28 November 2018, the NSW Department of Planning, Industry and Environment (DPIE) (formerly known as Department of Planning and Environment) issued the Secretary's Environmental Assessment Requirements (SEARs) for the project.

In July 2018 when the SSI Application Report was lodged, the N2N Project was still in the concept design stage. Since then, refinement of the reference design has resulted in the following minor changes to the location/footprint of the proposal outside of the N2N Study Area (released in December 2017):

- ▶ Four borrow pits
- ▶ Alignment refinement at Black Hollow
- ▶ Provision for rail connections with existing rail lines

This Addendum to the SSI Application Report provides further information on these proposal features and their assessment in the Environmental Impact Statement (EIS), so that DPIE can provide updated SEARs for the N2N Project. Figure 1 shows these proposal features.

The proposal features associated with the borrow pit sites, alignment refinement and rail connections would not increase the impact of the proposal on Commonwealth Matters of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

2 Overview of Proposal Features

2.1 Borrow Pits

A borrow pit is an area located outside of the proposed rail corridor where material will be extracted for construction purposes. The material won from borrow pits will be used for the construction of the track formation.

The SSI Application Report identifies that borrow pits would form part of the proposal, however at the time of writing the number and location were unknown. The development of the reference design for the proposal has identified that while construction of the proposal may generate excess spoil, it is likely this spoil would be either unsuitable, or the haulage distances too great, to justify re-use in the track formation. Therefore, it is proposed to establish borrow pits for supply of general and structural fill.

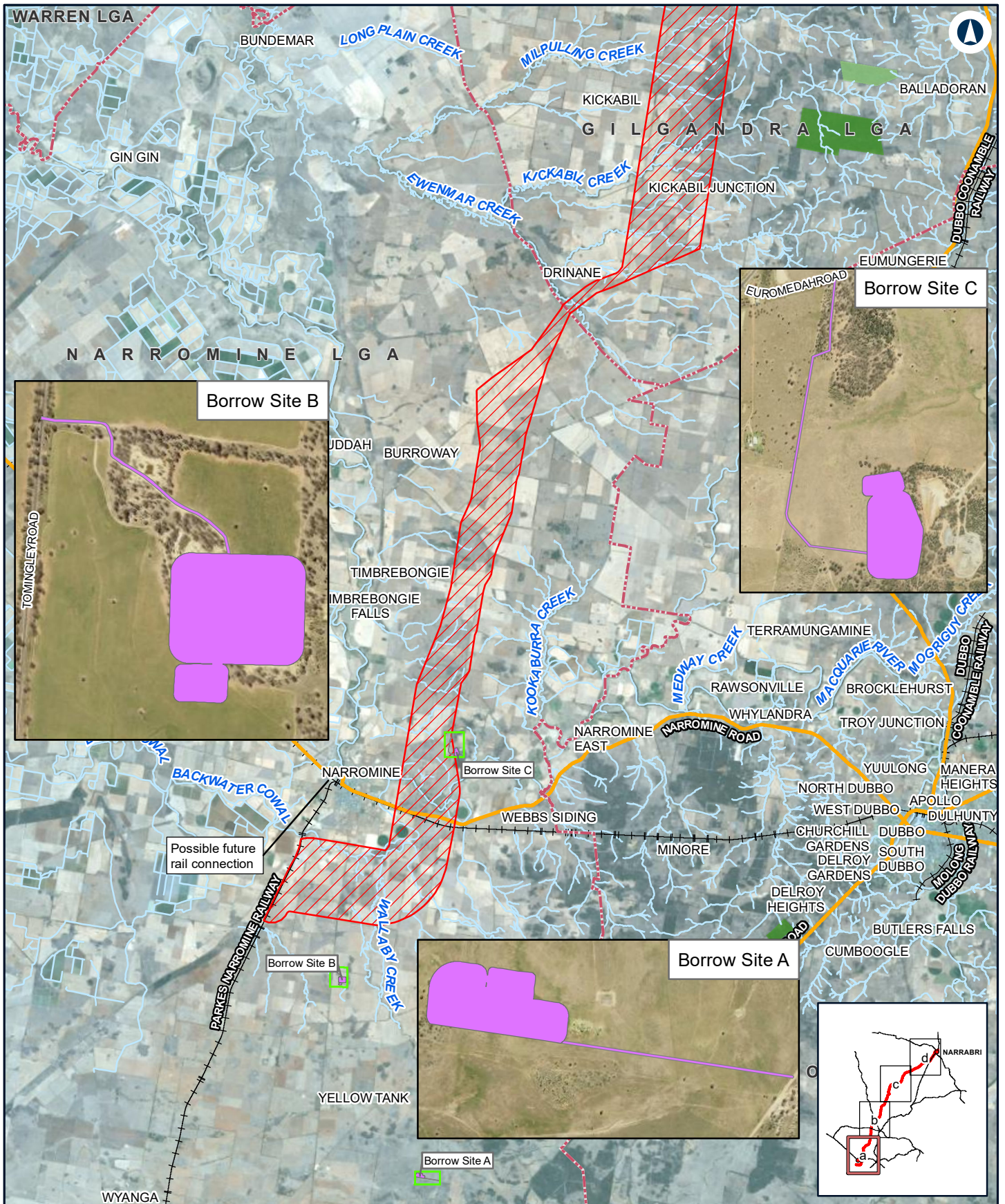
An Expressions of Interest (EOI) to local landholders was released in January 2019. The invitation outlined the following parameters:

- ▶ borrow pits containing suitable general fill material must be within 25km of the N2N Study Area
- ▶ competent rock – which can be used to produce ballast rock – was also be considered, from sites located up to 50km from the N2N Study Area.

Following the EOI, ARTC reviewed all submissions from interested parties and preliminary geotechnical investigations were conducted to identify suitable material. Following these investigations, four (4) essential borrow pit sites were identified to be most suitable for supply to the proposal.

Figure 1 shows the location of the borrow pits sites. The indicative volumes of fill to be excavated from each borrow pit is summarised in Table 1. These indicative volumes may not be excavated from all borrow pits, with final volumes likely to be lower in some subject to further geotechnical investigations during detailed design. As such, these indicative volumes represent the maximum potential size for each borrow pit.

Should the Construction Contractor require more general and structural fill from additional borrow pit sites, further planning approvals would need to be sought by them. Higher quality construction material such as ballast and capping would be sourced from offsite commercial quarries.



NARROMINE TO NARRABRI

Figure 1: Location of Proposal Features



LEGEND

- Phase 2 Study Area
- Local Government Area
- Railway
- Highway
- Watercourse
- Forestry reserve
- Conservation reserve
- Borrow Pit and Haul Road

Coordinate System: GDA 1994 MGA Zone 55

ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material.

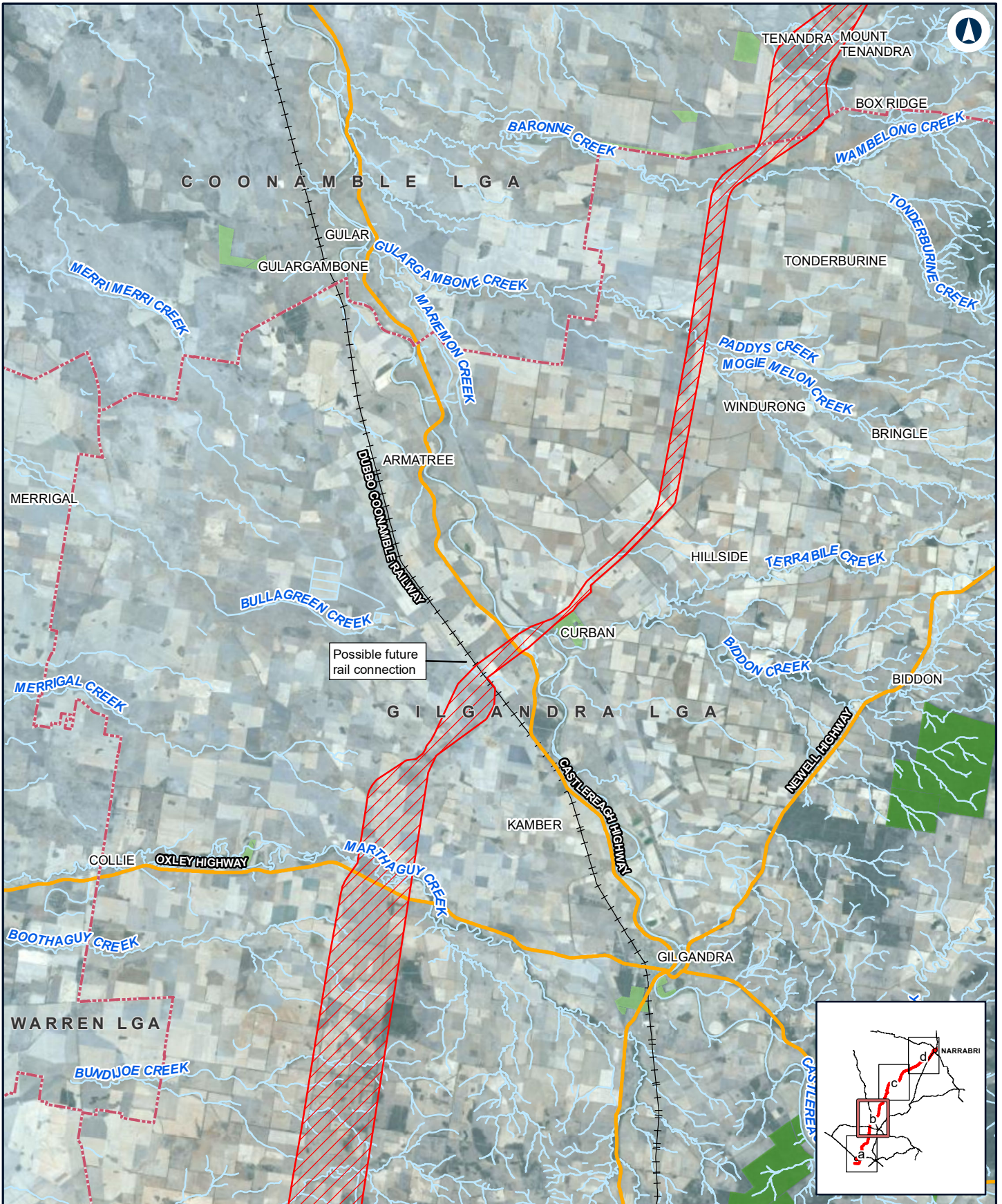
ARTC will not be responsible for any loss or damage suffered as a result of any person whatsoever placing reliance upon the information contained within this GIS map.

Date: 27/02/2020 Paper: A4
 Author: PK (GHD) Scale: 1:310,000

Data Sources: Aerial imagery, DCDB/DTDB: LPI, 2015; 250K Topographic Data Series 3: Geoscience Australia; All other layers; Jaco



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



NARROMINE TO NARRABRI

Figure 1: Location of Proposal Features



LEGEND

- Phase 2 Study Area
- Local Government Area
- Railway
- Highway
- Watercourse
- Forestry reserve
- Conservation reserve
- Borrow Pit and Haul Road

Coordinate System: GDA 1994 MGA Zone 55

ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material.

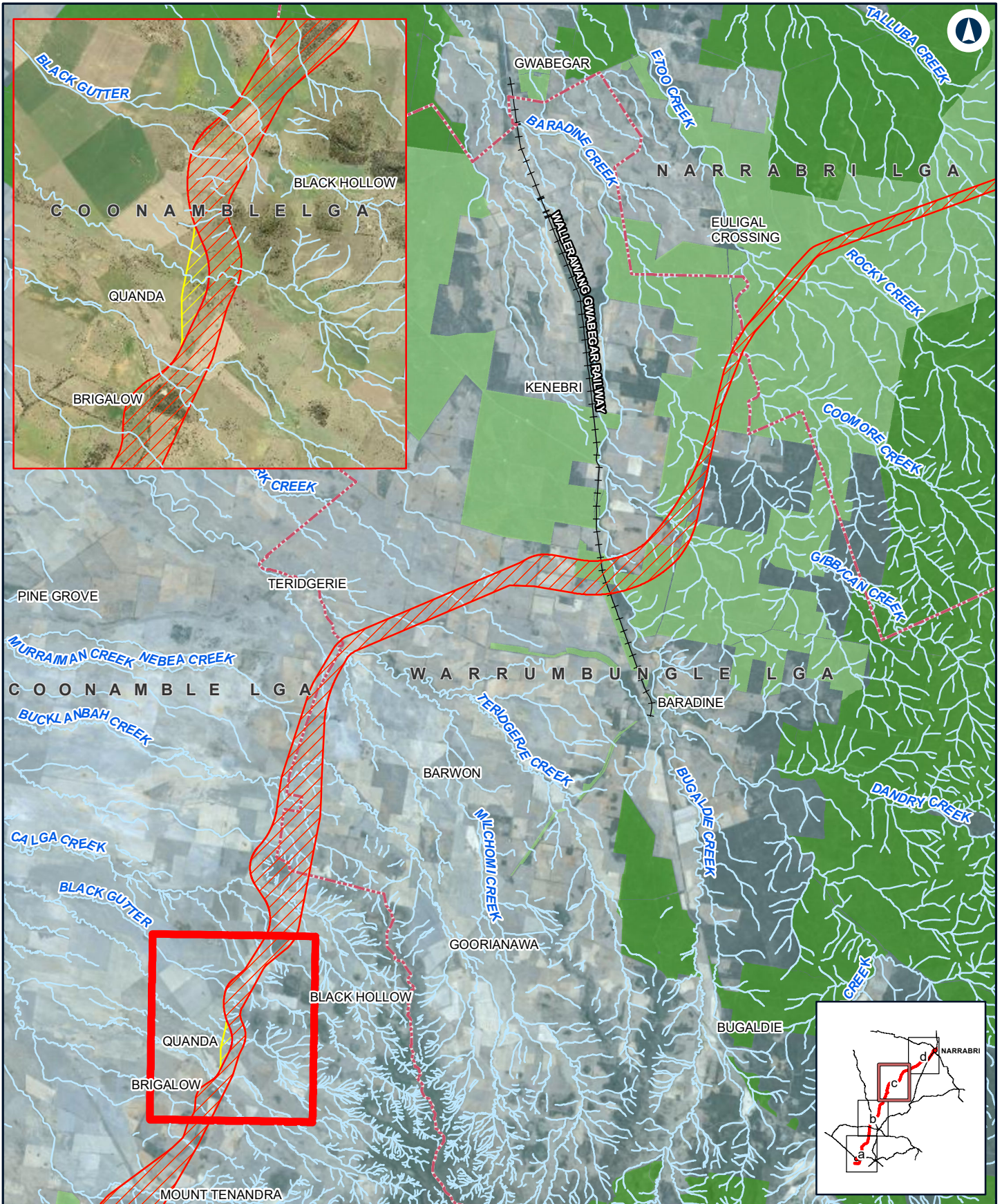
ARTC will not be responsible for any loss or damage suffered as a result of any person whatsoever placing reliance upon the information contained within this GIS map.

Date: 27/02/2020 Paper: A4
 Author: PK (GHD) Scale: 1:310,000

Data Sources: Aerial imagery, DCDB/DTDB: LPI, 2015; 250K Topographic Data Series 3: Geoscience Australia; All other layers; Jaco



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



NARROMINE TO NARRABRI

Figure 1: Location of Proposal Features



Coordinate System: GDA 1994 MGA Zone 55

ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material.

ARTC will not be responsible for any loss or damage suffered as a result of any person whatsoever placing reliance upon the information contained within this GIS map.

Date: 27/02/2020 Paper: A4
 Author: PK (GHD) Scale: 1:310,000

Data Sources: Aerial imagery, DCDB/DTDB: LPI, 2015; 250K Topographic Data Series 3: Geoscience Australia; All other layers; Jaco

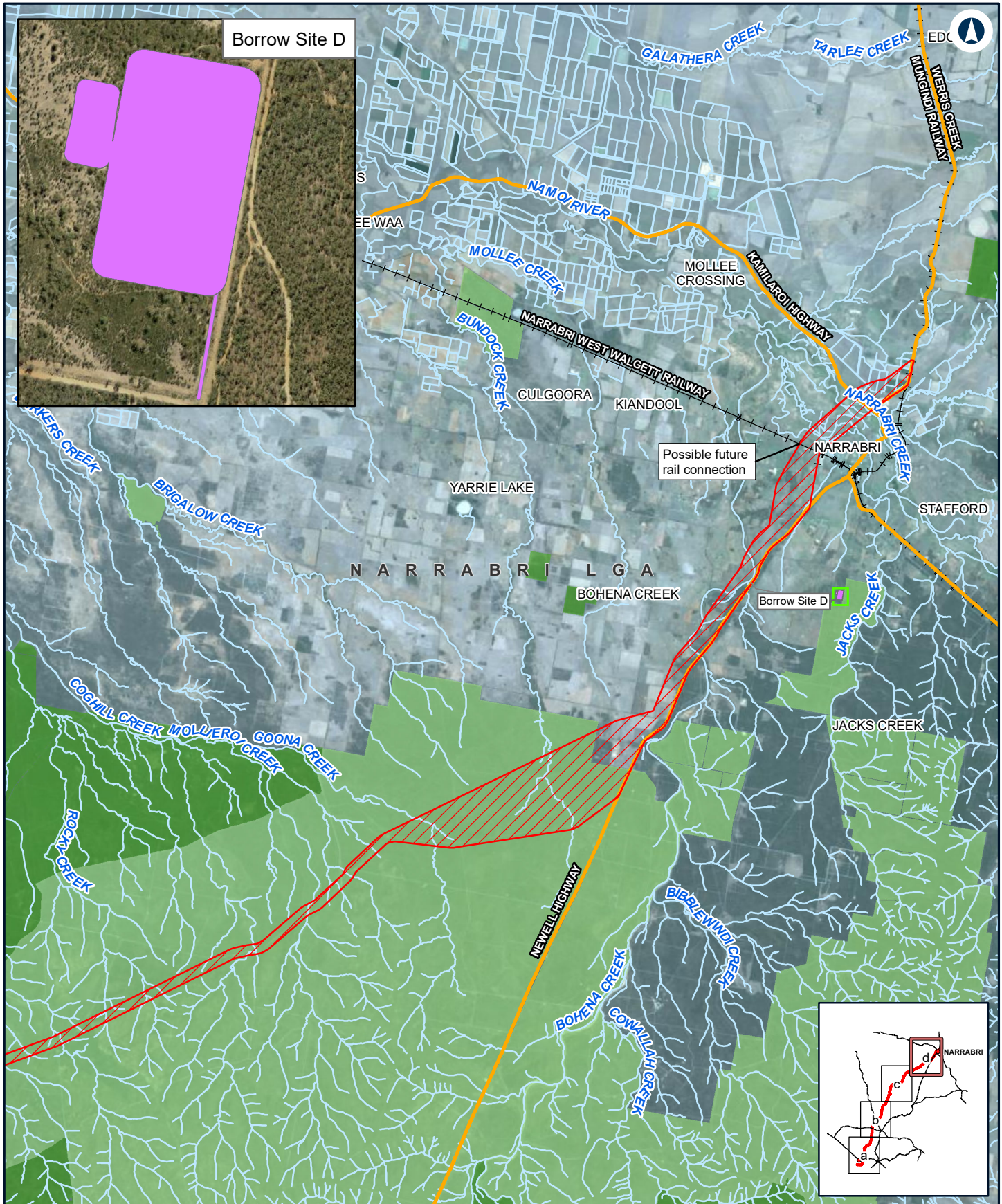
LEGEND

- Phase 2 Study Area
- Phase 2 Study Area Modified
- Local Government Area
- Railway
- Highway
- Watercourse
- Conservation reserve
- Borrow Pit and Haul Road
- Forestry reserve

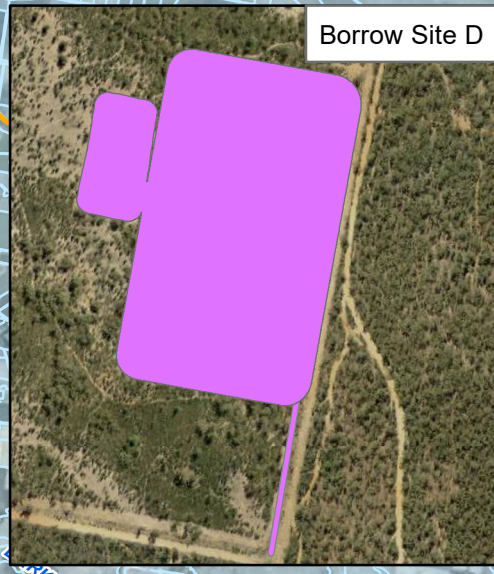
INLAND RAIL

ARTC

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



Borrow Site D



NARROMINE TO NARRABRI

Figure 1: Location of Proposal Features

0 4 8 Km

LEGEND

- Phase 2 Study Area
- Local Government Area
- Railway
- Highway
- Watercourse
- Forestry reserve
- Conservation reserve
- Borrow Pit and Haul Road

Coordinate System: GDA 1994 MGA Zone 55
 ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material.
 ARTC will not be responsible for any loss or damage suffered as a result of any person whatsoever placing reliance upon the information contained within this GIS map.

Date: 27/02/2020 Paper: A4
 Author: PK (GHD) Scale: 1:310,000
 Data Sources: Aerial imagery, DCDB/DTDB: LPI, 2015; 250K Topographic Data Series 3: Geoscience Australia; All other layers; Jaco



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

Table 1: Borrow Pits – Indicative Sizes

BORROW SITES	POTENTIAL EXTRACTION VOLUME (M ³)
Borrow Pit A – Tanitha Road, Narromine	350,000
Borrow Pit B – Tomingley Road, Narromine	500,000
Borrow Pit C – Euromedah Road, Narromine	675,000
Borrow Pit D – Perimeter Road, Narrabri	975,000

The borrow pits have been selected based on preliminary geotechnical investigations, consultation with the landholder and fill requirements for the proposal. The rationale for each of the borrow pits is summarised below:

- ▶ Borrow pits A and B – a large volume of fill is required south of the Macquarie River where there are no cuts along the alignment to supply this material. If the borrow pits were not established a significant number of truck movements would be required through Narromine from the north side of the Macquarie River resulting in major impacts
- ▶ Borrow pit C – a large volume of fill is required in the area north of the Macquarie River where there are a limited number of cuts along the alignment to supply this material. Further, preliminary geotechnical investigations have identified a substantial shortage of structural fill in this area, which can be obtained from this borrow pit. Haulage from other parts of the alignment to the north is economically unfeasible and would result in a significant number of truck movements on the public road network and major impacts
- ▶ Borrow pit D – a large volume of fill is required in the northern parts of Pilliga East State Forest where there are a limited number of cuts along the alignment to supply this material. Haulage from other parts of the alignment to the south is economically unfeasible and would result in a significant number of truck movements on the public road network and major impacts.

Access to the proposal site from borrow pits would be via new access roads connecting the borrow pit to the nearest public road, then via the public road network to the proposal site.

Typical facilities and activities at the borrow pits are:

- ▶ Offices and lunch facilities
- ▶ Diversion drains (for up-slope surface flow) and sedimentation basins
- ▶ Crushing plant (for oversized excavated material)
- ▶ Blasting (borrow pit C and borrow pit D only) if hard rock is encountered at depth.

Following extraction of all required material from the borrow pit, all facilities would be removed and they would be stabilised to be a free draining landform and rehabilitated. It is proposed to use excess material (that does not meet design specifications or cannot be feasibly used within the rail formation) from the main construction works to assist with the reshaping of the borrow pits.

2.1.1 Justification for Borrow Pits

The identification of the proposed borrow pit sites is based on an EOI process, geological information, existing land use, transportation distances and haulage routes and minimisation of environmental impacts. The required material cannot be sourced from within the proposed rail corridor and would be required to be imported from external borrow sites near the proposal. Borrow pit sites are a key component of the proposal, and ultimately, the N2N project cannot proceed without general and structural fill.

Additional benefits include:

- ▶ Socio-economic benefits: the use of borrow pit sites for the proposal would be subject to landholder agreement. All landholder would be compensated as part of a lease agreement and the land rehabilitated prior to handing back on completion. Therefore the establishment and operation of borrow sites would

provide direct economic benefits to the affected landholder and local economy as opposed to purchase of the materials from outside the local area and/or region.

- ▶ Traffic and transport benefits: the proposed use of borrow pits would reduce heavy vehicle movements on State and local roads relative to the scenario where the material was sourced from outside the local area and/or region. This would improve road safety by reducing long distance heavy vehicle movements on public roads.

2.2 Alignment Refinement

In February 2020, the N2N project team completed the Focused Area of Investigation process, where the N2N Study Area (up to 5 kilometres wide) was narrowed to between 150 to 400 metres wide. The final rail corridor will be between 40 to 60 metres wide. As part of the process, ARTC are actively engaging with directly affected landholders and out of these discussions a design optimisation opportunity was identified for an alternative alignment at Black Hollow.

The location of the proposed alternative alignment requires a minor modification to the N2N Study Area and is shown in Figure 1.

2.2.1 Justification for Alignment Refinement

The alternative alignment was requested by the landholder to improve their ongoing use and access across the property. It also allows ARTC to straighten the alignment without adversely affecting other landholders and reduces the overall track length by approximately 400 metres, which assists to meet Inland Rail's service offering.

2.3 Rail Connections

The proposal will connect with the following existing rail lines that are part of the ARTC and Country Regional Network rail networks:

- ▶ Narromine Junction
 - ▶ South to West (Narromine to Cobar Line) (possible future connection)
 - ▶ North to East (Parkes to Narromine Line) (possible future connection)
- ▶ Curban Junction (Dubbo to Coonamble Line)
 - ▶ West to South (possible future connection)
 - ▶ West to North
 - ▶ East to South
 - ▶ East to North (possible future connection)
- ▶ Narrabri Junction (Narrabri to Walgett Line)
 - ▶ West to South (possible future connection)

The connections are shown in Figure 1. The 'possible future connections' may be constructed at a later date, however will be included in the N2N EIS to obtain planning approval.

2.3.1 Justification for existing rail line connections

Connectivity and interoperability are key characteristics of the Inland Rail project and its outcomes. Inland Rail is a strategic enhancement of the National Supply Chain which provides connectivity to regional Australia. In accordance with that strategic intent, the following Connectivity Principles are proposed to provide guidance for the connection of Inland Rail to the existing network:

- ▶ ARTC Inland Rail is committed to working collaboratively with stakeholders to ensure the efficient connectivity

- ▶ Direct connectivity is only provided when there is no reasonably efficient connection already available, or will be available, once Inland Rail is constructed

It is acknowledged that the strategic objective of Inland Rail connecting regional Australia is very important consideration however it is also a requirement that the connections have genuine need with enough existing or future traffic volumes to ensure that the value for money criteria can also be demonstrated.

3 Existing Land Use

3.1 Borrow Pits

The land use at the four borrow pit sites is mainly for rural residential, agricultural and grazing purposes, with large rural properties surrounding the sites. Sites are either located within the Narromine or Narrabri Local Government Area. All sites are on freehold land.

Table 2: Borrow Pit Site Zoning and Land Use Details

BORROW PIT	LAND USE ZONING	LOCAL ENVIRONMENTAL PLAN	SPECIFIC LAND USE
Borrow Pit A	RU1: Primary Production	Narromine Local Environmental Plan 2011	Private land used for agricultural activities
Borrow Pit B	RU1: Primary Production	Narromine Local Environmental Plan 2011	Private land used for agricultural activities
Borrow Pit C	RU1: Primary Production	Narromine Local Environmental Plan 2011	Private land used for agricultural activities
Borrow Pit D	RU1: Primary Production	Narrabri Local Environmental Plan 2012	Private land used for agricultural activities

3.2 Alignment Refinement

The proposed alternative alignment is located on land used mainly for rural residential, agricultural and grazing purposes, with large rural properties surrounding the site. This site is located within the RU1 Primary Production zoning of the Coonamble Local Environmental Plan 2011.

4 Proposed Assessment Methodologies and EIS Content for the Borrow Pits

The environmental and social impact assessment of the proposal features associated with the alignment refinement and rail connections would fulfil the requirements of the N2N project SEARs issued on 28 November 2018.

Discussions between ARTC and DPIE noted that additional environmental and social impact assessment requirements should be applied to the borrow pits. A summary of the key potential impacts, proposed assessment methodologies and EIS content for the borrow pits is provided in the following sections. This information has been provided so that DPIE can issue updated SEARs for the N2N Project.

4.1 Air Quality

The main potential impact on air quality during construction and operation of the borrow pit sites would be due to the generation of dust from excavation works, crushing and screening of extracted materials and the movement of plant and machinery within borrow pits sites and unsealed haul routes. If dust is not adequately controlled, it could impact on surrounding sensitive receivers and agricultural land uses.

The main potential impact on air quality post-construction would occur as a result of disturbed areas of the sites, particularly where earthworks have occurred. This would primarily be associated with the sites and new

access roads and haul routes. These issues would be managed by implementing the rehabilitation strategy, in consultation with the landowners. A Borrow Pit Rehabilitation Strategy will be included in the EIS.

A specialist air quality impact assessment will be undertaken as part of the EIS for the establishment and operation of the borrow pit sites and road haulage in accordance with the current guidelines, with a particular focus on dust emissions, including PM_{2.5} and PM₁₀. The air quality impact assessment will 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
- ▶ Documenting the characteristics of emissions and their effect on local and regional air quality conditions
- ▶ Demonstrated ability to comply with the relevant regulatory framework
- ▶ A cumulative local and regional air quality impact assessment.

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

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

4.2 Biodiversity

The key potential impacts of the borrow pit sites include;

- ▶ Clearing of native vegetation within the proposed borrow sites or haul routes, which may clear threatened flora species listed under the EPBC Act and/ or *Biodiversity Conservation Act 2016* (BC Act)
- ▶ Loss of fauna habitat and impacts on threatened species and endangered populations, listed under the EPBC Act and/ or BC Act
- ▶ Habitat fragmentation and connectivity issues for flora and fauna
- ▶ Potential for impacts to wildlife including threatened species listed under EPBC Act and/ or BC Act.

Other indirect impacts include:

- ▶ Dispersion and potential encouraged growth of weeds during construction activities by exposing soil and clearing vegetation
- ▶ Effects on nearby fauna, listed under the EPBC Act and/ or BC Act, with related construction noise and light impacts.

A biodiversity assessment will be undertaken in accordance with the Biodiversity Assessment Method (BAM) as required under the BC Act. This assessment will result in a Biodiversity Development Assessment Report (BDAR) which will identify how ARTC will avoid and minimise impacts, any potential impacts that could be characterised as serious and irreversible according to the specified principles and any offset obligations required to offset the likely biodiversity impacts of the project.

This requirement is consistent with the current Narromine to Narrabri SEARs issued on 28 November 2018.

The assessment will also have regard to the extent of any impacts on matters under the EPBC Act. Note: The inclusion of the borrow pit sites would not increase the impact of the proposal on Commonwealth Matters of National Environmental Significance.

ARTC will include rehabilitation of the borrow sites within the assessment of the proposal. This includes:

- ▶ Development a Borrow Pit Rehabilitation Strategy covering:

- ▶ Rehabilitation objectives, methodology, monitoring programs, performance standards and proposed completion criteria
- ▶ Nominated final land use and landform having regard to any relevant strategic land use planning or resource management plans or policies
- ▶ The potential for integrating this strategy with other rehabilitation and/ or offset strategies in the region.

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

- ▶ Policy and Guidelines for Fish Habitat Conservation and Management – Update 2013 (DPI, 2013b)
- ▶ Threatened Species Survey and Assessment Guidelines
- ▶ Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2003)
- ▶ NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017a)
- ▶ Aquatic Ecology in Environmental Impact Assessment – EIA Guideline (Marcus Lincoln Smith 2003)
- ▶ Freshwater threatened species distribution maps (www.dpi.nsw.gov.au/fishing/species-protection/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps).

4.3 Noise and Vibration

The EIS will include a noise and vibration assessment for the borrow pit sites as per the current N2N Project SEARs. This assessment will include:

- ▶ Identification of sensitive receivers
- ▶ Assessment of construction noise levels, including haulage vehicles, on sensitive receivers and development of mitigation measures to manage impacts
- ▶ Assessment of construction noise and vibration in accordance with relevant NSW noise and vibration guidelines, with consideration of impacts to the structure 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) will be capable of complying with the current guidelines
- ▶ Identification of opportunities to reduce noise impacts through design or management measures.

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

- ▶ Interim Construction Noise Guideline (DECC, 2009)
- ▶ Construction Noise Strategy (TfNSW, 2017b)
- ▶ Assessing Vibration – a technical guideline (DECC, 2006)
- ▶ NSW Road Noise Policy (DECCW, 2011)
- ▶ Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZECC, 1990)
- ▶ Environmental Noise Management Manual (RTA, 2001)
- ▶ Development Near Rail Corridors and Busy Roads – Interim Guideline (DoP, 2008)
- ▶ Noise Mitigation Guideline (RMS, 2015a)
- ▶ Noise Criteria Guideline (RMS, 2015b)
- ▶ NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017a)
- ▶ German Standard DIN 4150-3: Structural Vibration - effects of vibration on structures.

4.4 Traffic and Transport

The EIS will include a traffic and transport assessment for the borrow pit sites as per the current N2N Project SEARs. This assessment will include:

- ▶ Identification of vehicle movements and access and haulage routes during construction, including the number, frequency and size of construction related vehicles
- ▶ 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 assessment will be undertaken with consideration of relevant legislation and guidelines, including:

- ▶ Guide to Traffic Management – Part 3 Traffic Studies and Analysis (Austroads, 2007)
- ▶ Guide to Traffic Generating Developments Version 2.2 (RTA, 2002)
- ▶ Cycling Aspects of Austroads Guides (Austroads, 2014)
- ▶ NSW Bicycle Guidelines v 1.2 (RTA, 2005)
- ▶ Planning Guidelines for Walking and Cycling (DIPNR, 2004)
- ▶ Future Transport Strategy 2056 (TfNSW, 2018a)
- ▶ NSW Draft Freight and Ports Plan (TfNSW, 2018b).

4.5 Geology, Soils and Contamination

The EIS will include a geology, soils and contamination assessment for the borrow pit sites as per the current N2N Project SEARs. This assessment will include:

- ▶ Targeted geotechnical and preliminary contamination investigations will be undertaken as part of the design development process. Consideration of soils and geology, and contamination will 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 borrow sites
 - ▶ Consideration of whether the land is likely to be contaminated and whether remediation is required will be undertaken in accordance with current guidelines
 - ▶ Assessment of impacts on soil and land resources.

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

- ▶ Managing Land Contamination: Planning Guidelines SEPP 55 –Remediation of Land, (DUAP & EPA, 1998)
- ▶ Guidelines for Consultants Reporting on Contaminated Sites (OEH, 2011a)
- ▶ Guidelines for the NSW Site Auditor Scheme (DEC, 2006b)
- ▶ Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA, 2015)
- ▶ Urban and regional salinity – guidance given in the Local Government Salinity Initiative booklets (<http://www.environment.nsw.gov.au/salinity/solutions/urban.htm>) which includes Site Investigations for Urban Salinity (DLWC, 2002)
- ▶ Landslide risk management guidelines presented in Australian Geomechanics Society (2007)
- ▶ Soil and Landscape Issues in Environmental Impact Assessment (DLWC 2000)

- ▶ 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, 2008b)
- ▶ Other guidelines made or approved under section 105 of the Contaminated Land Management Act 1997.

4.6 Aboriginal Heritage

The EIS will include an Aboriginal Cultural Heritage Assessment Report, which considers the borrow pit sites, as per the current N2N Project SEARs. The assessment will describe and assess the significance of any Aboriginal objects and/or places that may be impacted and provide options to avoid, mitigate or manage the harm to those object and/or places. The assessment will include consultation with the relevant stakeholders and Aboriginal parties, including Native Title parties.

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

- ▶ Guide to Investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011b)
- ▶ Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010a)
- ▶ Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010b)
- ▶ The Australia ICOMOS Burra Charter (Australia ICOMOS, 2013).

4.7 Visual Amenity

A landscape and visual assessment will be undertaken to identify the potential visual impacts on sensitive receivers from construction, operation and rehabilitation of the borrow pit sites. This assessment will include details of the potential impacts on sensitive receivers, viewpoints and amenity impacts during construction. Th assessment will be prepared as per the current N2N Project SEARs with consideration of relevant legislation and guidelines, including:

- ▶ AS4282-1997 Control of the obtrusive effects of outdoor lighting
- ▶ Dark Sky Planning Guideline Protecting the observing conditions at Siding Spring (DEP 2016)
- ▶ NSW Sustainable Design Guidelines Version 4.0 (TfNSW, 2017a)
- ▶ Technical Guideline for Urban Green Cover in NSW (OEH, 2015b).

4.8 Hydrology and Flooding

A hydrology and flooding assessment will be undertaken for the borrow pit sites and include:

- ▶ A description of the existing hydrological regime for any surface and groundwater resources likely to be impacted, including stream orders
- ▶ Assessment of the impact of construction and changes following rehabilitation of the borrow pits and any ancillary facilities on surface and groundwater hydrology, including:
 - ▶ Natural processes within rivers and floodplains that affect the health of the system and landscape health, aquatic connectivity and access to habitat
 - ▶ Direct or indirect increases in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses
 - ▶ Minimising the effects of proposed stormwater and wastewater management during construction and following rehabilitation of borrow pits on natural hydrological attributes and on the capacity of existing stormwater systems where discharges are proposed through such systems
 - ▶ Water take from all surface and groundwater sources, with estimates of annual volumes during construction
- ▶ Identification if any requirements for baseline monitoring of hydrological attributes

- ▶ Assessment and modelling of the impacts on flood behaviour during construction and following rehabilitation of borrow pits for a range of flood events. The assessment will include considerations of flood levels for a range of flood events.

The assessment will be prepared as per the current N2N Project SEARs with consideration of relevant legislation and guidelines, including:

- ▶ NSW Government's Floodplain Development Manual (Department of Natural Resources, 2005)
- ▶ PS 07-003 New guideline and changes to section 117 direction and EP&A Regulation on flood prone land (DoP, 2007)
- ▶ Practical Consideration of Climate Change - Flood risk management guideline (DECC, 2007)
- ▶ Floodplains Management Plans: <https://www.industry.nsw.gov.au/water/plans-programs/healthyfloodplains-project/plans>
- ▶ Change Impacts and Risk Management: A Guide for Business and Government, AGIC Guidelines for Climate Change Adaptation
- ▶ Australian Disaster Resilience Handbook 7 – Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia (AIDR, 2017)
- ▶ AS/NZS 31000:2009 Risk Management – Principles and Guidelines.

4.9 Surface Water and Groundwater

A surface water and groundwater assessment will be undertaken for the borrow pit sites and will include:

- ▶ Documentation of the ambient NSW Water Quality Objectives and environmental values for the receiving waters relevant to the borrow sites, including the indicators and associated trigger values or criteria. This will include consideration how of the borrow sites can influence these objectives
- ▶ Identification and estimation of the quality and quantity of all pollutants with potential to be introduced as a result of the borrow sites, identifying their source and discharge point. This will include consideration of potential impacts on the environment and human health
- ▶ Identification of the rainfall event for which water quality protection measures have been designed
- ▶ Assessment of the significance of impacts
- ▶ Identification of existing groundwater conditions and assessment of the potential impacts on groundwater levels, quality and quantity during construction and following rehabilitation of borrow pits.

The EIS will be prepared as per the current N2N Project SEARs with consideration of relevant legislation and guidelines, including:

- ▶ NSW Water Quality and River Flow Objectives at <http://www.environment.nsw.gov.au/ieo/>
- ▶ Using the ANZECC Guidelines and Water Quality Objectives in NSW (DEC, 2006a)
- ▶ Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000)
- ▶ Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DECC, 2008a)
- ▶ 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, 2008b).<insert appendix name>