

PART A Introduction and Context

1. Introduction

1.1 Background

On 5 September 2004, the Australian Rail Track Corporation (ARTC) commenced a 60 year lease of the interstate and Hunter Valley rail lines of New South Wales. Since commencing this lease, aspects of the Hunter Valley network have been reviewed and updated by ARTC due to a rapid growth in coal demand. This has resulted in the development of the Hunter Valley Corridor 2007-2012 Capacity Strategy (ARTC, 2007).

At present, the Hunter Valley rail network coal capacity averages around 107 million tonnes per annum (mtpa). Current industry forecasts indicate demand on the Hunter Valley rail network will increase to 165 mtpa by March 2010. ARTC is therefore implementing a strategy of line improvements endeavouring to keep system capacity ahead of industry demands. The design and construction of the Minimbah Bank Third Track is a key component in meeting the objectives of the Strategy.

Minimbah Bank is one of only three sections of track on the Main Northern Railway, which for reasons of rail safety requires trains to maintain safe spacing of greater than 10 minutes (known as headway). The steep grade (1:80) results in trains being unable to maintain sufficient speeds to keep a safe distance, creating the current headways of 13 minutes. This has the potential for trains to stall on the Bank, creating severe service disruptions, reduced line capacity and high rail wear. As 95% of coal trains in the Hunter Valley negotiate Minimbah Bank, this problem has significant impacts to the current and future line capacity.

1.2 The Project

The proposed Minimbah Bank Third Track Project (herewithin described as the Project) consists of construction of a third track adjacent to the existing rail line at a revised grade of 1:100 in comparison to the grade of the existing main line of 1:80. The major elements of the Project include:

- Approximately 10.8 km of new track and earthworks;
- Widening of the existing Main Northern Railway corridor;
- Two new rail under bridges;
- Grade separation of the existing Range Road level crossing;
- Replacement and realignment of the existing Golden Highway overbridge;
- Services relocation and signalling works; and
- Property acquisition.

1.3 Location of the Project

The Project is located within the Singleton Local Government Area (LGA) and involves widening of the existing Main Northern Railway corridor. It commences in an area known as Minimbah approximately 16 km south of Singleton and continues north for approximately 10.8 km to an area known as Whittingham. The Project site is illustrated in Figure 1-1.

The northwestern portion of the Project site is generally flat, comprising the floodplain areas of the Hunter River and its tributaries. However, the project site continues to rise towards the southeast, containing more undulating topography. A number of creeks and drainage lines run through the Project and drain into the Hunter River to the north, including Mudies Creek. The majority of the area adjoining northwestern section of the Project has been cleared for grazing, with some disturbance and partially cleared vegetation at the southeastern end.

The existing transport infrastructure within the area surrounding the Project consists of the Main Northern Railway, one national highway (the New England Highway) and one state highway (the Golden Highway).

The land uses adjoining the Project are predominantly rural, including grazing land and associated rural residences. The New England Highway is located to the east of the Main Northern Railway, running parallel or in close proximity to the Project. Both public and private roads cross the Project, including the Golden Highway (via an overbridge), Range Road (via a level crossing) and a private level crossing. An airstrip is adjacent to the northern section of the Project site, while a nursery and landscaping supplies business is located between the New England Highway and the Main Northern Railway at Whittingham.

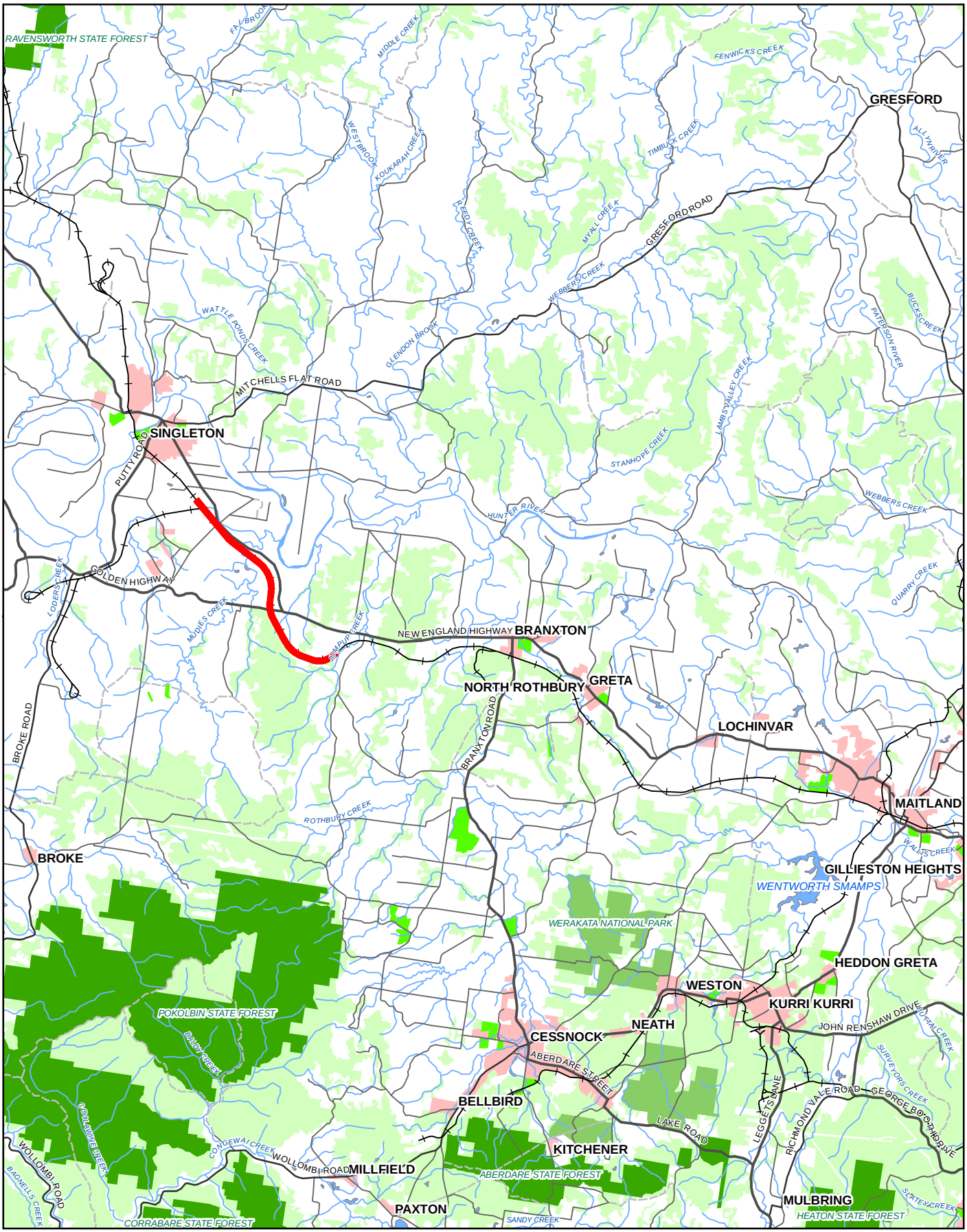
1.4 Guide to the Approval Requirements and the Environmental Assessment

1.4.1 Summary of Approval Requirements

The Project is subject to approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Part 3A applies to the Project as a whole as it meets the Major Projects requirements pursuant to Schedule 1 (clause 23) of *State Environmental Planning Policy (Major Projects) (2005).*

The Minister for Planning is the approval authority for the Project. An Environmental Assessment (this document) is required to support the application for Project Approval in accordance with the requirements of Section 75 of the EP&A Act.

Further information on the Project and statutory requirements are provided in Section 6.



1:250,000 for A4

0 1 2 4 6 8 Kilometers

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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ARTC - Minimbah Third Track
Environmental Assessment
Locality Plan

job no. 22-13755
rev no. A

Figure 1.1

25 June 2008

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1.4.2 Purpose and Scope of the Environmental Assessment

The Environmental Assessment provides:

- Information on the Project, including its strategic context, justification and the alternatives considered;
- An assessment of the potential environmental impacts of the Project, with a focus on the key assessment requirements identified in the Department of Planning's Director-General's Requirements (DGRs); and
- Measures proposed to minimise and manage potential environmental impacts.

The DGRs were obtained by ARTC in response to the Project Application submitted to the Department of Planning (DoP). The DGRs outline the key issues that ARTC must address in the Environmental Assessment of the Project.

A copy of the DGRs is provided in Appendix A and is summarised in Table 1-1.

Table 1-1 Summary of the Director-General's Environmental Assessment Requirements – Key Issues

Environmental Assessment Requirement	Where Addressed in the Environmental Assessment
Strategic and Project Justification	Section 5
Ecology	Section 7
Cultural Heritage	Section 8
Land Use and Access	Section 9
Noise and Vibration	Section 10
Hydrology	Section 11
Soils and Geology	Section 12
Environmental Risk Analysis	Section 4
Consultation	Section 3

1.4.3 Contents of Environmental Assessment

The DGR's include an outline of the required structure of the Environmental Assessment. Table 1-2 provides the structure and a description of the content of each section of the Environmental Assessment that complies with the required structure.

Table 1-2 Structure of the Environmental Assessment

Section	Title	Description
Executive Summary	Executive Summary	Summarises the Environmental Assessment
PART A	Introduction and Context	
Section 1	Introduction	This section provides an overview of the location and key features of the Project, the approval process and the Environmental Assessment requirements.
Section 2	Description of the Project	This section provides a description of the Project including construction activities and operation.
Section 3	Consultation	This section details the outcomes of community and statutory consultation for the Project.
Section 4	Environmental Risk Analysis	This section details the environmental risk analysis undertaken for the Project.
Section 5	Strategic and Project Justification	This section details the strategic assessment, the justification for the Project and the alternatives considered to the Project.
PART B	Statutory Framework	
Section 6	Statutory Framework	This section outlines the statutory framework for the Project, including details on the approval authority, the application process, environmental planning instruments and legislative requirements.
PART C	Environmental Assessment	
Section 7 to 13	Key Environmental Assessment Requirements	This section provides details on the DGR's including ecology, Indigenous heritage, land use, access, noise and vibration, hydrology and flooding and soils and geology. It also includes key environmental issues raised during the environmental risk analysis process such as visual amenity.
Section 14	Other Environmental Assessment Requirements	This section provides an assessment of other environmental issues and includes details on social and economic, air quality and climate, traffic and transportation, energy and greenhouse, resource conservation and waste management and risks and hazards.

Section	Title	Description
PART D	Environmental Management	
Section 15	Draft Statement of Commitments	This section provides the Draft Statement of Commitments, which includes details on mitigation measures, environmental management and monitoring for the Project.
PART E	Project Justification and Conclusion	
Section 16	Justification of the Project	This section provides the Project Justification including achieving objectives and principles of ecologically sustainable development and the consequences of not proceeding.
Section 17	Conclusion	This section provides the conclusion for the Environmental Assessment.
Section 18	References	This section provides the references used within this assessment.

The Appendices are provided at the end of the Environmental Assessment to supplement the main document. The Appendices include:

- Director-General's Requirements (Appendix A);
- Draft Statement of Commitments (Appendix B);
- Major Infrastructure Design Drawings (Appendix C)
- Community Updates (Appendix D);
- Flora and Fauna Impact Assessment (Appendix E);
- Aboriginal Heritage Impact Assessment (Appendix F);
- Noise and Vibration Assessment (Appendix G);
- Preliminary Contamination Assessment (Appendix H); and
- Traffic and Transport Assessment (Appendix I).

2. Description of the Project

2.1 Introduction

2.1.1 Summary

The Project consists of the construction of a third track adjacent to the existing Up Main line at a revised grade of 1:100 in comparison to the grade of the existing main line of 1:80. The third track commences north of Whittingham Junction at chainage 235.070 km and rejoins the main line at Belford, chainage 224.220 km (Refer to Figure 2-1). The Project also includes widening of the existing rail corridor in some sections to accommodate the footprint of the Project and associated infrastructure. The major elements of the Project are outlined in Section 1.2.

2.1.2 Property Acquisition

Construction of the third track and associated infrastructure would require the strip acquisition of properties adjacent to the existing rail corridor on both the Up and Down sides of the track. Approximately 30 lots from 26 landowners would need to be partially acquired as part of the works. This is discussed in detail in Section 9.2.

2.1.3 Proposed Track Configuration

The proposed configuration for the Minimbah Bank Third Track Project is illustrated in :

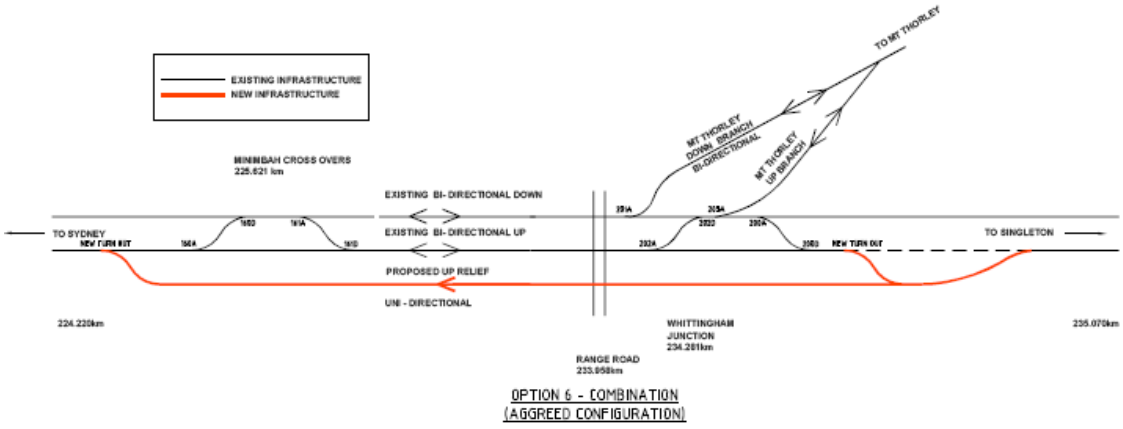


Figure 2-2 Proposed Track Configuration



N

LEGEND

Project Route — Existing Rail — Cadastre

1:50,000 for A4

0 200 400 800 1,200 1,600

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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ARTC - Minimbah Third Track
Environmental Assessment
Aerial Photography with Project Route
25 June 2008

job no. 22-13755
rev no. A

Figure 2.1

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2.1.4 Third Track Alignment

Locations along the rail line are noted by the term chainage. The chainage at a location is the distance of that point in relation to Sydney (NSW only) based on the 0.000 km being located at the end of Central No. 1 Platform. To provide an accurate location description, chainage will be used throughout this EA. In describing the existing and proposed rail lines the following terms are used:

- **Up Main:** Primary (main) rail line that trains traverse when they are heading toward Sydney and is usually positioned on the right when your back is to Sydney;
- **Down Main:** Primary (main) rail line that trains traverse when they are heading away from Sydney and is usually positioned on the left when your back is to Sydney; and
- **Up Relief:** Secondary rail line that runs parallel with the main line(s) that trains traverse when they are heading toward Sydney and is usually positioned on the right of the main line when your back is to Sydney. Usually provides a passing facility enabling trains to pass those traversing or stationary on the main line thus giving relief to the main line operations. The Up Relief is the proposed third track.

The third track is proposed to run adjacent to the Up Main at a maximum grade of 1:100. The third track, which is also known as the Up Relief, begins at approximate chainage 235.070 km and rejoins the existing line at approximate chainage 224.220 km. The difference in grade between the proposed Up Relief and existing line is illustrated in Figure 2-3 below.

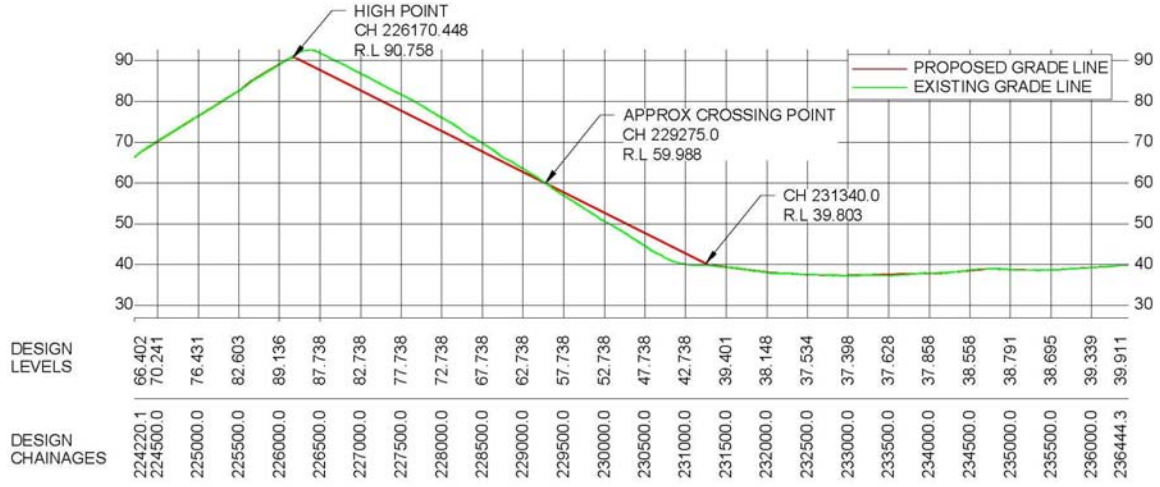


Figure 2-3 Grade Difference Between Existing Up Main and Proposed Up Relief

The new Up Relief is at the same level as the existing main line from 235.070 km to 231.340 km. From approximate chainage 231.340 km the new Up Relief rises above the existing main line to a maximum vertical distance of 3.5 m.

At approximate chainage 229.275 km the Up Relief then drops lower than the main line, resulting in the Up Relief being at a maximum vertical distance of 4.25 metres below the existing main line.

By approximate chainage 226.170 km the grades of the Up Relief and existing main line are again level with the Up Relief re-joining the main line at approximate chainage 224.220 km.

2.1.5 Major Infrastructure Elements

Major infrastructure elements included in the Project are as follows and are further detailed in Section 2.3.

- Approximately 10.8 km of track including turnouts, junctions and signalling;
- Approximately 10.8 km of earthworks including drainage and minor structures;
- A rail underbridge (major culvert) at the western end of the Project route (approximate chainage 234. 240 km);
- Grade separation of Range Road level crossing (approximate chainage 233.958 km);
- A new rail underbridge at Mudies Creek (approximate chainage 232.167 km);
- A new rail overbridge and associated road works at the Golden Highway (approximate chainage 228.790 km);
- Proposed closure of the private level crossing near the existing nursery (approximate chainage 231.180 km) with provision for alternate private access; and
- A retaining wall of approximately four metres in height and 540 metres in length (between approximate chainages 230.190 km and 230.730 km) to retain the third track fill batter from encroaching on the New England Highway road reserve.

2.1.6 Typical Cross Sections

To enable Project construction adjacent to the existing line at a revised grade of 1:100, the Project requires earthworks formations at grade, in cut and in fill. Typical cross sections illustrating these earthworks scenarios are illustrated in Figure 2-4, Figure 2-5 and Figure 2-6.

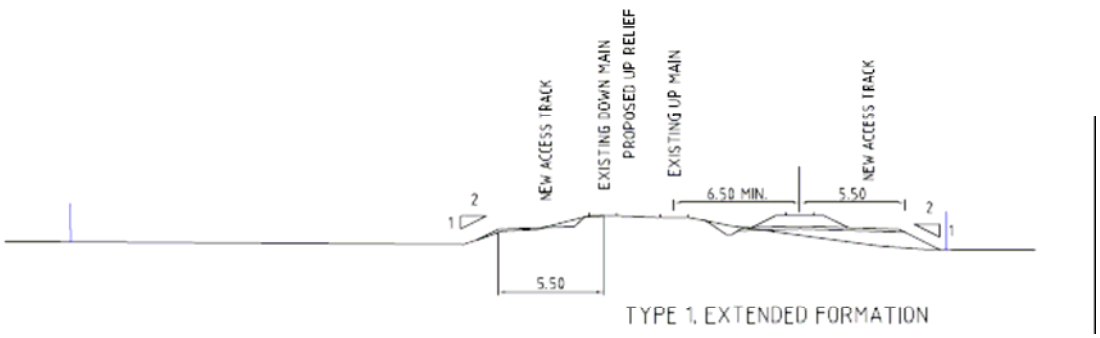


Figure 2-4 Type 1 Cross Section – Extended Formation

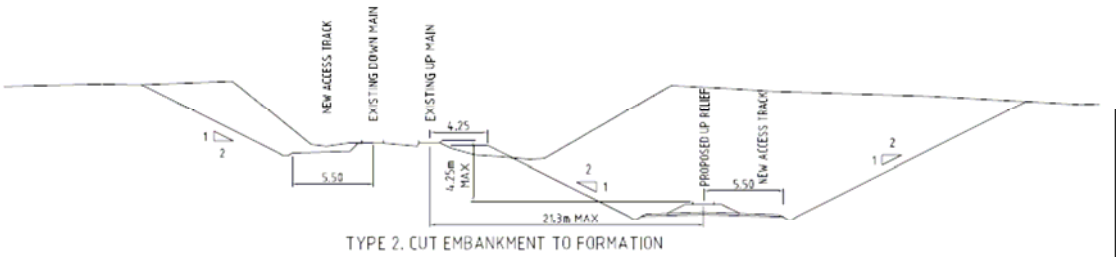


Figure 2-5 Type 2 Cross Section – Embankment to Formation

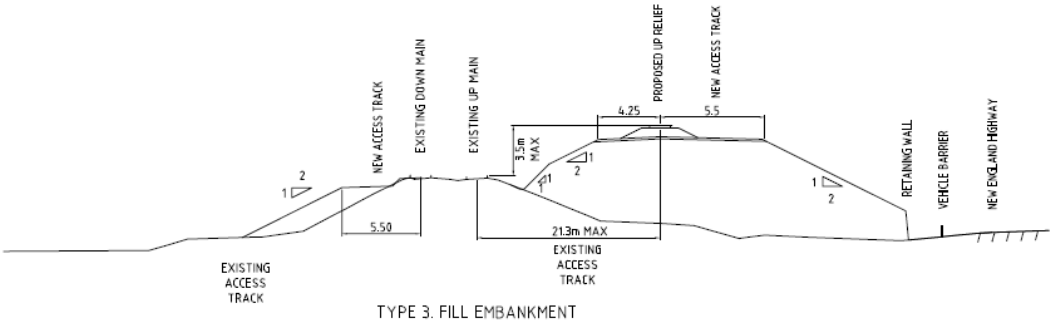


Figure 2-6 Type 3 Cross Section – Fill Embankment

2.1.7 Civil Enabling Works

The design and construction of the Project impacts on a number of existing signalling infrastructure, services and utilities. The relocation of this infrastructure to facilitate construction of the Project is being undertaken separately and has been assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* and the ARTC Code of Practice for Environmental Impact Assessment of Development Proposals in NSW (2006). Services relocations includes gas, communications, power and water infrastructure. Signalling relocations include construction of new cable route on the Down side of the mainline and relocating signal locations from the Up side to the Down side of the mainline.

GHD prepared a Review of Environmental Factors (REF) (May *2008*) to assess the impacts relating to the relocation of the rail signalling services, RailCorp CCTV (Closed Circuit Television), optical fibre cable and private irrigation lines. Other services requiring relocation will be assessed under separate REFs prepared and determined by the relevant services providers. The relocation of services would be undertaken in conjunction with the owners of the assets, and would include measures for temporary and permanent relocation.

2.1.8 Bulk Earthworks Requirements

The approximate bulk earthworks requirements for the key elements of the Project are as follows:

- Third Track:
  - Cut – 530,000 cubic metres;
  - Fill – 292,000 cubic metres;
  - Capping – 21,000 cubic metres;
  - Maximum cut depth – 10.3 metres (4.25 metres below the existing track); and
  - Maximum fill depth – 8.8 metres (3.5 metres above the existing track).
- Golden Highway Road Re-Alignment:
  - Cut – 1,800 cubic metres; and
  - Fill – 63,000 cubic metres.
- Range Road:
  - Cut – 0 cubic metres; and
  - Fill – 79,000 cubic metres.

It should be noted that these quantities are approximate and based on concept design estimates. The quantities would be further refined during the detailed design phase.

2.2 Proposed Construction Activities

2.2.1 Introduction

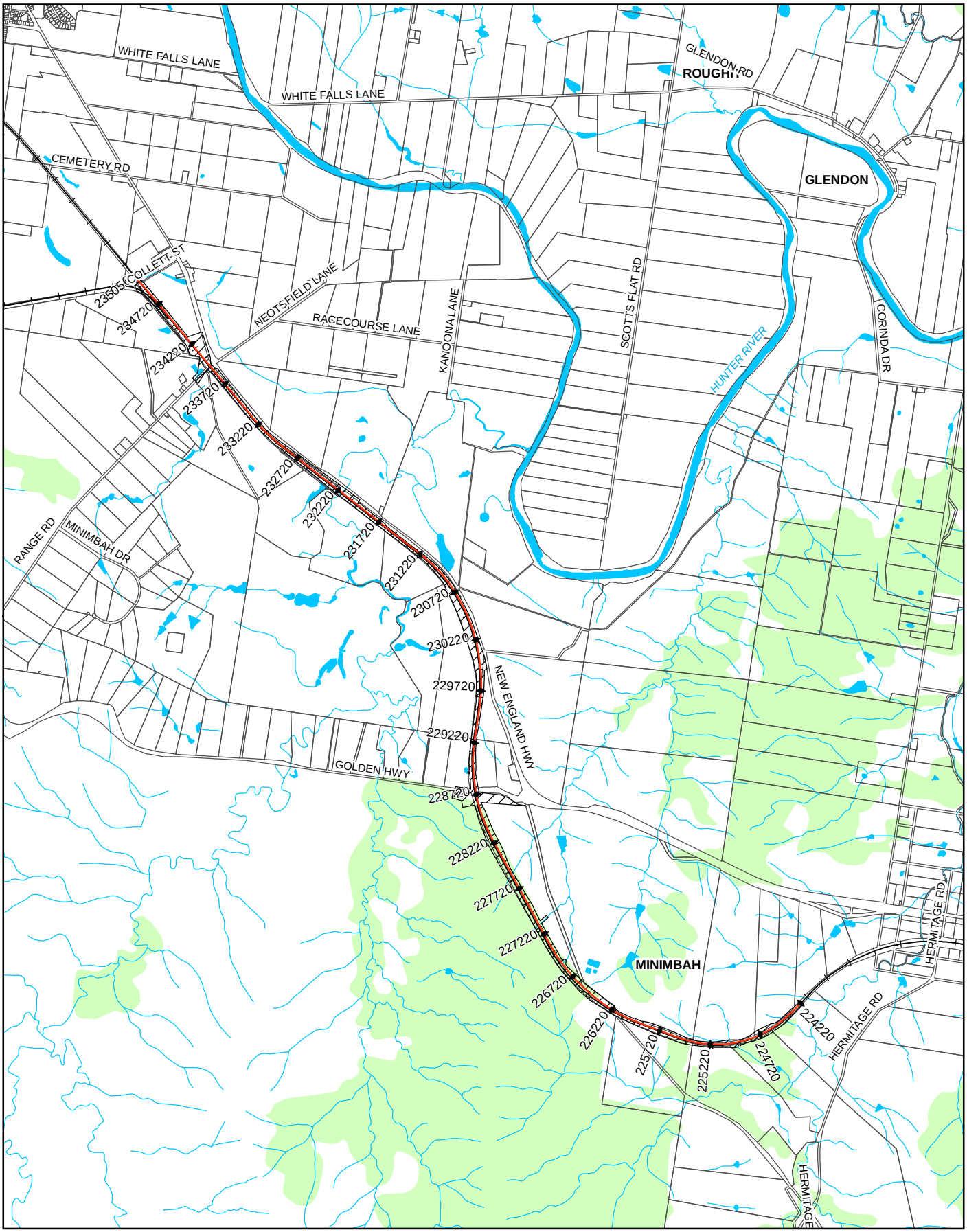
The proposed construction works for the Project would be predominately in the widened rail corridor between the Project extents previously listed. The impacted construction zone for the Project is illustrated in Figure 2-7.

Figure 2-8 illustrates the Project's extent of works, proposed site access, construction compound locations and spoil locations. ARTC have not yet engaged or consulted a Contractor to determine this methodology. Therefore the nominated methodology would be refined once a Contractor is appointed by ARTC.

The main construction activities for construction works include:

- Site Establishment;
- Major earthworks comprising of:
  - Major cut from approximate chainage 224.000 km to 229. 000 km (Up side);
  - Major fill from approximate chainage 229.000 km to 231.300 km (Up side);
  - At Grade from approximate chainage 231.300 km to 235.070 km consisting of minor cut and fill (Up side); and
  - Construction of the down side maintenance access road from approximate chainage 224.220 km to 235.070 km consisting of major cut and fill.
- Retaining wall construction between road and rail corridors between chainages approximate chainage 230.190 km and 230.730 km;
- Drainage works (cross drainage and longitudinal drainage);
- Golden Highway overbridge replacement works:
  - New bridge;
  - Road realignment; and
  - Demolition of old bridge/ road.
- Mudies Creek under bridge;
- Range Road overbridge works and road realignment;
- Major culvert underbridge works (approximate chainage 234.240 km);
- Signalling;
- Track work including track slews, turnouts, track sleepers and ballast; and
- Commissioning.

These elements are described in further detail in the following sections.



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Project Route
Existing Rail
Watercourse
Forest Or Shrub
Cadastre
Impacted Construction Zone

1:50,000 for A4

0 200 400 800 1,200 1,600

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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ARTC - Minimbah Third Track
Environmental Assessment

Project Route &
Impacted Construction Zone

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rev no. A

Figure 2.7

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2.2.2 Site Access

Primary and Secondary access points are proposed for entry and exit to the construction site as described below.

Primary Access

Two primary access points are proposed to serve as the main entry and exit points for site workers, plant, equipment and major material deliveries. The proposed primary access points are located adjacent to the Golden Highway and Range Road.

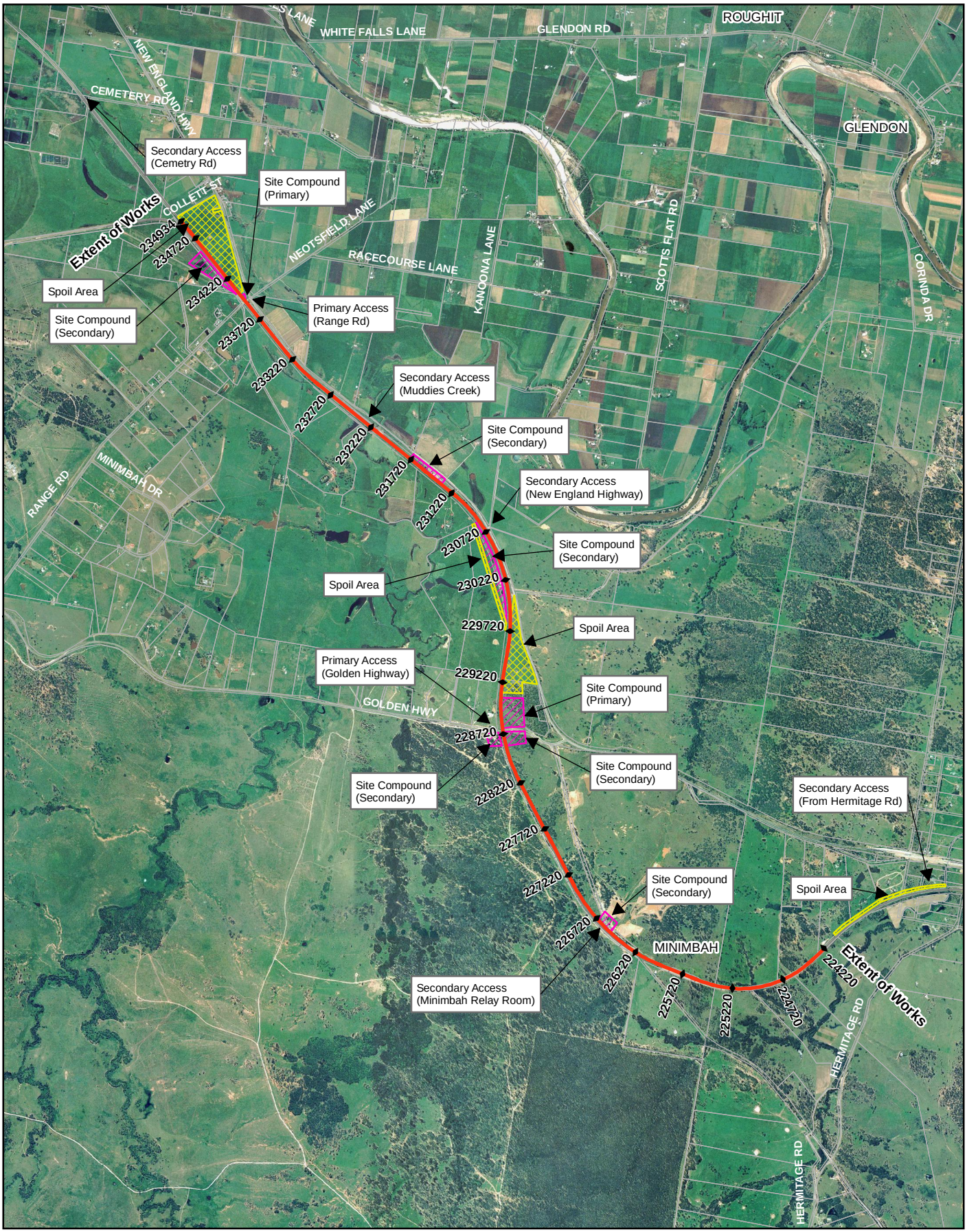
The Golden Highway access point would provide access to the rail corridor to both the Up and Down sides of the main line. This access would provide access to works south of the Golden Highway (approximate chainage 229.000 km – 224.000 km) and north of the Golden Highway (approximate chainage 229.000 km – 234.000 km). This location would provide access for major earthworks at the top of Minimbah Bank and for the construction of the proposed new Golden Highway overbridge and road realignment.

The Range Road access point would provide access to both the Up and Down sides of the existing line as well as access to works south of Range Road (approximate chainage 234.000 km – 229.000 km) and north of Range Road (approximate chainage 234.000 km – 235.500 km). This location would provide access for the construction of Range Road grade separation as well as major earthworks north of the Golden Highway.

Secondary Access

Secondary access points are proposed to be used for access to localised works, material supply and emergency access/egress to the construction site and rail corridor. The nominated secondary access points for the construction site are as follows.

- Hermitage Road level crossing at Belford approximately 2 km south of the extent of Project works;
- Existing rail maintenance access points adjacent to the Minimbah Relay Room, with right of way access through one private property from the Golden Highway; and
- Existing maintenance access to the rail corridor off the New England Highway approximately 1.7 km west of the Golden Highway.



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LEGEND

Project Route | Existing Rail | Cadastre | Site Compound | Spoil Area

1:50,000 for A4

0 215 430 860 1,290 1,720

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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ARTC - Minimbah Third Track Environmental Assessment

Site Access and Compound Areas

17 | September 2008

job no. 22-13755
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Figure 2.8

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2.2.3 Site Establishment

Site Compound Areas

Primary and secondary site compounds have been identified for the construction phase of the Project. Primary compounds would predominately be used for site offices, amenities, storage of major plant and equipment and storage of materials. Primary compounds would be located in close proximity to major construction sites and would provide adequate access and sighting for the Project.

Secondary site compounds would be predominately used for storage of minor plant, equipment and materials. Nominal amenities may also be provided in these locations. Secondary site compounds would also be located in areas close to major construction works. However, the area of secondary site compounds would generally be smaller than primary site compounds.

The locations of site compounds are described below and illustrated in Figure 2-8.

Location of Primary Site Compounds

There are two proposed primary site compounds:

- On the Up side of the existing line, at the northern corner of the Golden Highway and the mainline (on leased land); and
- On the Up side of the existing line, adjacent to the proposed Range Road overbridge (within the widened corridor).

Location of Secondary Site Compounds

There are five proposed secondary site compounds:

- On the Up side of the existing line adjacent to the Minimbah Relay Room (on leased land);
- On the Up side of the existing line, at the southern corner of the Golden Highway and the mainline (on leased land);
- On the Down side of the existing line, at the southern corner of the Golden Highway and the mainline (on leased land);
- On the Down side of the existing line between approximate chainages 229.800 km and 231.000 km (within the widened corridor); and
- On the Down side of the existing line, adjacent to the Whittingham Relay Room (existing storage area for rail maintenance) (within the widened corridor).

2.2.4 Major Earthworks

Extent of Cut and Fill

Where feasible, construction material for the rail earthworks would be sourced from the area within the new rail corridor boundary. The concept design indicated that there would be excess fill on site. This material would need to be appropriately disposed of off-site or spoiled on site during construction or at the completion of the Project. Where the quantity and quality of the embankment select and capping material is not adequate for construction, material would be imported.

Haul Road

Construction of the Project would require the construction of temporary haul roads for the transport of fill material, sourced within the construction site. These roads would generally be contained within the construction site.

Within the construction site the rail corridor crosses two public road corridors and a private crossing. Construction is to be sequenced to minimise the impact on the public usage of these roads. It is envisaged that for short durations during construction, construction vehicles would need to cross these roads. During these periods the crossing of these roads would be managed in accordance with the construction contractor's Traffic Management Plan and include full time traffic control.

Plant and Equipment for Earthworks

It is expected that the following plant and equipment would be required for the earthworks:

- Bull dozers;
- Excavators;
- Dump trucks;
- Water trucks;
- Low loaders;
- Truck and quad-axle "dog" trailers;
- Rigid table-top trucks;
- Rigid heavy vehicles;
- Semi-trailers;
- Concrete Trucks; and
- Passenger cars / light commercials.

The Traffic and Transport Assessment included in Appendix I estimated that the Project would generate a peak of 271 truck movements per day, with movements over 250 per day continuing from approximately Month 1 to Month 13 of an approximate thirteen month construction program.

2.2.5 Water Sources

Table 2-1 identifies existing water sources that may be utilised for Project construction. Which of these sources is to be used during construction would be determined the construction contractor.

Table 2-1 Water Sources for Construction

Water Source	Location	Diameter
Private Irrigation Line	Crosses rail corridor at approximate chainage 226.220 km	200 mm
Private Irrigation Line	Crosses rail corridor at approximate chainage 226.160 km	400 mm
Private irrigation line and weir at Mudies Creek (Lot 1 / DP 1113555)	Crosses rail corridor at approximate chainage 231.205 km	150 mm
Private dam (Lot 1/ DP 86239)	chainage 231.215 km	
Private Property currently being Acquired by ARTC (Lot 2 / DP 571523)	Acquisition includes a 56 megalitre water license from Doughboy Hollow (approximate chainage 234.240 km)	
Singleton Council Water Main - Golden Highway	Crosses rail corridor at chainage 228.770 km	150 mm
Hunter River	Water may also be available from the Hunter River. The contractor would be responsible for arranging the appropriate approvals to access water from the Hunter River.	

Spoil Locations

Four potential locations for the stockpiling or disposal of excess spoil have been identified. These are as follows:

- On private property adjacent to the Up side of the existing line between approximate chainages 229.300 km and 230.000 km;
- On private property adjacent to the Up side of the existing line between approximate chainages 234.300 km and 235.000 km;
- Within the rail corridor on the Down side of the existing line between approximate chainages 229.000 km and 231.000 km;
- Within the rail corridor on the Up side of the existing line between chainage approximate chainages 224.000 km and Hermitage Road (222.000 km). Spoil in this location would be used for future ARTC earthworks projects in the Hunter Region; and
- ARTC property at the corner of Range Road and the eastern side of the corridor.

If these spoil locations prove to be insufficient during construction, excess fill material would be disposed of through the following means.

- Use in the construction of drainage structures (such as dams) in low lying areas of the Project, particularly on the Up side of the existing line between approximate chainages 231.000 km and 234.000 km;

- Dispose of excess fill to surrounding licensed waste management facilities;
- Make excess fill available to local councils; and
- Make excess fill available to local landowners.

2.2.6 Drainage

During construction of the Project, temporary sediment control measures would be established to contain all run-off within the affected area. The temporary sediment control measures proposed include sediment basins, silt fencing, catch drains and other methods as deemed appropriate.

The temporary sediment basins would be appropriately sized and located within the new rail corridor boundary to protect the adjoining private property. Should the location of the sediment basins be required outside the rail corridor, a lease for the use of the land during construction would be negotiated with the affected landowners. This would be the responsibility of the Contractor.

During construction, flow through the existing cross drains and within the existing waterways would be maintained at all times. Sediment control measures would be introduced to minimise the affect on adjacent waterways and drains from sedimentation caused by construction.

2.2.7 Private Property Access During Construction

Private vehicle access to surrounding private properties would be maintained throughout the construction program. If existing vehicle access routes are temporarily or permanently severed, alternate routes would be provided. This would be achieved by providing access roads for affected properties to Range Road, the Golden Highway and/or the New England Highway.

2.2.8 Indicative Construction Program

The indicative start date for the construction program is February 2009. The construction program is expected to take approximately 13 months, with an expected completion date of March 2010. The key activities to be undertaken within this construction period are:

- Project Establishment;
- Major Earthworks – Cut;
- Major Earthworks – Fill;
- Major Earthworks – At Grade;
- Down Side Maintenance Access Road;
- Signalling;
- Golden Highway Works;
- Mudies Creek Bridge;
- Range Road Works;
- Major Culvert; and
- Commissioning and Completion.

Note that at the time of writing this Environmental Assessment, ARTC has not confirmed the delivery model for the construction of the Project. Therefore, the methodology, sequencing and duration of this program is potentially subject to change upon confirmation of the delivery model and award of the construction contract. It should be noted however, that ARTC does not propose staging of construction of the Project. It would be constructed in one stage within the construction phase previously discussed.

The contract for construction is not expected to be awarded until late 2008 therefore, minimal input from construction contractors has been provided in preparation of this program.

2.2.9 Construction Hours

Standard hours of construction for the duration of the construction program are anticipated to be between 6:30 am and 6:00 pm, seven days per week. However, it is anticipated that throughout the construction program, specific activities would need to be completed outside of these hours to allow for works to occur in track possession periods where trains are not operating. These periods are generally for a period of 36 - 60 hours as discussed in Section 2.2.11. These activities may include, but are not limited to:

- Track possession works;
- Extended concrete pours;
- Excavation close to existing rail and road infrastructure;
- Piling of major structures; and
- Crane movements required for major structures.

2.2.10 Track Possessions

The delivery of the construction works is constrained by ARTC track possessions. Track possessions are scheduled track shut downs, which means that no trains run on the closed section of track during the scheduled possession. For the Minimbah Bank section of track, possessions occur approximately every three months and are usually 36 - 60 hours in duration.

Any construction work that directly impacts the running of trains on the existing line can only be completed during a track possession. For this Project, this would include as a minimum:

- Earthworks in close proximity to train operations;
- Installation and commissioning of track turnouts and track slews;
- Commission of all signaling infrastructure;
- Construction of critical elements for Range Road overbridge;
- Construction of critical elements for Golden Highway overbridge; and
- Demolition of the existing Golden Highway overbridge.

Work within track possessions would be executed around the clock (24 hours per day). This is due to the criticality and quantity of works to be completed in track possessions, and the infrequent scheduling of track possessions. It should also be noted that track possessions are required to complete the construction works due to requirements for commissioning of track and signalling works.

Current track possessions scheduled by ARTC potentially applicable to the construction of the project are detailed in. These possession dates, times and durations are currently under review and may alter.

Table 2-2 Scheduled Track Possessions

Scheduled Track Possession	Start Date / Time	Finish Date / Time
March 2009	12/03/2009 – 0730 hrs	13/03/2009 – 1930 hrs
May 2009	14/05/2009 – 0730 hrs	15/05/2009 – 1930 hrs
August 2009	13/08/2009 – 0730 hrs	14/08/2009 – 1930 hrs
November 2009	19/11/2009 – 0730 hrs	20/11/2009 – 1930 hrs
March 2010	12/03/2010 – 0730 hrs	13/03/2010 – 1930 hrs

2.3 Major Infrastructure Elements

2.3.1 Golden Highway Overbridge Replacement

The Golden Highway is a classified state arterial road that links the Hunter Valley and Dubbo. As part of the Project, a new bridge is required on the Golden Highway to span across the Main Northern Railway. This is required due to the current condition of the existing bridge, the required structural clearances, the additional length of bridge required to span the proposed third track, and the requirement to minimise construction impacts on the existing rail traffic.

The 35 m concrete bridge would span over the three rail tracks. The bridge deck would comprise of a concrete deck and prestressed precast super T-girders allowing minimal construction to be completed over or adjacent to the operating tracks. The cross section of the bridge would allow for two 3.5 m wide traffic lanes and two 3.0 m shoulders.

The embankments at each abutment would be reinforced soil walls with vertical precast panel facing running parallel with the existing and proposed rail alignment. The abutment walls would be arranged to allow adequate clearance to the existing tracks during construction.

The general arrangement of the Golden Highway Bridge structure is represented on drawing ARTCN1080030500 in Appendix C.

To maintain traffic flow on the Golden Highway, the Golden Highway overbridge replacement is being positioned on a revised Golden Highway alignment. The realignment would be a relatively straight length of road (approximately 700 m) commencing west of the existing abattoir access / rest area intersection with the Golden Highway and realigning with the existing Golden Highway to the rest of the Main Northern Railway.

The primary access for the Golden Highway construction works would be from the Golden Highway to the site compound areas nominated on Figure 2-8 and Section 2.2.2. Compound areas would accommodate site sheds, materials, plant and equipment for construction. The imported materials required to construct the Golden Highway overbridge include:

- Select fill and pavement materials;
- Concrete and reinforcement for the in-situ bored piles;
- Concrete and reinforcement for the abutment headstocks;
- Precast concrete bridge deck girders;
- Concrete to construct bridge approach slabs;
- Precast concrete panels for the abutment walls; and
- Earthworks for the approach roadwork.

Construction of the overbridge would be coordinated with rail operations. Rail track possession (refer to Section 2.2.11) for the work over the track would also be utilised as required.

Construction of the Golden Highway realignment would be in accordance with a RTA *Works Authorisation Deed*. Traffic flow on the Golden Highway would be maintained throughout the construction of the realigned section, with traffic control in accordance with the RTA Traffic Control at Worksites Manual. The contractor would have to prepare a Construction Management Plan to be approved by the RTA.

Demolition of the existing Golden Highway overbridge is scheduled to be completed after the new bridge and road works are open to traffic. Demolition material would be removed from site and disposed of appropriately (refer to Section 14.5).

2.3.2 Mudies Creek Underbridge

Mudies Creek is a tributary of the Hunter River and is affected by flooding caused by backwater flood events within the Hunter River. Mudies Creek passes underneath the existing rail corridor at approximate chainage 232.220 km, and continues east underneath the New England Highway.

The existing Mudies Creek underbridge currently supports both the existing Up and Down Main lines. This existing bridge is in good condition and would be retained. An additional bridge structure is required to support the proposed third track and would be located adjacent to the existing bridge structure.

The four (4) span concrete bridge would span over the existing Mudies Creek. The span lengths would vary in length between approximately 10.7 m and 12.0 m. The bridge deck would comprise of concrete precast bridge planks, supported on concrete bored piles and columns at intermediate piers and abutments.

The embankments at each abutment would be supported by reinforced concrete retaining walls extending the existing brick abutment walls.

The general arrangement of the Mudies Creek underbridge structure is represented on drawing ARTCN1080030400 in Appendix C.

The primary access for the Mudies Creek underbridge construction would be from the New England Highway using an existing property entry to the site compound areas nominated on Figure 2-8 and as described in Section 2.2.2.

The imported materials required to construct the Mudies Creek underbridge include:

- Concrete and reinforcement for the in-situ bored piles;
- Concrete and reinforcement for the abutment and pier headstocks;
- Precast concrete bridge girders;
- Concrete and reinforcement for bridge approach slabs;
- Concrete and reinforcement to construct abutment walls and columns;
- Imported rock for scour protection; and
- Fabricated steel walkways.

Construction of the underbridge would be undertaken with minimum impact to the existing structure and the rail operations.

2.3.3 Range Road Overbridge

Range Road is a rural collector road that links the New England Highway to the Golden Highway at Whittingham. The existing level crossing on Range Road currently crosses the two existing rail lines and is controlled by active controls in the form of boom barriers and flashing lights. As part of the Project, the existing Range Road level crossing would be closed and replaced with a grade separated crossing to the north of the existing level crossing. As part of these works, a new intersection with the New England Highway would be required to the north of the existing intersection.

The 33 m concrete bridge would span over the three rail tracks. The bridge deck would comprise of a concrete deck and prestressed precast super T-girders allowing minimal construction to be completed over or adjacent to the operating tracks. The cross section of the bridge would allow for two 3.75 m wide traffic lanes and two 3.0 m shoulders.

The embankments at each abutment would be reinforced soil walls with vertical precast panel facing running parallel with the existing and proposed rail alignment. The abutment walls would be arranged to allow adequate clearance to the existing tracks during construction.

The general arrangement of the Range Road overbridge structure is represented on drawing ARTCN1080030300 in Appendix C.

The primary access for the construction of Range Road works would be from Range Road to the site compound areas nominated on Figure 2-8 and Section 2.2.2. Compound areas would be used to accommodate site sheds, materials, plant and equipment for construction. The imported materials required to construct the Range Road realignment and overbridge include:

- Select fill and pavement materials;
- In-situ concrete and reinforcement for the piles and footings;
- Concrete and reinforcement for the abutment headstocks;
- Precast concrete bridge deck girders;

- Concrete to construct bridge approach slabs
- Precast concrete panels for the abutment walls; and
- Earthworks for the approach roadwork.

Construction of the Range Road overbridge would be coordinated with rail operations. Rail track possession for work over the track would also be utilised as required.

Construction of the proposed intersection of New England Highway / Range Road intersection would be in accordance with a RTA *Works Authorisation Deed*. Traffic flow would be maintained on the New England Highway during construction.

2.3.4 Major Culvert Works

The northern end of the Project is within a low-lying area prone to flooding. There is an existing major culvert and flood relief structure at approximate chainage 234.240 km, which supports the existing Up and Down Mains.

The proposed third track at this location would be offset from the existing Up Main by approximately 6.5 m. Therefore, a new major culvert is required to be constructed as part of the Project. This major culvert would be located adjacent to the existing culvert, minimising impact on the existing structure, existing rail traffic, and to minimise the impacts due to the new structure.

The four (4) span concrete bridge would span over the existing creek. The superstructure would consist of four (4) spans varying in length between approximately 4.9 m and 5.3 m. The waterway area provided for the new structure is approximately 1.2 m deep by 4.3 m wide by four openings, matching the existing structure. The bridge deck would comprise of concrete precast bridge planks supported on shallow piers and abutments over bored pile foundations. The embankments would be supported by the abutments at the end of the structure. The abutments would match the existing structure.

The general arrangement of the major culvert structure at approximate chainage 234.240 km is represented on drawing ARTCN1080030100 in Appendix C.

The primary access for the construction works for the bridge work would be from Range Road. The site compound areas nominated in Figure 2-8 and Section 2.2.3 would accommodate site sheds, materials, plant and equipment for construction. The imported materials required to construct the major culvert include:

- In-situ concrete and reinforcement for the bored pile foundations, piers, and abutments, invert slab and wing walls;
- Precast concrete bridge deck units;
- In-situ concrete and reinforcement for bridge approach slabs; and
- Fabricated steel walkways.

2.3.5 Retaining Wall

The New England Highway retaining wall would be required between the proposed Up Relief and the New England Highway at approximate chainage 230.200 km. The retaining wall would

prevent the new embankment spilling onto the New England Highway. Some shoulder widening and traffic barriers would be required on the New England Highway to suit the retaining wall and drainage requirements at this location. The retaining wall designed is a 550 m long gabion faced reinforced soil wall with a maximum height of 4.5 m above the existing road level.

The proposed retaining wall would be a rock gabion basket faced reinforced soil wall. The location of the wall has been governed by the location of the boundary between ARTC and RTA properties.

The general arrangement of the retaining wall structure is represented on drawings ARTCN1080030600 to ARTCN1080030603 in Appendix C.

The primary access for the construction works for the retaining wall structure would be from the corridor along side of the New England Highway. Consideration to adequate traffic control measures would need to be adopted for work near the New England Highway. The site compound areas nominated in Figure 2-8 and Section 2.2.3 would accommodate site sheds, materials, plant and equipment for construction. The imported materials required to construct the retaining wall include:

- Gabion baskets;
- Rock fill for gabion baskets;
- Soil reinforcing geofabric;
- Structural backfill for the reinforced soil wall;
- Draining materials including pipes, geotextile fabrics and aggregate; and
- In-situ concrete and reinforcement for the draining trench.

2.3.6 Key Waterway Crossings

Little Doughboy Hollow

In order to accommodate the new track the existing culvert spanning Little Doughboy Hollow is being duplicated. The new culvert has been designed such that its longitudinal profile is consistent with that of the existing structure. The structure would therefore have minimal impact upon the velocity and water level of Little Doughboy Hollow.

A flood study for this catchment has confirmed that the proposed bridge would have minimal impact on the flood level at this location.

Mudies Creek

As discussed in Section 2.3.2, Mudies Creek underbridge is also being duplicated to accommodate the new track. As with the culvert at Little Doughboy Hollow, the new Mudies Creek underbridge has been designed such that its longitudinal profile is consistent with that of the existing structure and would therefore have minimal impact upon the velocity and water level of Mudies Creek.

To minimise erosion rock mattress scour protection would be provided below and adjacent to the existing and proposed Mudies Creek bridge structures. A smooth transition would be provided to the existing creek alignment to minimise the impact to water flows.

Culvert B Extension and Drainage Line Realignment (225.020 km)

The earthworks required for the proposed new track would partially fill a tributary for the existing culvert at 225.020 km. The drainage line would therefore be realigned to maintain a controlled flow path for water within this tributary to culvert 'B'.

The flow depth and velocities for the relocated section of drainage line have been determined to be within the project criteria. The drainage line diversion would be rock lined scour protection to minimise erosion.

2.4 Operation

Existing Rail Operations

Information on the existing rail traffic through Minimbah Bank was sourced from ARTC. This information indicated the following:

- Coal train rail traffic is approximately 49 trains (in each direction) on peak days. Data records for the period pf 13 March to 2 April 2008 indicated peak train movements of 45 on the Up line and 43 on the Down line;
- Other rail traffic is approximately 7 train movements (in each direction) comprised of the following:
  - Three grain trains;
  - Three Hunter Railcar suburban passenger train (Newcastle to Scone / Muswellbrook); and
  - One Countrylink XPLORER diesel railcar intra-state passenger train.

The average coal train size is approximately 6,620 tonnes per train, comprising approximately 66 laden wagons driven by 3 locomotives. A typical wagon is approximately 16.7 to 16.9 m in length. Coal train sizes can be as large as 91 laden wagons.

Locomotives pulling the coal trains are typically a coupled mix of Class 82 or Class 90 locomotives, operated by Pacific National or Queensland Rail (QR):

- Class 82 – JT42C Model Electro-motive Diesel Locomotive with an EMD 12-710G3A engine; and
- Class 90 Locomotive – EMD GT46CWM Model Electro-motive Diesel Locomotive with an EMD 16-710G3A engine.

Future Rail Operations

The improved headways provided by the Project, together with the increased production of coal and an increased capacity of the Port of Newcastle are anticipated to generate an increase in rail traffic passing through Minimbah Bank. The predicted coal train traffic (in each direction) is predicted by ARTC to increase as follows:

- 2009: 53 train movements;
- 2010: 57 train movements; and
- 2020: 70 train movements.

Maintenance Activities

During the operation of the Project, ongoing maintenance activities would need to be undertaken. Minor maintenance works on associated infrastructure could potentially be undertaken throughout the operations. However, where safety requirements require the closure of the line to rail traffic, maintenance activities would be undertaken during scheduled track possessions that occur every three months, as discussed in Section 2.2.11.

Typical maintenance activities may include:

- Rail welding;
- Re-railing;
- Rail grinding;
- Tamping;
- Ballasting;
- Track re-conditioning;
- General maintenance of drainage structures;
- General maintenance of access roads and embankments; and
- Signal maintenance.

3. Consultation

3.1 Consultation Activities during the Environmental Assessment

3.1.1 Objectives

The objectives of the consultation activities during the concept design phase and the preparation of the Environmental Assessment for the Project were:

- To provide information about the Project and the planning process to landowners potentially affected by the upgrade and to other key stakeholder groups, including the wider community;
- To provide stakeholders with the opportunity to express their views about the Project; and
- To identify design and environmental management issues and suggestions.

3.1.2 Consultation Activities

Consultation activities commenced in February 2008 at the start of the concept design and environmental assessment process. Consultation has involved providing the stakeholders, with information as well as providing opportunities for input with respect to their issues and concerns. Key stakeholders targeted included:

- Landowners with properties affected by the project or within close vicinity of the Project;
- Singleton Council;
- Statutory agencies; and
- The broader community.

The following activities were implemented to provide the community with a range of ways to contact the Project team, gain access to information and provide comment.

Contact and Feedback Mechanisms

Information line:	1800 684 490
Email:	Email contacts of the GHD project team were provided to landowners.
Website:	www.artc.com.au

Contact and Issues Database

A contact database was set up to manage the contact details, contacts made and the issues raised by stakeholders. The issues raised are identified in Section 0.

Fact Sheet

A fact sheet entitled 'Minimbah Third Track Fact Sheet 1 (March 2008)' was prepared to inform landowners about the Project. The fact sheet was distributed to potentially affected landowners at a face-to-face meeting with them or sent to them following a telephone conversation.

The fact sheet contained information about the reasons for the Project, the proposed program, the proposed works, the preliminary findings of the Environmental Assessment, the areas of investigation in the detailed Environmental Assessment, and information on compensation. Contact details were also provided.

Community Newsletter

A community newsletter entitled 'Third Rail Track – Community News Number 1 (April 2008)' was prepared to inform the wider community about the project.

The newsletter contained information about the reasons for the Project, the proposed program, the proposed works, the preliminary findings of the Environmental Assessment, the areas of investigation in the detailed Environmental Assessment. Contact details were also provided.

The newsletter was distributed via a letterbox drop to landowners in the vicinity of the Project. Approximately 100 copies were distributed.

Copies of the update were also made available at the following locations:

- Singleton Council Administration Building; and
- Singleton Library.

Meetings with Landowners

Landowners included private owners, Singleton Council and State and Federal government agencies.

Potentially affected landowners and landowners in close vicinity to the Project were sent a letter to make them aware of the Project and to ask them for consent to enter their property for various investigations (if required).

These landowners were then contacted to arrange a face-to-face meeting to discuss the Project and its likely impacts on their properties.

In the first phase of meetings, to introduce the Project, thirty meetings with landowners took place with a further four telephone contacts. The purpose of the contacts was to:

- Introduce the Project;
- Provide information on the likely third track alignment and other changes;
- Where and how it may impact on their properties;
- Discuss access issues (where relevant);
- Identify any environmental issues of concern; and
- Provide information on the compensation process.

These contacts provided an opportunity to capture information at an early stage of the Project.

Dependant on the issues at hand several meetings have been undertaken with each affected landowner to discuss land acquisition and restoration issues. These meetings have been ongoing since March 2008.

Since these initial meetings with landowners, extensive consultation has been undertaken with directly affected landowners primarily related to financial compensation due to partially acquired land as a result of the Project. Targeted mitigation measures as identified by individual landowners have been established through the negotiation process with affected landowners. These measures include relocation and replacement of dams, bores, fences and trees. These issues are discussed in Section 9.

Aboriginal Community

The Project area lies within the boundaries of the Wanaruah Local Aboriginal Land Council (LALC) and within an area of interest to other Aboriginal persons and organisations (Kuskie, 2008). Consultation and involvement of the Aboriginal community was undertaken as per the requirements of the DECC policy entitled *Interim Community Consultation Requirements for Applicants*.

Consultation was undertaken with the local Aboriginal community throughout the Environmental Assessment process as part of the Aboriginal Heritage Impact Assessment (Appendix F). This involved:

- Establishing if any Aboriginal persons/ organisations wanted to be consulted about the Project;
- Liaising with those interested Aboriginal persons/ organisations;
- Placing media advertisement in the local press (as per DECC guidelines) requesting that interested Aboriginal persons/ organisations register their interest in writing;
- Providing detailed information about the heritage impact assessment, including proposed methodology to the interested Aboriginal persons/ organisations;
- Inclusion of comments received from registered Aboriginal persons/ organisations in the final assessment methodology;
- Field inspection with the registered Aboriginal stakeholders;
- Notifying registered Aboriginal stakeholders and the LALC of the availability of the draft Aboriginal heritage impact assessment report and their comments invited;
- Preparation of a final Aboriginal heritage impact assessment report and addressing and incorporating Aboriginal stakeholder input. This is included in Appendix F; and

Further details on the outcomes of this consultation are included in Appendix F.

Contacts Made Through the Contact Mechanisms

Minimal contacts have been received from the wider community about the Project through the 1800 number and email process. The majority of contacts made through these mechanisms have been received from affected landowners wanting information on land acquisition issues and follow up on their concerns on the track design and its potential impact on their land and their operations. Methods and numbers of contacts received are outlined in Table 3.1.

Table 3-1 Summary of Community Contacts

Method of Contact	Number of Contacts
Project hotline	25
Project email	10

3.2 Landholder and Community Issues

3.2.1 Key Issues and Comments Raised

Key issues raised throughout the consultation phase are summarised below in . These issues are cross-referenced to where they are addressed in the Environmental Assessment.

Table 3-2 Key Landowner and Community Issues and Comments

Main Issue/Comment		EA Reference
ARTC's track record in community consultation	◗ Issues raised about ARTC's commitment and responsiveness to the needs of the local community. Lack of consultation on decisions made in the past, in relation to capital and maintenance activities.	Section 3
Noise/Vibration	◗ Noise mitigation for houses or services located close to the existing track and the proposed third track;	Section 10
	◗ Increased number of trains;	Section 14.1.1
	◗ Poor train maintenance resulting in increased noise, such as, poor sound suppression, flat wheels; and	Section 10
	◗ Noise attenuation at specific points along track needs investigation.	Section 10
Property access issues	◗ Access to properties off Range Road, if road design changes;	Section 2.3.5
	◗ Access for properties onto Golden Highway; and	Section 2.3.5
	◗ Main and alternate property access in flooding, for properties reliant on structures likely to be affected by flood waters.	Section 11.2.1

Main Issue/Comment		EA Reference
Property impacts and land acquisition	◗ Landowners with specific services on land impacted by third track require the services to be relocated, such as, location of dams, drainage pipes etc; ◗ Affect of third track location on future value and land usage of specific properties; ◗ Wanting mitigation for noise and light from trains; and ◗ Concerns about maintaining fences and gate closures whilst construction undertaken on acquired land.	Section 2.1.7 Section 9.2.1 Section 10.3 Section 9.3.1
Design of proposed overpass at Range Road	◗ Location and dimensions of flyover; ◗ Air safety; ◗ Change of access to properties for landowners; ◗ Noise increase from trucks due to bridge structure; ◗ Lights from traffic will be more prominent to houses within close vicinity; and ◗ Privacy issues due to height of bridge.	Section 2.2 Section 14.2 Section 2.2.1 Section 10 Section 13 Section 13
Protected species	◗ Aim to identify and investigate all protected species.	Section 7 Appendix E
Aboriginal heritage	◗ Aim to investigate all items or places of Aboriginal heritage.	Section 8 Appendix F
Location of proposed embankment	◗ Access to specific property.	Section 9.3.2
ARTC access roads	◗ Concerns about vandals accessing private property via these roads.	N/A General ARTC Issue
Increased flooding from new rail structures	◗ Fear of increased flooding as a result of third track design; ◗ Concerns that current flooding is largely due to location and design of current track, design of culverts, poor track maintenance etc; and ◗ Need for more causeways.	Section 11 Section 11 Section 11.3
Impact on existing utilities	◗ Concerns about the impact of the third track on existing utilities in location of the alignment; and ◗ Concerns about construction activities impacts on utilities.	Section 2.1.7 Section 2.1.7

Main Issue/Comment		EA Reference
Information on impacts on land currently for sale	◗ Potential impacts on land of interest to prospective buyers.	Section 9.2.1

3.3 Agency Consultation

Consultation has been undertaken with the following agencies as part of the environmental assessment process:

- The Roads and Traffic Authority (RTA);
- Department of Water and Energy (DWE);
- Department of Primary Industries (DPI);
- Department of Environment and Climate Change (DECC);
- Singleton Council; and
- Department of Defence.

Table 3-3 outlines the method of correspondence, the key issues raised that are relevant to the environmental assessment and where these issues are considered in this environmental assessment. Correspondence with the RTA, DWE, DPI, DECC and the Department of Defence are included in Appendix A, following the DGR's.

Table 3-3 Agency Consultations

outlines the method of correspondence, the key issues raised that are relevant to the

Agency	Issue	EA Reference
Roads and Traffic Authority		
Letter (18 February 2008) – attached as Appendix A	New England Highway/ Range Road Intersection requirements	Section 2.3.3
	Realignment of Golden Highway requirements	Section 2.3.1
	Traffic Management Plan required	Sections 2.2.4, 9.3.2 and 9.4.2
	Maintenance of access to existing properties	Section 9.3.3
	A *Works Authorisation Deed* with the RTA will need to be executed to enable review of the proposed design and construction works.	Section 2.3.1

Agency	Issue	EA Reference
Department of Water and Energy		
Letter (10 April 2008) – attached as Appendix A	Management, replacement and relocation of existing farm dams	Section 11.2
	Management, replacement and relocation of groundwater bores	Section 11.3
	Diversion of creeks and waterways	Section 11.3
Meeting (11 June 2008) – attached as Appendix A	DWE advised that under the Water Management Act 2000, ARTC is exempt from waterway works/diversion application requirements, with works defined as a "Controlled Activity Order".	Section 6.3.10
Department of Primary Industries		
Letter (9 April 2008) – attached as Appendix A	Identify area to be affected and waterbodies and waterways within the area.	Section 6.3.2, 6.3.8, 7 and Appendix E.
	Dredging and reclamation activities, marine vegetation, fish passage, fishing and aquaculture	
	Threatened species	
Department of Environment and Climate Change		
Letter (11 April 2008) – attached as Appendix A	Threatened species and EEC's	Section 7 and Appendix E
	Aboriginal cultural heritage impacts	Section 8.3 and Appendix F
	Noise and vibration impacts	Section 10.3 and Appendix G
Singleton Council		
Meeting between GHD and Singleton Council on 7 May 2008.	Flooding – Consultation required with DECC and DWE	Table 3-3
	European Heritage (Main ones are Baroona and Minimbah House).	Section 14.3
	Increased and/or decreased travel time for local residents associated with changes to train movements and level crossings	Section 14.4
	Construction traffic – Range Road, access to rural residential	Section 2.2.2 Section 9

Agency	Issue	EA Reference
Department of Defence		
Various (letter, emails, phone conversations)	ARTC has had ongoing discussions with the Department of Defence since February 2008 regarding the Project. The current status (as at 19 September 2008) is that ARTC has lodged a formal letter regarding the acquisition of the affected portion of land and is awaiting a response from the Department of Defence.	Section 9.3

3.4 Utility Provider Consultation

Close consultation with each of the affected service utilities has been undertaken since commencing concept design in September 2007. These utilities and the status of their discussion are outlined in Table 3-4.

Table 3-4 Utility Providers

Service Provider	Status of Discussion
Energy Australia	Energy Australia has completed design for the required Energy Australia infrastructure relocations. A contract for the relocations has been approved by ARTC. It is expected that the majority of the relocations will be completed by the end of 2008.
Telstra	Telstra completed an 'Impact Identification Report' on August 15 2008 and is currently undertaking a 'Scope of Works Report'. Upon completion of this report Telstra will engage an accredited contractor to carry out the relocation works. The Telstra relocation works are scheduled for completion by the end of 2008.
AAPT	AAPT (formally Powertel) has engaged an accredited contractor to relocate an AAPT Sydney – Brisbane optical fibre cable that is impacted by the Project. The AAPT relocation works are expected to be complete by the end of the year.

Service Provider	Status of Discussion
RailCorp	A number of meetings with RailCorp have been held since commencing concept design for the Minimbah Project. RailCorp has conveyed conceptual approval for the proposed relocation of a RailCorp owned CCTV optical fibre cable. In accordance with RailCorp's standard procedure a 'Configuration Change Request' is currently being prepared for formal approval of the RailCorp services relocation works.
Singleton Council	Singleton Council has advised of their requirements regarding the relocation of a Council owned water main adjacent to the Golden Highway. Further consultation with Council would be undertaken prior to relocation of the subject water main during the detail design phase.
Private Irrigation Mains	Owners for each of the identified irrigation mains have been consulted. Further consultation with these owners would be undertaken prior to carrying out any relocation works during the detail design phase.
Alinta	Alinta has been consulted in regards to a gas main adjacent to the Project. Through this consultation it has been confirmed that there is no known gas main within the Project impact area.

3.5 Next Steps for Consultation

Public Exhibition

Department of Planning will place the Environmental Assessment on public exhibition for at least 30 days. During the exhibition period, submissions will be invited from relevant agencies and members of the public.

ARTC will respond to these issues and may modify the Project and the draft Statement of Commitments to minimise impacts on the environment if required.

If the Project or Statement of Commitments are modified in response to issues raised, a Preferred Project Report may be required to be prepared to describe the scope of the revised project. The Director-General of the Department of Planning may require that this report be made publicly available.

Assessment and Determination

Following the exhibition period, the Department of Planning will review the Environmental Assessment, submissions received and any Preferred Project Report. Once the Department of Planning has completed its assessment, a draft Assessment Report will be prepared for the Director-General of the Department of Planning, which may include recommended conditions of approval.

The recommended conditions will refer to the Statement of Commitments and may modify them and/or add additional provisions.

The Assessment Report will then be submitted to the Minister for Planning for determination. The Minister may refuse the Project, or approve it with any conditions considered appropriate.

The Minister's determination and the Director-General's report will be published on the Department of Planning's web site immediately following determination.

Consultation with the community and other stakeholders will be ongoing during the construction stages of the Project.

4. Environmental Risk Analysis

4.1 Introduction

The Director-General's requirements for the Environmental Assessment require that an Environmental Risk Analysis (ERA) be undertaken for the Project. The ERA is a process designed to analyse the Project's impacts, and to identify impacts that may not have previously been identified. Table 4-1 outlines the Director-General's requirements for the ERA.

Table 4-1 Environmental Risk Analysis Director-General Requirements

Environmental Assessment Requirements	Where Addressed
The Director-General's requirements for the Environmental Assessment require that an environmental risk analysis be undertaken for the Project. The environmental risk analysis is a process designed to analyse the Project's impacts, and to identify impacts that may not have previously been identified.	Section 4
The Environmental Assessment must include a risk analysis to identify potential environmental impacts associated with the Project (construction and operation).	Section 4
The Environmental Assessment must detail proposed mitigation and identify potentially significant residual environmental impacts after the application of the proposed mitigation measures.	Sections 7-14
Where additional key environmental impacts are identified through this environmental risk analysis, an appropriately detailed impact assessment of this additional key environmental impact must be included in this Environmental Assessment.	Section 14

4.2 Approach to Environmental Risk Analysis

An Environmental Risk Analysis (ERA) workshop was undertaken on 8 May 2008 and was attended by the Environmental Assessment work element managers.

An analysis was undertaken which:

- Identified environmental issues, including key issues in the Environmental Assessment requirements and other issues;
- Examined potential impacts and proposed mitigation measures in relation to the identified issue; and
- Examined residual impacts likely to remain after application of mitigation measures.

4.3 Key Issues

The key issues as identified by the DGRs (as discussed in Section 1.4.2) are:

- Ecology;
- Cultural Heritage;
- Land Use and Access;
- Noise and Vibration;
- Hydrology; and
- Soils and Geology.

4.4 Non-key Issues

Other non-key issues identified by GHD beyond the key issues requiring assessment were:

- Social and economic (including property acquisition);
- Visual amenity;
- Air quality and climate;
- Non-Indigenous heritage;
- Traffic and transportation;
- Energy and greenhouse;
- Resource conservation and waste management; and
- Risks and hazards.

As required by the DGRs, an ERA process was undertaken by GHD to consider if additional environmental issues should be assessed, and if any of the other issues identified by GHD should be assessed as key issues.

4.5 Conclusion

The ERA process identified one extra key issue, and two small additions to key issues, that were not identified in the Director-General's Requirements.

Visual Amenity has been identified as a new key issue for the following reasons:

- Increased height and width of the embankment and associated visual restrictions including:
  - Potential visual impact from residents along the New England Highway and view from Minimbah House and other surrounding residents; and
  - Potential visual impacts from persons travelling along the New England Highway.

The two new additions to key issues are:

- Contamination section within the Key Issue: Soils and Geology. Extra fieldwork is required to assess the contamination at the existing abattoir site; and
- Groundwater section within the Key Issue: Hydrology and Flooding. Groundwater sampling has been undertaken to assess the groundwater characteristics.

5. Strategic and Project Justification

5.1 Introduction

The Director-General's Requirements require a strategic and project justification as follows:

"*Strategically justify the project taking into consideration the objects of the Environmental Planning and Assessment Act 1979, the project's consistency with the aims and objectives of relevant State policies (State Plan, State Infrastructure Strategy) and the project objectives.*"

5.2 Strategic Justification with Regard to Objects of the *NSW Environmental Planning and Assessment Act 1979*

In accordance with the Director-General's Requirements, consideration has been given to the objects of the NSW *Environmental Planning and Assessment Act 1979* (*EP&A Act 1979*) as outlined below:

i. To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.

The Project would facilitate the proper development of natural resources, particularly coal, by improving the efficiency of the coal transportation system. The preferred route selection process and the development of the concept design have sought to minimise environmental and social impacts where feasible. The preferred route was chosen in preference to other options as it has a comparatively lower ecological impact, with a lesser extent of native vegetation to be removed. Additionally, the preferred route was selected, as it would not produce any additional fragmentation or isolation of remnant bushland, and would require comparatively less property acquisition and disruption to local communities.

The Project has been developed to minimise impacts to local biodiversity and ecological integrity. Where impacts would be imposed, mitigation measures have been developed in the concept design to reduce the scale and intensity of those impacts.

ii. To encourage the promotion and coordination of the orderly and economic use and development of land.

The development of improved infrastructure for the movement of coal would assist with the orderly use and development of land in the locality. The Project would not significantly affect the future orderly use or development of land.

iii. To encourage the provision of land for public purposes.

The Project would not directly result in the provision of land for public purposes, other than an improved rail infrastructure development, which indirectly benefits the wider community, including public transport commuters.

iv. To encourage the provision and coordination of community services and facilities.

The Project would improve the safety of the road environment of the Golden Highway and Range Road and would deliver an outcome that indirectly benefits the wider community. The Project would not impact on the provision of existing community services and facilities.

v. To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.

The concept design was developed with the inclusion of environmental management and mitigation measures. These measures are designed to limit the Project's impact on native flora and fauna species, with particular regard to threatened species, populations and ecological communities and their habitats. The route options development and preferred route selection phases involved preliminary environmental fieldwork, and background assessments to select the preferred route that best minimises impacts. Route selection was undertaken with the aim of avoiding areas containing threatened ecological communities, populations, species and their habitats.

vi. To encourage ecologically sustainable development.

The Precautionary Principle

This principle states that if there are threats of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The precautionary principle has played a key role in the development of the Project. From route option identification through to the concept design and environmental assessment, the precautionary principle has been applied. An assessment of the consequences of various options was undertaken as part of the route options identification process.

A number of specialist studies have been undertaken to identify potential impacts of the Project. Careful evaluation of collected information was undertaken to avoid serious or irreversible damage to the environment. Sufficient information has been gathered to allow an informed process to be implemented. This has allowed the development of appropriate mitigation measures as detailed in the Statement of Commitments (SoC) in Appendix B.

Intergenerational Equity

This principle states that the current generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

The Project has been developed to anticipate the needs of future generations, by developing and improving infrastructure for the coal industry and in turn the economic conditions in the area. This would have long-term benefits and is supported and encouraged by the State Plan and the State Infrastructure Strategy (refer to Section 5.3). Additionally, construction and operation of the Project would involve the implementation of mitigation measures to respond to any potential longer-term adverse impact on the environment (refer to Appendix B). These measures would assist with achieving the principle of intergenerational equity.

Conservation of Biological Diversity and Ecological Integrity

This principle requires that the diversity of genes, species, populations and communities, as well as ecosystems and habitats to which they belong, must be maintained and improved to enable their survival.

The preferred route selection process and the development of the concept design have sought to minimise the disturbance to native vegetation. The preferred route was chosen in preference to other options as it has a comparatively lower ecological impact, with a lesser extent of native vegetation to be removed. Additionally, the preferred route was selected, as it would produce any additional fragmentation or isolation of remnant bushland.

The Project has been developed to minimise impacts to local biodiversity and ecological integrity. Where impacts would be imposed, mitigation measures in the concept design have been developed to reduce the scale and intensity of those impacts. The mitigation measures to be implemented prior to, during and following construction, and continuing in the operation phase, have the purpose of minimising impacts on native fauna species, and therefore maintain biological diversity.

Improved Valuation, Pricing and Incentive Mechanisms

This principle requires that environmental factors should be included in the valuation of assets and services. The Project does not raise any issues that conflict with the principles of improved valuation, pricing and incentive mechanisms, and this principle would be adhered to during construction and operation of the Project. The economic value of the affected environmental resources affected by the Project have been considered throughout the route selection process, the concept design development and the environmental assessment phase.

vii. To encourage the provision and maintenance of affordable housing.

The Project would not have any impact on the provision or maintenance of affordable housing.

viii. To promote the sharing of the responsibility for environmental planning between the different levels of government in the State.

The Project is to be assessed under Part 3A of the *EP&A Act*. The Director-General of the NSW Department of Planning assesses Part 3A project applications. Input into the Director-General's Requirements, in the form of environmental assessment requirements, is obtained from the relevant NSW Government departments and agencies at the time of the lodgement of the proponent's Project Application.

An assessment has been undertaken to determine whether the Project constitutes a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Singleton Council has been involved in the Project consultation process from the time of the route options phase.

ix. To provide increased opportunity for public involvement and participation in environmental planning and assessment.

ARTC has undertaken consultation activities to inform and receive feedback from the public, affected landowners and government agencies of the progress of the Project. The Environmental Assessment would be placed on public exhibition by the NSW DoP for a minimum of 30 days. In accordance with the requirements of the EP&A Act, stakeholders and the public are invited to make submissions. This process provides opportunity for public involvement and participation in environmental planning and assessment of the Project.

5.3 Consistency with Relevant State Policies

The Director-General's Requirements state that justification of the Project's consistency with the aims and objectives of relevant state policies (*State Plan, State Infrastructure Strategy)* is required.

5.3.1 NSW State Plan

The NSW *State Plan, A New Direction for NSW* contains a set of goals that the NSW government will work towards, and identifies priorities for Government action that would help achieve these goals. The Project would assist in achieving a key vision for NSW identified within the State Plan through strengthening the NSW economy and facilitating a safe and reliable coal transport system. The Project would increase coal carrying capacity along the Project route thereby facilitating the efficient rail transportation of coal to the Port of Newcastle.

The Project seeks to contribute towards the following priorities of the Plan:

- Growing Prosperity Across NSW:
  - Priority P1 Increased Business Investment;
  - Priority P2 Maintain and Invest in Infrastructure; and
  - Priority P6 Increased Business Investment in Rural and Regional Australia.

The Project is consistent with the objectives of the NSW State Plan, in particular its commitment to maintaining and investing in infrastructure across the State including railways and strengthening the NSW economy. Further, the Project would result in an outcome that assists the NSW State Government in achieving its listed priorities as summarised below.

Priority P1 Increased Business Investment

The Plan recognises the importance of supporting large and small business. The Project would result in a significant investment in rail infrastructure to support NSW's growing economy, in particular the coal industry.

Additionally, the construction phase of the Project would create opportunity for local businesses to supply services, labour and goods, which would strengthen the local economy.

Priority P2 Maintain and Invest in Infrastructure

The State Plan recognises that every business and person in NSW relies on State Government infrastructure to be provided at the right place and at the right time. The Project would contribute to the delivery of this commitment.

The export efficiency of the coal industry is currently compromised, mainly due to sections of rail infrastructure that cannot cater for future demand. The current constraint of the Hunter Valley coal carrying system (from mine to ship) is the Port of Newcastle's ability to load the quantity of coal transported by rail onto export vessels. By January 2010, the new coal loader at the Port of Newcastle is due to be commissioned. This would therefore mean that the constraint on the coal carrying system would become the rail network. ARTC is therefore implementing a strategy of line improvements endeavouring to keep the rail system capacity in line with industry demands.

The Project would result in significant investment to rail infrastructure, and would permit an increase to coal carrying efficiency to supplement the operation of the new coal loader at the Port of Newcastle.

Priority P6 Increased Business Investment in Rural and Regional Australia

The State Plan recognises that strong rural and regional economies are critical to achieving the overall prosperity of NSW. The Project would strengthen the coal industry in the Hunter Valley, Narrabri, Ulan and the Gunnedah Basin by permitting increased efficiency in coal carrying capacity.

5.3.2 NSW State Infrastructure Strategy

The NSW State Infrastructure Strategy (the Strategy) covers the State's expenditure on capital assets over the next decade and sets out the strategy to manage public investment growth in line with funding sources. The Strategy recognises that demand for infrastructure would remain at very high levels over the next decade and is driven by population growth, ageing and longevity, technological change, industrial and commercial developments, cost pressure, infrastructure renewal and environmental issues.

The Strategy details specific infrastructure strategies for numerous regions across the state, including the Hunter region. Although the Strategy does not specifically identify the upgrades to the coal carrying network in line with ARTC's strategy of line improvements, it does recognise that the volume of freight requiring transportation would continue to increase. Further, the Strategy identifies the Newcastle Port redevelopment as a key part of the Hunter Infrastructure Strategy. The Project would enable the construction of rail infrastructure to help cater for future coal transportation demands and would deliver a constant and reliable supply of coal to the Port of Newcastle, including the new coal loader due to be commissioned by January 2010.

Accordingly, the Project is consistent with the Strategy, as it assists in managing the delivery of appropriate infrastructure.

5.4 State Environmental Planning Policies

5.4.1 State Environmental Planning Policy (Rural Lands) 2008

The aim of this policy is to facilitate the orderly and economic use and development of rural lands for rural and related purposes. Part 2 of SEPP (Rural Lands) identifies rural planning principles to be considered. The rural planning principles contained within SEPP (Rural Lands) encourage the protection and promotion of opportunities for productive and sustainable economic activities in rural areas.

The Project would result in the loss of some land that is zoned rural. However given that property acquisition would be minimal and primarily involve strip acquisition, the existing economic integrity of current rural land use activities would not be compromised.

5.5 Hunter Regional Environmental Plan (HREP) 1989

The *Hunter Regional Environmental Plan 1989* (HREP) applies to the Hunter Region, including the Singleton Local Government Area (LGA). The HREP was gazetted in March 1989 to provide a policy framework for development in the Hunter Region over the ensuing twenty years. The HREP includes a number of objectives to guide both local plan preparation and development control.

The Project is consistent with the objectives of the HREP 1989 pursuant to Part 5, Division 1 in that it would encourage the transport of coal by rail. Overall, the Project is consistent with the provisions of the HREP 1989.

5.6 ARTC Project Objectives

The Director-General's Requirements state that the Project's objectives are to be detailed. ARTC has developed a set of core and non-core objectives for the Project, which are outlined below. These objectives have been developed to achieve the coal carrying capacity requirement at Minimbah Bank.

5.6.1 Core Objectives

The core objectives of the Project are to:

- Reduce headway for loaded coal trains to 8 minutes;
- Increase line capacity to 165 million tonnes per annum (mtpa); and
- Have the reduced headway and increased line capacity in place by March 2010.

5.6.2 Non Core Objectives

The Project is required to address the existing and predicted Minimbah Bank track and associated coal carrying capacity requirements.

The non-core objectives of the Project are to:

- Maximise operational benefits beyond the core objectives within the constraints of the operational requirements;

- Minimise impacts to existing operations during construction and maintenance;
- Minimise the quantity of property acquisition and property severance required;
- Minimise capital expenditure;
- Minimise life cycle maintenance costs;
- Minimise signalling and communications complexity; and
- Have regard to the Principles of ESD (as outlined in ARTC's Environmental Impact Assessment Code of Practice).

5.7 Alternatives Considered

5.7.1 The Implications of Doing Nothing

The consequences of not undertaking the Project would result in a decreased capacity of the lines at Minimbah Bank creating severe service disruptions and increased rail wear. As 95% of coal trains in the Hunter Valley negotiate Minimbah Bank, this problem has significant impacts to the current and future line capacity.

The current constraint of the Hunter Valley coal carrying system (from mine to ship) is the Port of Newcastle's ability to load the quantity of coal transported by rail onto export vessels. By January 2010, the new coal loader at Port of Newcastle is due to be commissioned, meaning therefore, the constraint on the coal carrying system would become the rail network, specifically, the delays caused to loaded coal trains by the Minimbah Bank.

5.7.2 Alternatives Considered

The Options Evaluation Report (GHD, 2007) identified nine possible routes for a third track at Minimbah Bank and are detailed in Figure 5-1. These were workshopped with ARTC and the Rail Infrastructure Group (RIG) with three preferred options being agreed. The three preferred options considered were Option 1, Option 6 and Option 7 and are discussed in the Preferred Options Report (GHD, 2007). These options are detailed in Figure 5-2 and subject to further consideration as discussed in the following sections.

The preferred route selection process was divided into two stages as described below:

Stage 1 – Options Evaluation and Identification of Preferred Options

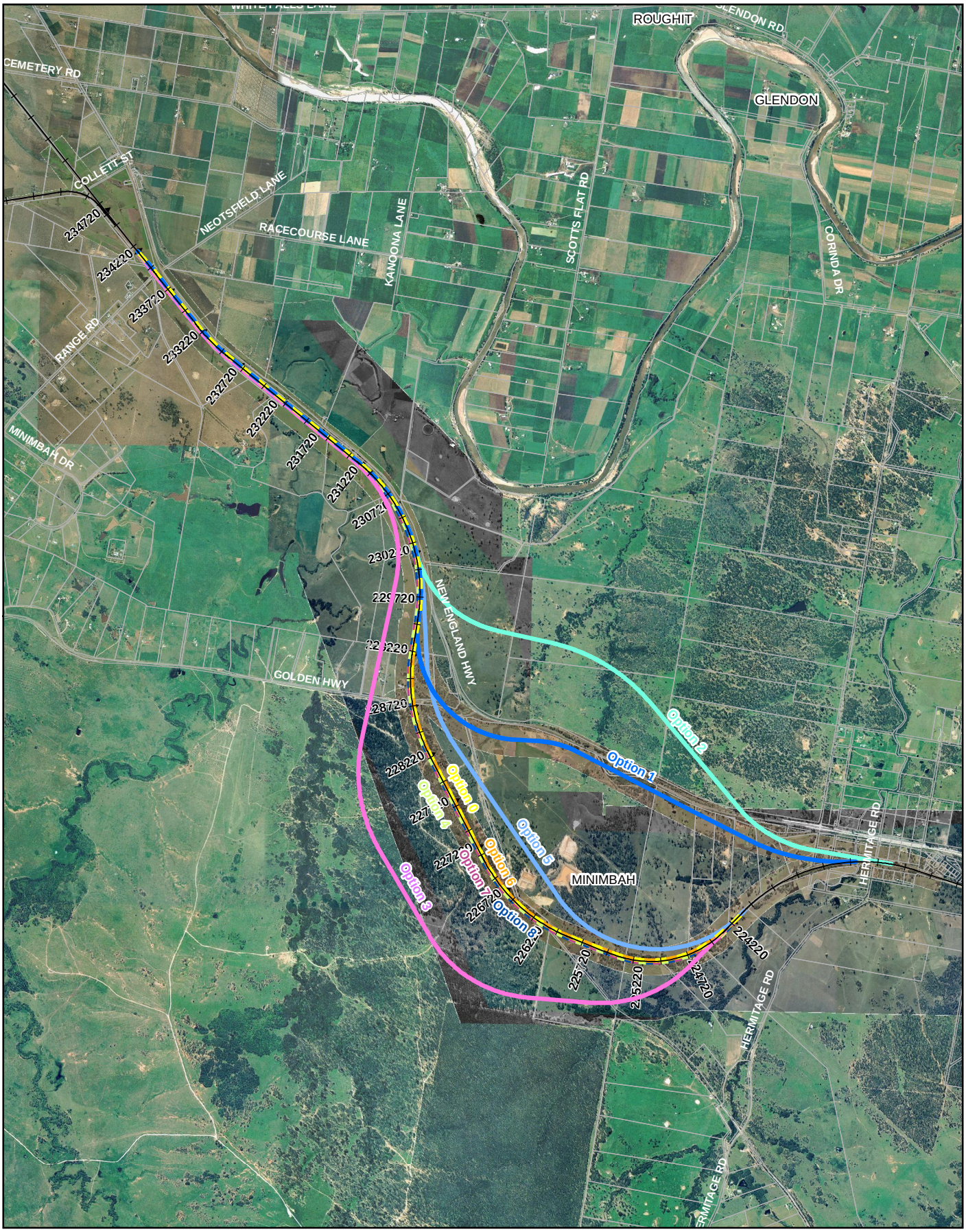
Stage 1 of the process consisted of identification and evaluation of nine possible options. Based on the consideration of cost estimates, consultations with ARTC and project stakeholders, three preferred options were selected to progress to the Stage 2 evaluation.

Stage 2 –Preferred Option Selection

Originally, the primary purpose of Stage 2 was to progress engineering of key elements of the preferred options to enable the refinement of capital cost estimates and the selection of a preferred option. In progressing this original scope, a number of issues arose altering the assessment criteria and therefore the proposed delivery method of the Project. Specifically, these relate to the refinement of previously agreed junction configurations (and associated operational issues) and changes in the completion date of the Project. Consideration of the potential environmental and social issues of the three options was also undertaken and incorporated into the evaluation process. The alteration of the assessment criteria enabled the early selection and recommendation of a preferred option.

The three preferred route options were evaluated against the following criteria:

- Economic evaluation:
  - Order of Magnitude Capital Cost;
  - Net Present Value Analysis; and
  - Internal Rate of Return.
- Operational benefits:
  - Headways;
  - Line capacity; and
  - Additional benefits.
- Property Acquisition:
  - The number of properties impacted; and
  - Minimum area to be acquired.
- Construction constraints;
- Environmental issues;
- Timely delivery; and
- Impact on existing operations.



N

LEGEND

Existing Rail
Option 0
Option 1
Option 2
Option 3
Option 4
Option 5
Option 6
Option 7
Option 8
Cadastre

1:50,000 for A4

0 200 400 800 1,200 1,600

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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ARTC - Minimbah Third Track
Environmental Assessment

Preliminary Route Options

job no. 22-13755
rev no. A

Figure 5.1

25 June 2008

GIS Filename: G:\22\13755\GIS\MAPS\Environment Assess\2213755_EA_FIG5-1_Route_Options_20080624_A3.mxd
GHD 262 King Street Newcastle NSW 2300 Australia T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

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Table 5-1 Route Option Description

Route Option	Key Route Features
0	A third track at existing grade directly adjacent to the Up side of the main line. This option was used as the basis for comparison of other options as it would be the most logical, but not necessarily most efficient, solution.
1	9.87 km of track for Up trains on an alignment running parallel to the New England Highway. A revised grade of 1:100. Would reduce the climb height from 92 metres to 74 metres. Would require substantial property acquisition. Would create land severance and access issues.
2	A third track that runs predominately on the eastern side of the New England Highway, then deviate to a new alignment. Would cross the New England Highway twice with 2 large span bridges required. Would have the highest volume of fill and the second highest volume of cut. Would have a high capital cost.
3	11.11 km of track that runs on a new alignment to the west of the existing Down main line. Would cross the Golden Highway. Would have minimal cut and fill volumes. Would reduce the climb height from 92 metres to 80 metres. Would require a moderate quantity of land acquisition.
4	10.08 km of track running parallel to the Down main line at an adjusted grade of 1:100. Would require minimal land acquisition and minimal cut and fill volumes. Construction works would be in close proximity to live tracks creating a high reliance on track protection and possession times.
5	9.77 km of track that runs between the New England Highway and the Up side of the main line. Would cross the Golden Highway. Would reduce grade to 1:100. Would reduce the climb height from 92 metres down to 80 metres. Would result in moderate cut and fill volumes and would require substantial land acquisition.

Route Option	Key Route Features
6	10.10 km of track for Up trains on an alignment running directly parallel to the existing Up main. Would require minimal land acquisition with minimal cut and fill volumes. Construction works would be in close proximity to live tracks creating a high reliance on track protection and possession times. Would affect the highest number of rail services compared to all other options.
7	10.10 km of track running directly parallel to the existing Down main at the existing grade. Would require minimal land acquisition, minimal cut and fill volumes and minimal services relocations. Construction works would be in close proximity to live tracks creating a high reliance on track protection and possession times. Would not provide any additional operational benefits, as there would be no reduction in grade, and therefore no fuel savings or maintenance advantages.
8	A third track directly adjacent to the Down side of the main line at a revised grade of approximately 1:50. Discounted because it would not provide enough operational functionality and flexibility. An increased grade would prove difficult for Up trains to negotiate.



N

LEGEND

Cadastre | Existing Rail | Option 1 | Option 6 | Option 7

1:50,000 for A4

0 200 400 800 1,200 1,600

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

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ARTC - Minimbah Third Track
Environmental Assessment
Route Options 1, 6 & 7

job no. 22-13755
rev no. A

Figure 5.2

25 June 2008

GIS Filename: G:\22\13755\GIS\MAPS\EnvironmentAssess\2213755_EA_FIG5-2_Route_Opt1-6-7_20080624_A.mxd 352 King Street Newcastle NSW 2300 Australia T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

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5.7.3 Preferred Route

The preferred route was selected based on balancing key criteria and issues common to all. These included operational benefits, capital cost, property acquisition, construction constraints, environmental issues, timely delivery and impact on existing operations. After an extensive route selection process, Option 6 was selected as the preferred alignment. Option 6 is a third track for Up trains on an alignment running parallel to the existing Up main at a revised grade of 1:100.

5.7.4 Conclusions of the Preferred Route Selection Process

The preferred route selection process concluded that:

- A third track at Minimbah Bank is technically and financially feasible;
- The three preferred options meet the key criteria of reducing headways to eight minutes and increasing coal capacity to 165 mtpa;
- Upon completion of a standard Discounted Cash Flow (DCF), all three options indicate a similar return on investment, meaning there is no option that presents itself as an outstanding financial alternative. Therefore, it is likely there would be industry wide benefits regardless of which of the three options was selected;
- In selecting a preferred option criteria other than financial, such as environmental and social, was weighted highly as discussed in Section 5.7.2 and the Preferred Options Report (GHD, 2007); and
- Delivery of all options by 2009, as per the strategy, would be dependent upon variables such as approvals, property acquisition and environmental assessments.