Appendix P
Landscape and Visual Impact

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Document Status

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				Name	Signature	Name	Signature
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Glossary of Terms

Acoustic	Pertaining to the sense of organs of hearing, or to the science of sound.
Background	6km – 16km - Textures are no longer visible, but mountain and valley forms, skylines and ridgelines are important (Forest Practice Board Tasmania, 2006).
Chainage	The chainage at a location along a rail line is the distance of that point in relation to Sydney (NSW only) based on 0.000 kilometres being located at the end of Central No. 1 Platform.
Construction Environmental Management Plan	A document setting out the management, control and monitoring measures to be implemented during construction of a development, to avoid or minimise the potential environmental impacts identified during an environmental impact assessment process.
Cumulative impact	The interaction of impacts arising from a development in conjunction with other past, present and reasonably foreseeable future actions.
Cut	An excavation for constructing below the natural ground level.
Cut batters	The side slopes of cuttings.
Director-General's Requirements	Requirements for an environmental assessment issued by the Director-General of the NSW Department of Planning in accordance with the Environment Planning and Assessment Act 1979.
Fill	Earth used to construct an embankment.
Foreground	0-1 km – Is the visual zone where colour contrast and textural detail are most clearly perceived (Forest Practice Board Tasmania, 2006).
Hunter 8 Alliance	Hunter 8 Alliance, which has been formed to deliver a new third track and ancillary infrastructure between Maitland and Minimbah.
Investigation area	A linear corridor which follows the route of the Main Northern Railway between chainages 194.500 km and 224.200 km.
LVIA	Landscape and Visual Impact Assessment.
Landscape feature	A component, part or feature of the landscape that is prominent or eye-catching, e.g. hills, buildings, vegetation.
Landscape quality	Largely subjective judgement based on particular characteristics that influence the way in which the environment is experienced, including special interests such as cultural associations or heritage interests, the presence and/or type of elements and condition.
Landscape sensitivity	The extent to which landscape can accept a change of a particular type and scale without unacceptable adverse impacts on its character.
Landscape value	Areas of formally designated landscape that through national or local consensus, reflect the value placed by society on particular environments and/or their features.
Level crossing	A crossing provided at grade across the railway corridor.

Middleground	1km-6km – Different elements in the landscape are visually apparent (Forest Practice Board Tasmania, 2006).
Mitigation	Measures, including any process, activity or design to avoid, reduce, remedy or compensate for adverse landscape and visual impacts of a development project.
Option	A concept design alternative developed for consideration.
Overbridge	Where a road or pedestrian footway is situated over the railway line.
Plant	Construction machinery, vehicles or equipment needed to carry out mechanical or construction activities.
Project	'The Project' refers the proposed Hunter 8 Alliance – Stage 2 third track and associated works.
Proponent	Australian Rail Track Corporation (ARTC).
Rail corridor	The area of land dedicated to the ARTC between Maitland and Minimbah.
Residual impact	An impact that occurs/persists after mitigation measures have been put in place.
Sensitive visual receptor	Person and/or viewer group that would experience an impact.
Site compound	Area enclosing construction machinery, stockpiles and site offices usually adjacent to construction sites.
Underbridge	Where a road or pedestrian underpass is situated under the railway line.
Viewing locations	Viewing locations are used in this report to typify the views experienced by sensitive visual receptors throughout the visual catchment of the project. Viewing locations in this report often represent a viewing area, rather than one exact point. These areas are defined in 4.4.
Visual amenity	The value of a particular area or view in terms of what is seen.
Visual impact	Changes in the appearance of the landscape or in the composition of available views as a result of development, to people's responses to these changes, and to the overall impacts in regard to visual amenity. This can be positive (i.e. beneficial or an improvement) or negative (i.e. adverse or a detraction).
Visual catchment	Extent of potential visibility to or from a specific area, feature or proposal.

Executive Summary

The Project consists of the construction of a third track adjacent to the existing two tracks of the Main Northern Railway between Farley and Minimbah. Along this alignment, the works required to construct the third track and associated infrastructure would impact on the visual environment, the extent of which being determined by the nature and location of the works being undertaken and the locations from which views are available.

The objective of this Landscape and Visual Impact Assessment is to assess the potential impact of construction and operation of the Project on landscape character and visual amenity. Landscape and visual values and impacts of the project are assessed separately, although they are closely interrelated. The assessment of the potential landscape impacts of a project is carried out as an impact on an environmental resource (i.e. the landscape) whereas visual impacts are assessed as one of the interrelated impacts of a project on the viewing population.

The majority of landscape and visual impacts as assessed in this report would be a result of activities carried out in the construction phase of the Project. These activities include the clearance of vegetation which currently adds to the landscape character of an area, the presence of construction machinery and activities in an otherwise rural landscape and the construction of earthworks batters which, until vegetated, would be a visually obvious element in the landscape.

Some impacts would occur in the operations phase of the Project. In some locations, vegetation clearance during the construction phase would result in views of coal and commuter trains being made available to residences that currently do not have views to such elements. In other locations, earthworks batters will be located closer to residences than they currently are.

Mitigation measures recommended to minimise these issues include avoiding loss of damage to vegetation wherever possible, the minimisation of light spillage during construction and the early involvement of landscape architects to ensure an optimal landscape strategy can be developed.

The landscape and visual impacts of the project are assessed as being of moderate significance. Due to the nature of the project there would be a permanent impact on the visual landscape and amenity of some locations along the Project alignment.

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1. Introduction

This Landscape and Visual Impact Assessment has been undertaken by the Hunter 8 Alliance on behalf of the Australian Rail Track Corporation (ARTC) for the Maitland to Minimbah Third Track Project (referred to as 'the Project'). This report has been prepared to assess the significance of impacts on the visual landscape and outlook as a result of the Project and identify the extent to which mitigation of impacts is required.

1.1 Background

ARTC was created by the Commonwealth and State Governments in 1998 to provide a single body responsible for the National Interstate Rail Network. ARTC is a Commonwealth Government corporation and currently has responsibility for the management of over 10,000 route kilometres of standard gauge interstate rail track in South Australia, Victoria, Western Australia and New South Wales (NSW), as well as the Hunter Valley Rail Network and other regional rail links in NSW.

The Hunter Valley Rail Network extends from the Port of Newcastle to Ulan and Narrabri in the west. It is used by passenger services, freight, wheat and coal services. The majority of trains carry coal from mines located across the Hunter Valley to either Carrington (Port Waratah) or Kooragang Island ports at Newcastle for loading onto ships for export.

Due to the forecast increase in coal throughput at the Port of Newcastle to 190 million tonnes per annum (mtpa) by 2012, a number of rail infrastructure improvements to the Hunter Valley Rail Network have been proposed by ARTC. One of the key improvement projects included in the ARTC ten-year strategic plan is a proposed third track adjacent to the existing Main Northern Railway between Maitland and Whittingham, known as the Maitland to Whittingham Third Track Project.

The Maitland to Whittingham Third Track Project is divided into two stages. Stage 1 consists of the construction of the third track between Minimbah and Whittingham. Project Approval for this project was granted by the Minister of Planning on 26 May 2009 and construction commenced in July 2009.

Stage 2 consists of the construction of the third track between Maitland and Minimbah, known as the Maitland to Minimbah Third Track Project. Stage 2 is the subject of this Landscape and Visual Impact Assessment and is referred to as 'the Project'.

The purpose of the Project is to increase rail reliability and future capacity between the Hunter Valley and the Port of Newcastle. In addition to providing increased track capacity, the Project aims to improve operational performance along the route. These improved efficiencies would be created through:

- Reduced impacts on coal traffic due to track maintenance activities.
- Reduced loss of freight train paths due to shadow effects from passenger services.
- Reduced loss of available train paths due to train breakdowns.

The Project would also bring benefits to the local and broader community by generating up to 650 full time jobs during construction, creating opportunities for local and regional goods and service providers, and providing greater security for existing coal industry jobs.

1.2 Description of the Project

The Hunter 8 Alliance, on behalf of the ARTC, is proposing to construct a third track adjacent to the existing Main Northern Railway between Maitland and Minimbah. The proposed third track would commence in Farley approximately 2 kilometres west of Maitland Station at approximate chainage 194.500 kilometres and would run adjacent to the Main Northern Railway for approximately 30 kilometres concluding at Minimbah at approximate chainage 224.200 kilometres.

The proposed third track would be predominantly located on the Up side of the Main Northern Railway. Approximately 3 kilometres of track, from chainages 210.170 kilometres to 211.180 kilometres and 214.060 kilometres to 216.000 kilometres, would be located on the Down side.

The Project would involve the construction of approximately 30 kilometres of new rail track as well as construction and/ or modification of major infrastructure along the Main Northern Railway. A summary of the major elements of the Project is provided in Table 1-1.

Table 1-1 Major Project Elements

Project Elements	
Earthworks	Major cut and fill earthworks along the route. Other minor earthworks.
Track	Approximately 30 km of new track including turnouts and junctions. Relocation of turnouts from Minimbah and Branxton to Belford. Upgrade of maintenance siding turnouts at Branxton. Track reconditioning of existing Up Main at Greta and Branxton Stations and of the Branxton crossovers.
Drainage	Central and cess track drainage. Amendments to 53 culverts for cross drainage. Re-alignment of Sawyers Creek. Other drainage works around new structures.
Bridges	A new rail underbridge at Stony Creek and Wollombi Road, Farley. Closure of the stock crossing at Farley. Demolition of the existing rail overbridge at Old North Road, Allandale. A new rail underbridge at Allandale Road, Allandale. A new rail underbridge for an unnamed tributary of Anvil Creek (chainage 207.776 km).

Project Elements	
	Demolition and replacement of the existing rail underbridge at an unnamed tributary of Anvil Creek, Greta (chainage 209.989 km). A new rail underbridge at Sawyers Creek, Greta. Modification of the existing rail overbridge at Bridge Street, Branxton. A new rail underbridge at Black Creek, Belford. A new rail underbridge at Jump Up Creek, Belford.
Station Modifications	Modifications to Lochinvar Railway Station. Modifications to Greta Railway Station. Modifications to Branxton Railway Station.

1.3 Investigation Area

The investigation area for this Landscape and Visual Impact Assessment is a linear corridor which follows the route of the Main Northern Railway between chainages 194.500 kilometres and 224.220 kilometres and is shown in Figure 1-1.

The investigation area captures the footprint of disturbance for the third track and other associated works, including construction compounds, haul roads and spoil disposal areas.

1.4 Objectives and Purpose of this Report

The objectives of this Landscape and Visual Impact Assessment are to:

- Assess the potential impact of construction and operation of the Project on landscape character and visual amenity.
- Assess the significance of these potential impacts on sensitive receptors and the wider community as a whole. The significance of impacts will be assessed as a function of the magnitude of the impact on the landscape and the sensitivity of the viewer, as described in 2.4.3.
- Propose mitigation measures that will help to ameliorate these impacts during both the construction and operation stages of the Project.

Whilst there were no Director-General's Requirements issued for the Project regarding Landscape and Visual values, this report will provide an assessment addressing all relevant legislation.

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0 95 190 380 570 760

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Existing Railway
- Watercourse
- Cadastre
- Construction Impact Zone
- Investigation Area
- Watercourse Area
- National Park

Maitland to Minimbah Third Track
Landscape and Visual Impact Assessment

Job Number 22-14471
Revision A
Date MAY 2010

Investigation Area

Figure 1.1a

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Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

Data Source: Geoscience Australia: Topography - 2002; Department of Lands: Aerial - 2005; Fugro: Aerial - 2008; Department of Lands: Cadastre - 2004. Created by: fmackay, tmorton

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0 95 190 380 570 760

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

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LEGEND

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Maitland to Minimbah Third Track
Landscape and Visual Impact Assessment

Job Number 22-14471
Revision A
Date MAY 2010

Investigation Area

Figure 1.1b

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Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

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Maitland to Minimbah Third Track
Landscape and Visual Impact Assessment

Job Number 22-14471
Revision A
Date MAY 2010

Investigation Area

Figure 1.1c

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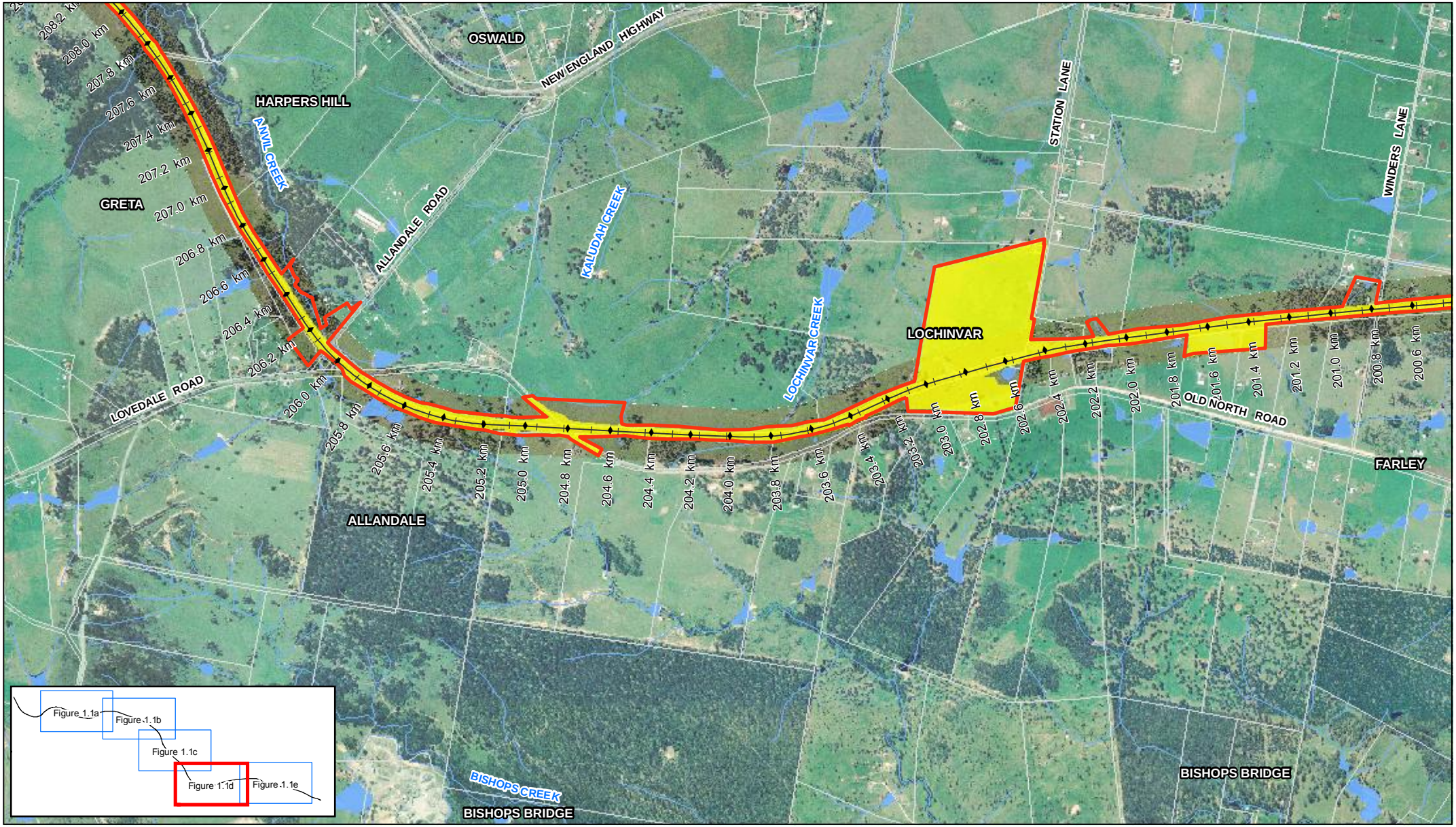
Data Source: Geoscience Australia: Topography - 2002; Department of Lands: Aerial - 2005; Fugro: Aerial - 2008; Department of Lands: Cadastre - 2004. Created by: fmackay, tmorton



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Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

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Maitland to Minimbah Third Track
Landscape and Visual Impact Assessment

Job Number 22-14471
Revision A
Date MAY 2010

Investigation Area

Figure 1.1d

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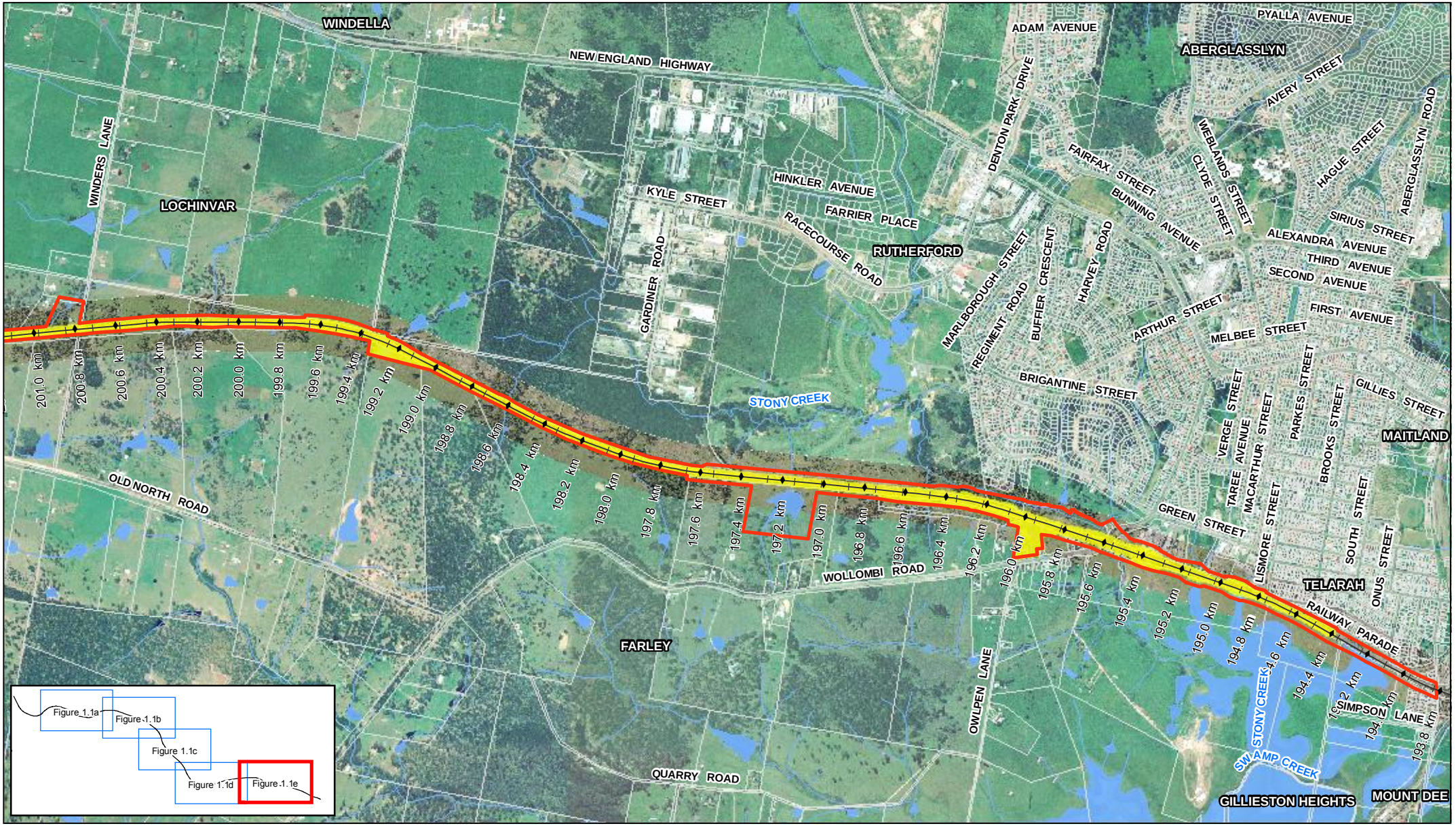

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0 95 190 380 570 760

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

- Existing Railway
- Watercourse
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- National Park

Maitland to Minimbah Third Track
Landscape and Visual Impact Assessment

Job Number 22-14471
Revision A
Date MAY 2010

Investigation Area

Figure 1.1e

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Data Source: Geoscience Australia: Topography - 2002; Department of Lands: Aerial - 2005; Fugro: Aerial - 2008; Department of Lands: Cadastre - 2004. Created by: fmackay, tmorton

2. Methodology

2.1 Introduction

Components of the methodology for this study, including impacts and proposed mitigation measures, have been derived from the *Guidelines for Landscape and Visual Impact Assessment, Second Edition*, published by the Landscape Institute and Institute of Environmental Management and Assessment (2002), *Visual Landscape Planning in Western Australia* document produced by the Western Australian Planning Commission (2007), and the Forest Practice Board of Tasmania's, *A Manual for Forest Landscape Management (2006)*.

2.2 Visual Impact Assessment Scope

This visual impact assessment addresses the potential landscape and visual impacts associated with the project, including:

- Review of existing information relevant to the visual environment, including existing landform, vegetation, and land use.
- A description of the Project and its visual components.
- An evaluation of the existing landscape and visual environment.
- Discussion of visual receptor sensitivity within the study area through the use of viewing locations.
- Assessment of the significance of impacts on visual landscape character and amenity at the viewing locations as a direct result of the Project.
- Proposed mitigation strategies.

2.3 Existing Environmental Values

The methodology for the identification of the existing environmental values of the area surrounding the site and the identification of the viewing locations is detailed below:

- Identification of the visual catchment, which is the area from which views of the Project and its associated works are potentially visible.
- Description of the landscape character of the visual catchment including the aspects of landform, land use, and vegetation.
- Identification of viewing locations from which elements of the project would be visible and within the landscape character units and describing the visual outlook from these locations.
- Site verification with photographic recording to provide a representation of typical views and outlooks from the viewing locations.

2.4 Assessment of Impacts

A qualitative assessment of landscape and visual impacts forms the second component of the assessment. The significance of impacts has been evaluated using a combination of landscape impacts and visual impacts, as defined below.

2.4.1 Landscape Impact

Landscape impacts refer to the relative capacity of the landscape to accommodate changes to the physical landscape of the type and scale proposed that would occur as a direct result of the Project. Impacts have been assessed for the viewing locations and sensitive visual receptors in 5.2.3, in terms of the scale of visual change including:

- The extent to which the change of features alters the existing landscape character.
- The extent of area from which the effect is evident.
- The duration of the effect (short, medium, long term, or permanent).
- The physical state (or condition) of the landscape and its intactness from visual, functional, and ecological perspective. This includes consideration of the condition of landscape elements such as roadside planting or landscaping or features such as a distinctive building, or significant mature trees, and their contribution to landscape character.
- The effectiveness of any proposed mitigation.

Definitions used to describe this assessment are detailed in Table 2-1.

Table 2-1 Assessment of Landscape Impact

Landscape Impact	Definition
Large	A substantial / obvious change to the landscape due to total loss of, or change to, elements, features or characteristics of the landscape. Would cause a landscape to be permanently changed and its quality diminished. Change is likely to cause a direct adverse permanent or long term (more than 10 years) impact on the value of the receptor.
Moderate	Discernible changes in the landscape due to partial loss of, or change to the elements, features or characteristics of the landscape. May be partly mitigated. The change would be out of scale with the landscape, and at odds with the local pattern and landform and will leave an adverse impact on the landscape. Change is likely to impact adversely the integrity/value of the receptor but recovery is predicted in the medium term (5-10 years).
Small	Minor loss or alteration to one or more key landscape elements, features, or characteristics, or the introduction of elements that may be visible but may not be uncharacteristic within the existing landscape. Change is likely to adversely impact the integrity/value of the receptor but recovery is expected in the short term (0-4 years).
Negligible	Almost imperceptible or no change in the view as there is little or no loss of / or change to the elements, features or characteristics of the landscape. The existing landscape quality is maintained but may be slightly at odds to the scale, landform and pattern of the landscape.

(Landscape Institute and Institute for Environmental Management and Assessment, 2002)

2.4.2 Visual Impact

Visual impacts arise from changes in available views of the landscape that occur as a result of the Project. Visual impact is determined through the subjective assessment of sensitivity of the visual receptors and the magnitude (scale) of the change in view. The sensitivity of a receptor to these impacts is dependent upon their location; the importance of their view; their activity; expectations; available view; and the extent of screening of this view.

Factors that have been considered in assessing the response to changes in the visual amenity include:

- Interest in the visual environment and their distance/angle of view to the source of the impact.
- The extent of screening/filtering of the view.
- Magnitude of change in the view (i.e. loss/addition of features that change the view's composition).
- Integration of changes within the existing view (form, mass, height, colour and texture).
- Duration of the effect (temporary/permanent, intermittent/continuous).
- Effectiveness of the proposed mitigation.

Receptor sensitivity definitions used to describe this assessment have been outlined in Table 2-2 below.

Table 2-2 Assessment of Receptor Sensitivity

Sensitivity	Definition
High	◗ Occupiers of residential properties with long viewing periods, within close proximity to the proposed development. ◗ Communities that place value upon the landscape and enjoyment of views of their landscape setting.
Medium	◗ Outdoor workers who have a key focus on their work who may also have intermittent views of the project area. ◗ Viewers at schools, or similar, when outdoor play and recreation areas are located within close proximity but viewing periods are limited. ◗ Occupiers of residential properties with long viewing periods, at a distance from or screened from the project area.
Low	◗ Road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the study area and therefore have short term views. ◗ Viewers indoor at their place of work, schools or similar.

Sensitivity	Definition
Negligible	◗ Viewers from locations where there is screening by vegetation or structures where only occasional screened views are available and viewing times are short. ◗ Road users in motor vehicles, trains or on transport routes that are passing through/adjacent to the study area and have partially screened views and short viewing times.

(Landscape Institute and Institute for Environmental Management and Assessment, 2002)

2.4.3 Significance of Impact

For the purposes of this assessment, predicted impacts as a direct result of the project have been described according to their significance, which is a function of the magnitude of the impact and the sensitivity of the receptor as detailed in Table 2-3 below. Only impacts that are considered to be of major or high significance are considered as significant for the purposes of this assessment.

Table 2-3 Significance of Impact

Landscape Impact					
		Large	**Moderate**	**Small**	**Negligible**
Visual Sensitivity	**High**	Major Significance	High Significance	Moderate Significance	Minor Significance
	Medium	High Significance	Moderate Significance	Minor Significance	Not Significant
	Low	Moderate Significance	Minor Significance	Not Significant	Not Significant
	Negligible	Minor Significance	Not Significant	Not Significant	Not Significant

(Landscape Institute and Institute for Environmental Management and Assessment, 2002)

2.4.4 Limitations of the Landscape and Visual Impact Assessment

The Landscape and Visual Impact Assessment (LVIA) process aims to be objective and describe any changes factually, however, the significance of these changes requires qualitative (subjective) judgements to be made. The conclusions of this assessment therefore combine objective measurement and subjective professional interpretation.

3. Legislation

The Project is proposed to be constructed through the Local Government Areas of Maitland, Cessnock and Singleton. The Local Environmental Plans (LEPs) for these regions make a number of references to the preservation of Landscape and Visual values within their boundaries, with reference to the planning zones within which the Project is proposed.

3.1 Singleton Local Environmental Plan, 1996

Within the Singleton Local Government Area, the Project is proposed to be constructed through, or adjacent to, the following planning zones:

- Zone 1 (a) Rural Zone.
- Zone 7 (b) Environment Protection Zone.

Applicable references are as follows –

Zone 1 (a) (Rural Zone)

Objectives of zone

" to maintain the scenic amenity and landscape quality of the area"

Vegetation would be cleared within these zones during the construction stage of the Project. This reference will be referred to when assessing the impact of such activities.

Zone 7 (b) (Environment Protection Zone)

Objectives of zone

" to conserve land or items of special environmental significance"

In proximity of the Project, this zoning applies to the Belford National Park. This National Park is across the New England Highway from the works and, while long distance views to the works could be available from this zone during the construction phase, the land itself will not be adversely impacted upon.

3.2 Cessnock Local Environmental Plan, 1989

Within the Cessnock Local Government Area, the Project is proposed to be constructed through, or adjacent to, the following planning zones:

- 1a - Rural 'A' Zone.
- 1c - Rural Residential/Rural (Small Holdings) Zone.
- 2a - Residential 'A' Zone.
- 4b - Light Industrial Zone

- 5b - Special Uses (Railways) Zone.
- 7b - Environmental Protection (Conservation) Zone.

Applicable references are as follows:

Part 3 Special provisions - 10 - General development principles - rural and environmental protection zones and Hunter Employment Zone

"where land is proposed to be cleared, vegetation should be retained in appropriate locations to reduce the visual impact of clearing to the maximum extent consistent with the rural character of the area"

Vegetation would be cleared within these zones during the construction stage of the Project. This reference will be referred to when assessing the impact of such activities.

Part 3 Special provisions - 10 - 33 - Temporary uses

"The Council may grant consent to the temporary development of any land, including development for the purposes of temporary accommodation, construction camps, construction depots, markets, fetes, circuses, public purposes and the like, for such period as may be determined by the Council, where it is satisfied that: the development is unlikely to interfere with the amenity of any residential development or rural dwellings in the vicinity"

Whilst there are no site compounds, equipment storage or spoil areas proposed for the Cessnock Local Government Area, this reference will be considered when assessing potential impacts of the Project during the construction phase.

3.3 Maitland Local Environmental Plan, 1996

Within the Maitland Local Government Area, the Project is proposed to be constructed through, or adjacent to, the following planning zones:

- 1(b) – Secondary Rural Land.
- 2(a) - Residential.
- 4(b) - Light Industrial
- 5(b) - Special Uses Railways.
- 6(a) - Public Recreation
- 6(b) - Private Recreation
- 7(a) - Environmental Protection Wetlands.

Applicable references are as follows -

Page 14 - Part 2 Rural Zones - 10 - What rural zones apply in this plan?

"Objectives of the zone: To control development that could: have an adverse impact on rural character."

This reference will be considered when assessing the impact of Project activities where construction works for the Project would occur within or adjacent to Secondary Rural Land.

Page 23 - Part 6 Special Use Zones - 10 - What special use zones apply in this plan?

"Objectives of the zone: To recognise existing railway land and to enable future development for railway and associated purposes."

This reference supports the use of land zoned as Special Uses Railways for the development of railway infrastructure, such as the construction of a third track, as proposed in this Project.

4. Existing Visual Environment

The following section provides an overview of the existing landform, land uses and vegetation in the vicinity of the project site. These features all contribute to the existing landscape and visual character of the area. Views from locations within the Project area are made up of foreground, middleground and background elements that together make up the view.

4.1 Landform

The landform in the vicinity of the Project alignment is generally flat to gently undulating. The elevation of the Project alignment ranges from approximately 10m AHD near Rutherford in the east (approximate chainage 194.500 km), to approximately 93m AHD at Harper's Hill, south east of Greta (approximate chainage 205.360 km),. Ridges and mountains to the north, beyond the Hunter River, form the background horizon of some views, while ridges and mountains to the south (Heaton State Forest and Watagans National Park) and south-west (Pokolbin State Forest) from the background in other views.

4.2 Land Use

The Project is located in the Hunter Valley, with the Main Northern Railway loosely following the route of the New England Highway, separated in some locations by up to 2km. Running through or near the towns of Rutherford, Lochinvar, Allandale, Greta, Branxton and Belford within the project area, the Main Northern Railway line is used by coal freight trains, general freight trains and commuter trains. A large portion of the area through which the Project runs is agricultural land, primarily used for grazing purposes. In some locations, the railway line runs through or near residential areas. This primarily occurs around the towns of Rutherford, Greta, Branxton and Belford. The railway line is located near a number of rural-residential properties, located along the length of the Project. The railway line is also located near several industrial / light industrial properties, primarily around the towns of Rutherford and Branxton.

4.3 Landscaping and Vegetation

Much of the Project route is dominated by a rural cleared landscape that is typified by cleared grazing pasture and some scattered trees and low vegetation. These areas show much evidence of modification, both through the previous clearing of vegetation, primarily for grazing, and the introduction of pasture grasses. At other locations along the project route, the landscape is more heavily vegetated, with patches of indigenous bushland and scattered groups of trees. These more heavily vegetated areas occur around Farley, Rutherford (west of the Rutherford industrial area), along Anvil Creek between Allandale and Greta, south of the railway line near Branxton and around Belford, in close proximity to the Belford National Park.

4.4 Viewing Locations

The viewing locations are areas where full or screened views of the rail corridor are possible and there is human activity being undertaken. This activity may include residential, business, schooling or recreation. In addition, viewing locations also include areas where the only views are transient such as vehicles using a road or views from trains.

The following viewing locations are locations from which components of the project have some visibility for either short or long durations. It is recognised that there are areas from which components of the project can potentially be seen that have not been included as viewing locations. These viewing locations have been selected to represent the range of views available from the broad variety of receptors along the rail corridor.

The Viewing Locations for which the visual impact of the project has been assessed are:

- 1 - Wollombi Road, Farley (Figure 4.1).
- 2 - Station Lane, Lochinvar (Figure 4.2).
- 3 - Old North Road, Allandale (Figure 4.2).
- 4 - Clift Street, Greta (Figure 4.3).
- 5 - Mansfield Street, Greta (Figure 4.3).
- 6 - Branxton Residential and Rail Overpass (Figure 4.4).
- 7 - Branxton Railway Station (Figure 4.4).
- 8 - Belford Street, Belford (Figure 4.5).
- 9 - Kirkton Street, Belford (Figure 4.5).

The location of the viewing locations are shown on Figures 4.1 - 4.5 and are addressed in the following sections.

1:25,000 (at A4)

0 125 250 500 750 1,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

Project Location

1 Viewing Location (See section 4.4 for descriptions)

Maitland to Minimbah Third Track
Landscape and Visual Assessment Report

Job Number 22-14471
Revision A
Date MAY 2010

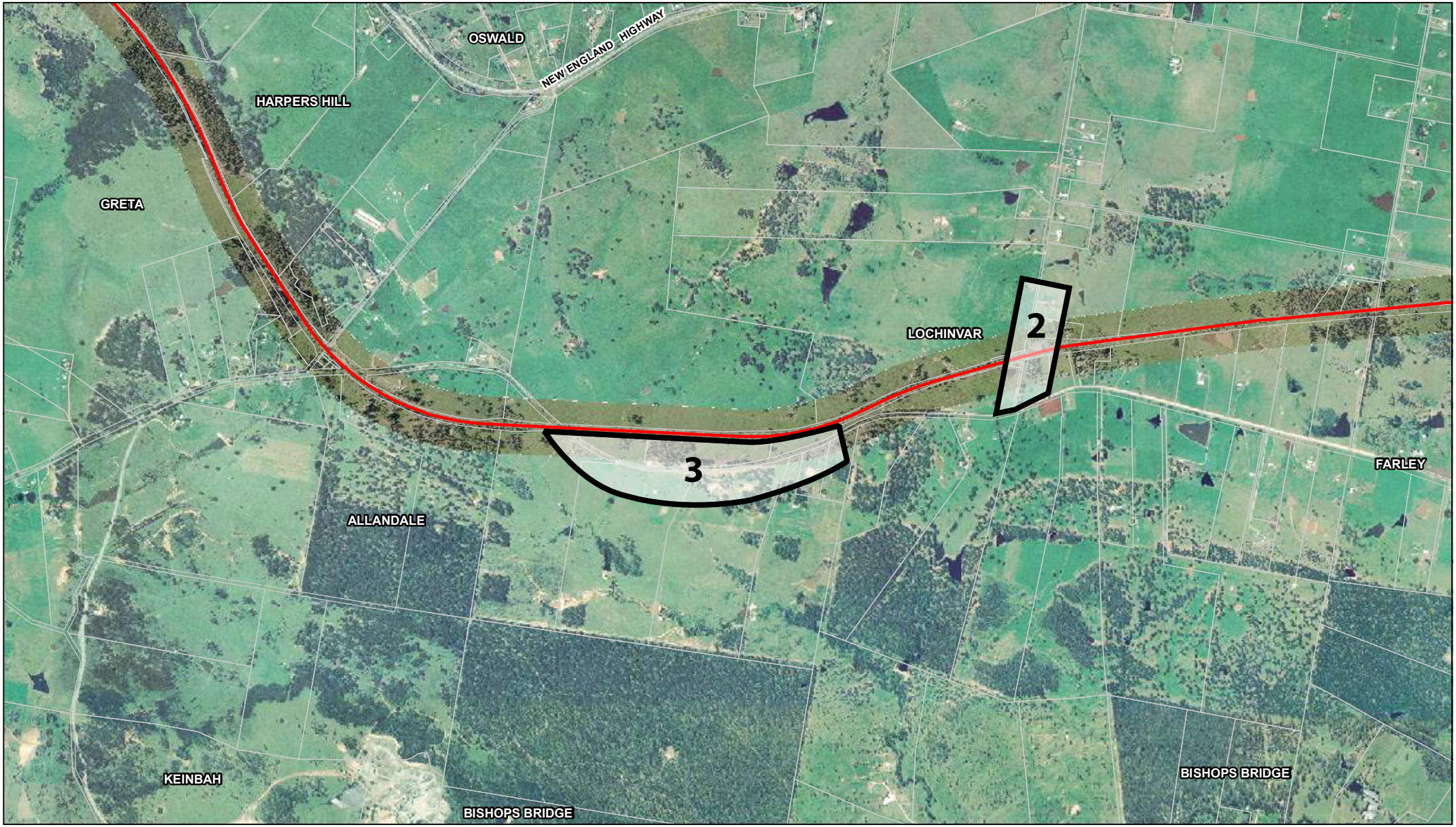
Viewing Locations

Figure 4.1

G:\22\14471\GIS\Maps\Deliverables\EA\Visual Assessment Report\VisualAssessment_20091006_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: Geoscience Australia: Topography - 2002; Department of Lands: Aerial & Cadastre - 2005; Fugro: Aerial - 2008; Department of Lands: LHCCREMS Vegetation - 2005. Created by: fmackay, gmcdiarmid



1:25,000 (at A4)

0 125 250 500 750 1,000

Metres

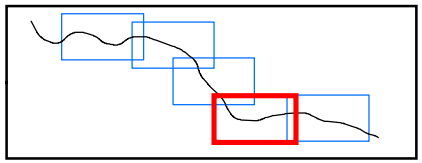
Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

Project Location

1 Viewing Location (See section 4.4 for descriptions)



Maitland to Minimbah Third Track
Landscape and Visual Assessment Report

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Revision A
Date MAY 2010

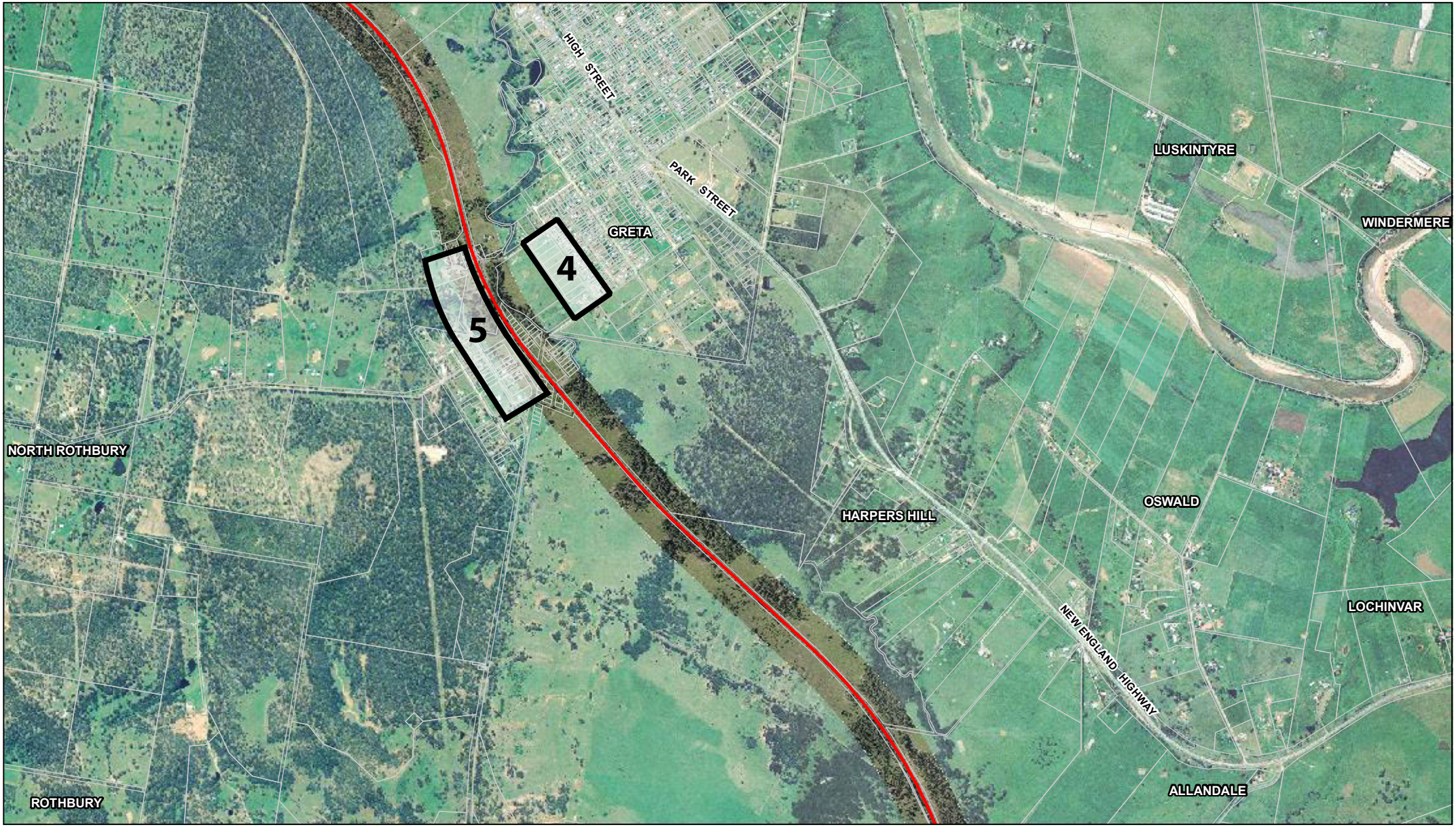
Viewing Locations

Figure 4.2

G:\22\14471\GIS\Maps\Deliverables\EA\Visual Assessment Report\VisualAssessment_20091006_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

Data Source: Geoscience Australia: Topography - 2002; Department of Lands: Aerial & Cadastre - 2005; Fugro: Aerial - 2008; Department of Lands: LHCCREMS Vegetation - 2005. Created by: fmackay, gmcdiarmid



1:25,000 (at A4)

0 125 250 500 750 1,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

Project Location

1 Viewing Location (See section 4.4 for descriptions)

Maitland to Minimbah Third Track
Landscape and Visual Assessment Report

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Revision A
Date MAY 2010

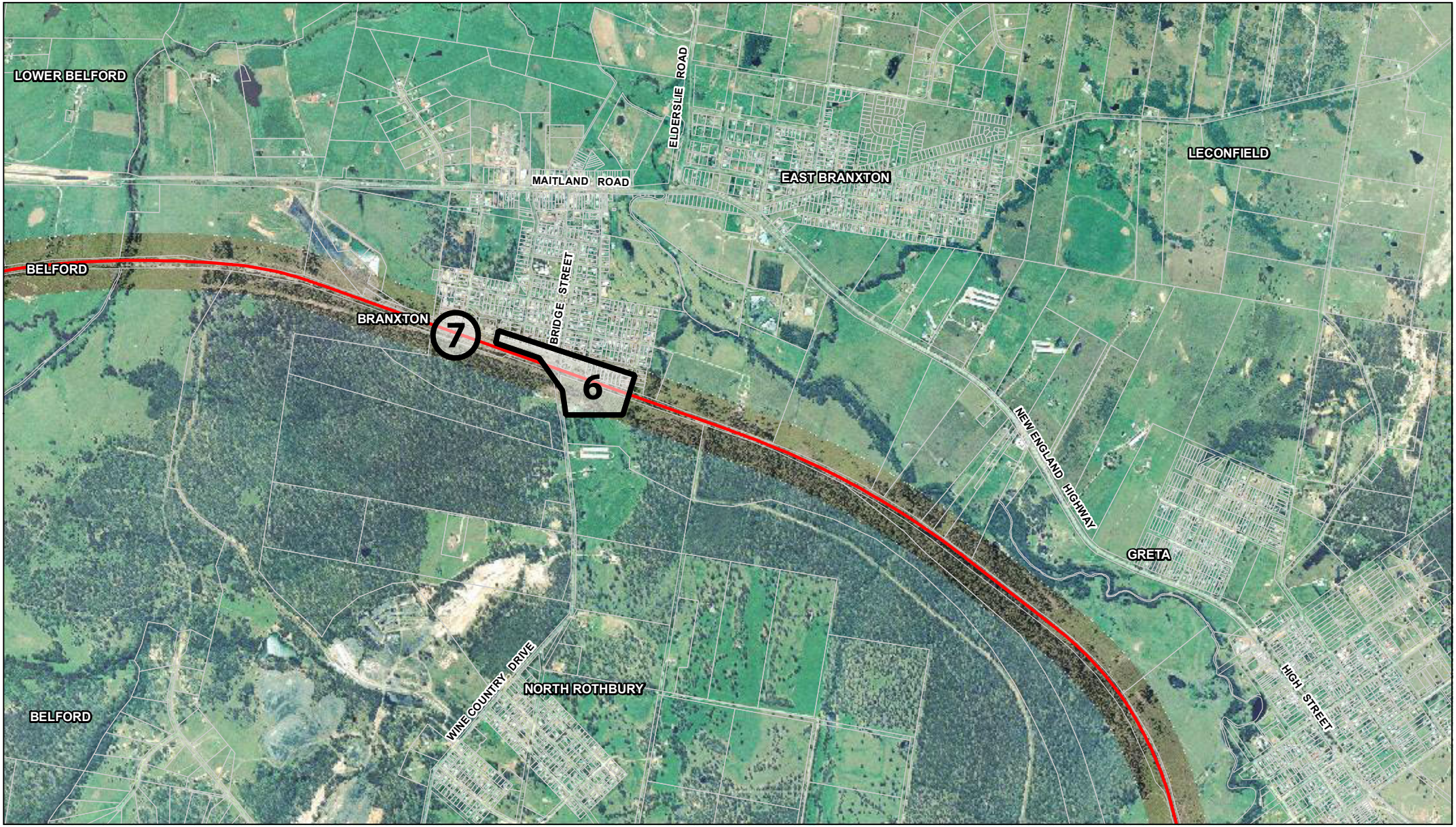
Viewing Locations

Figure 4.3

G:\22\14471\GIS\Maps\Deliverables\EA\Visual Assessment Report\VisualAssessment_20091006_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

Data Source: Geoscience Australia: Topography - 2002; Department of Lands: Aerial & Cadastre - 2005; Fugro: Aerial - 2008; Department of Lands: LHCCREMS Vegetation - 2005. Created by: fmackay, gmcdiarmid



1:25,000 (at A4)

0 125 250 500 750 1,000

Metres

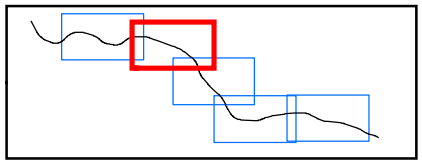
Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

Project Location

1 Viewing Location (See section 4.4 for descriptions)



Maitland to Minimbah Third Track
Landscape and Visual Assessment Report

Job Number 22-14471
Revision A
Date MAY 2010

Viewing Locations

Figure 4.4

G:\22\14471\GIS\Maps\Deliverables\EA\Visual Assessment Report\VisualAssessment_20091006_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 T 61 2 4979 9999 F 61 2 4979 9988 E ntlmail@ghd.com.au W www.ghd.com.au

Data Source: Geoscience Australia: Topography - 2002; Department of Lands: Aerial & Cadastre - 2005; Fugro: Aerial - 2008; Department of Lands: LHCCREMS Vegetation - 2005. Created by: fmackay, gmcdiarmid

1:25,000 (at A4)

0 125 250 500 750 1,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Australian Geodetic Datum 1966
Grid: Integrated Survey Grid, Zone 56-1

N

LEGEND

Project Location

1 Viewing Location (See section 4.4 for descriptions)

Maitland to Minimbah Third Track
Landscape and Visual Assessment Report

Job Number 22-14471
Revision A
Date MAY 2010

Viewing Locations

Figure 4.5

G:\22\14471\GIS\Maps\Deliverables\EA\Visual Assessment Report\VisualAssessment_20091006_A.mxd

Level 3, GHD Tower, 24 Honeysuckle Drive, Newcastle NSW 2300 **T** 61 2 4979 9999 **F** 61 2 4979 9988 **E** ntlmail@ghd.com.au **W** www.ghd.com.au

Data Source: Geoscience Australia: Topography - 2002; Department of Lands: Aerial & Cadastre - 2005; Fugro: Aerial - 2008; Department of Lands: LHCCREMS Vegetation - 2005. Created by: fmackay, gmcdiarmid

4.4.1 Viewing Location 1 – Wollombi Road, Farley

Wollombi Road is one of the major access roads into Rutherford from the south west. This viewing location provides elevated views over the railway corridor and beyond, to the town of Rutherford. The existing visual context of this viewing location is described in Table 4-1.

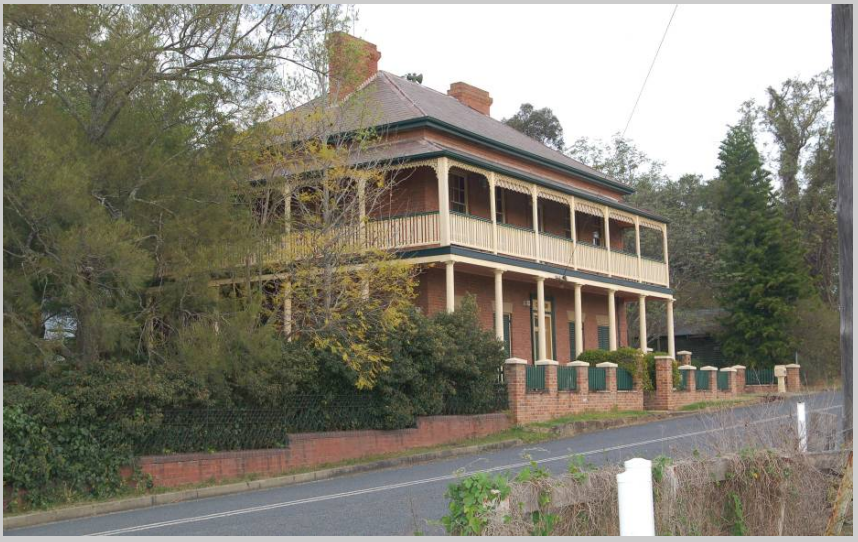
Table 4-1 Wollombi Road Existing Visual Context

Typical Local Landscape Character	 Photo 1 - View to the north from Wollombi Road. Railway line can be seen at edge of vegetated area (approx distance 500m) with the town of Rutherford visible beyond.
Landform	This viewing location is located on an elevated ridge line, with views available to both the north and south. Flat to gently undulating land surrounds the area, with hills visible approx 7-8 km to the north.
Vegetation	The vegetation of this viewing location is characterised by open pasture and grasslands, with scattered trees. An area of dense indigenous vegetation is visible in the distance, extending towards the town of Rutherford.
Land Use	The area around Wollombi Road is primarily used for agricultural grazing and rural residential type development.
Visual Context	Views of the Main Northern Railway Line, including the movement of coal and commuter trains, are available from this elevated viewing location. These views however are partially screened by vegetation. The railway line is seen against a backdrop of dense vegetation and, beyond that, the town of Rutherford. This location typifies views experienced by: Residents of Wollombi Road. Travellers along Wollombi Road.

4.4.2 Viewing Location 2 – Station Lane, Lochinvar

Station Lane runs from the town of Lochinvar, located 2.5km north of the railway line, to Old North Road. A level crossing and railway station are located where Station Lane crosses the railway line. Several residences are located in this vicinity. The existing visual context of this viewing location is described in Table 4-2.

Table 4-2 Station Lane Existing Visual Context

Typical Local Landscape Character	 Photo 2 - View to the west from 245 Station Lane, Lochinvar. Lochinvar railway station and level crossing can be seen at right of image (approx distance 50m).  Photo 3 - 'Clifton' homestead at 245 Station Lane, Lochinvar. This property overlooks the rail corridor and Lochinvar Railway Station
Landform	This landform in the vicinity of Station Lane is flat to gently undulating landscape, rising gently towards a ridgeline to the south (Old North Road).
Vegetation	The vegetation of this viewing location is characterised by open pasture and grasslands, with scattered trees. The historically significant 'Clifton Homestead' property contains a mix of mature and dense vegetation, uncharacteristic of the surrounding landscape.

Land Use	The area around Station Lane is primarily used for agricultural grazing and rural residential type development. The Lochinvar railway station is located approx 50 north of this viewing location. This is a commuter station with two platforms approx 25m in length. There are five houses within approximately 400m of the railway line in this location that have varying views over the rail corridor and railway station. Clifton Homestead, located at 245 Station Lane, Lochinvar (pictured above), was built during the period from (approximately) 1845-1850 and is situated in close proximity to Lochinvar railway station and the existing level crossing.
Visual Context	The five houses in close proximity to this viewing location have varying views over the railway line, railway station and trains. The closest of these is 'Clifton Homestead'. Views vary from direct, unscreened views in very close proximity to more distant views, partially screened by vegetation. Residences on Old North Road have a more distant, but elevated view over the rail corridor. This location typifies views experienced by: Residents of Station Lane and Old North Road. Travellers along Station Lane and Old North Road.

4.4.3 Viewing Location 3 – Old North Road, Allandale

Old North Road runs from Wollombi Road, Farley in the east to Allandale Road, Allandale in the west. The area represented by this viewing location is situated near the existing small brick bridge which provides access over the rail lines, approximately 1.5km from Allandale Road. The existing visual context of this viewing location is described in Table 4-3.

Table 4-3 Old North Road Existing Visual Context

Typical Local Landscape Character	 Photo 4 - View to the west from Old North Road, Allandale. The existing rail line and can be seen at a distance of approximately 150m from the nearest house. This existing

	bridge crossing is also visible from this location.
Landform	This viewing location is situated on a ridgeline with the surrounding landform being flat to undulating landscape, sloping down to a valley to the south.
Vegetation	The vegetation of this viewing location is characterised by open pasture and grasslands, with scattered trees. Views over densely vegetated hillsides are available to the south of this viewing location.
Land Use	The area around Old North is primarily used for agricultural grazing and rural residential type development. Old North Road is closed approximately 250m east of the point that the above photo was taken. There is one residence located between the bridge, visible in the photo, and this road closure point, limiting the amount of traffic, and number of receptors, on this section of the road. It was not able to be determined if or when this road closure will be removed.
Visual Context	The Main Northern Railway Line is partially visible from this viewing location, however the line is primarily located in cut in close proximity to the viewing location, limiting close views of the railway lines and trains. This location typifies views experienced by: Residents of Old North Road. Travellers on Old North Road.

4.4.4 Viewing Location 4 – Clift Street, Greta

Clift Street is a residential street in the town of Greta. Residential development has recently taken place on the western side of Clift Street. These properties have an elevated view towards the railway line, however all elements of the railway are screened by vegetation. The existing visual context of this viewing location is described in Table 4-4.

Table 4-4 Clift Street Existing Visual Context

Typical Local Landscape Character	 Photo 5 - View to the west from 12 Clift Street Greta. The existing rail corridor is screened by existing vegetation located along Anvil Creek.
Landform	This viewing location is located on a low ridge the land sloping away from the road towards the creek and rail corridor. The hills to the west frame the views in that direction.
Vegetation	The vegetation of this viewing location is characterised by cleared land and grasslands, with scattered trees. An area of dense indigenous vegetation is visible along Anvil Creek with this also located on the hills which form the background views from this viewing location.
Land Use	The residential properties along the western side of Clift Street, where this viewing location is located, are approx 4000m^2 in area, while the older residential properties on the eastern side of Clift Street are approx 1000m^2 in area. This viewing location is located on the south western outskirts of the town of Greta, with views over agricultural pasture and Anvil Creek. The Greta railway station is located approx 450m west of this viewing location. This is a commuter station with two platforms approx 25m in length.
Visual Context	The Main Northern Railway Line is not visible from this viewing location. Views towards the line are screened by dense vegetation along Anvil Creek. This vegetation would also screen views to coal and commuter trains. This location typifies views experienced by: Residents of Clift Street.

4.4.5 Viewing Location 5 – Mansfield Street, Greta

Mansfield Street is located on the western side of the railway line, in the town of Greta. The northern section of Mansfield Street has direct access to the western platform of the Greta Railway Station and has views of the station and associated infrastructure. The remainder of Mansfield Street is separated from the station by the existing road network although some properties have direct frontage to the rail corridor. The existing visual context of this viewing location is described in Table 4-5.

Table 4-5 Mansfield Street Existing Visual Context

Typical Local Landscape Character	 Photo 6 - View to the north from 4 Mansfield Street Greta, on western side of railway line. Greta Station is visible in the foreground.
Landform	This viewing location is situated within a flat to gently undulating landscape. There is a large earth mound visible in Photo 6 which appears to be formed as a result of previous railway works. This mound, and the vegetation growing on it, provides some screening of the views of the railway station and rail lines from some of the existing residential properties.
Vegetation	Vegetation immediately surrounding the proposal consists of overgrown grasses surrounding fencelines and the earth mound adjacent to the Greta Railway Station. Young Eucalypts are growing on the earth mound and several decorative trees can be seen on the far side of the Greta Station main building. Landscaping and some mature trees are located within the residential properties located in this section of Mansfield Street.

Land Use	This viewing location is located on the outskirts of the town of Greta, and adjacent to the existing railway station. The northern end of Mansfield Street services a small cluster of residential properties. The nearest property has direct frontage to the railway corridor. A residential property located on the east side of Mansfield Street, approximately 200m south of the Nelson Street intersection, is located in close proximity to the railway line.
Visual Context	The northern section of Mansfield Street has close proximity views of the railway line, railway station, pedestrian overpass and trains. Views towards these elements from the residences along this section of the road are partially screened by vegetation. Views of the railway line and trains from the residence on the east side of Mansfield Street, south of Nelson Street are partially to fully screened by vegetation between the house and the railway line. This location typifies views experienced by: Residents of Mansfield Street and Nelson Street.

4.4.6 Viewing Location 6 – Branxton Residential Area and Rail Overpass

Wine Country Drive is a tourist route between Branxton, to the north and Cessnock, to the south. This viewing location represents views from the road and pedestrian overpass on Wine Country Drive and from the residential areas of the Branxton that are located within close proximity to the railway line. The existing visual context of this viewing location is described in Table 4-6.

Table 4-6 Branxton Residential and Rail Overpass Existing Visual Context

Typical Local Landscape Character	 Photo 7 - View to the east from Wine Country Drive overpass, Branxton. Branxton Station is located approx 500m west (behind) of this viewing location.

Landform	This viewing location is situated within a flat to gently undulating landscape with no significant landform features. Distant views are available to hilly areas, approximately 12km to the north. The railway line in this location runs in a cut in the vicinity of the overpass and the Branxton residential properties adjacent to the corridor.
Vegetation	The vegetation present on the northern and southern on the cut batters is significantly different. Vegetation on the northern side of the corridor reflects the urban nature of the land uses, with some buffering of the corridor provided through vegetation located on mounding. To the south of the rail corridor is characterised by scattered trees and grasses.
Land Use	The area to the north of the railway line is dominated by established residential properties, the majority of which are separated from the railway lines by acoustic fencing screening views and providing noise buffering. The southern side of the rail corridor is outside the urban area of Branxton with the land uses being larger rural residential type development and agricultural properties.
Visual Context	Long views of the Main Northern Railway Line are available from the Branxton rail overpass. Views of coal and commuter trains are also available from this point. Views of the railway and trains from the residential properties to the north of the line are screened by acoustic fencing that runs along the railway line. This location typifies views experienced by: Pedestrians and vehicles crossing the Wine country drive overpass. Residents of Railway Street, Branxton.

4.4.7 Viewing Location 7 – Branxton Railway Station

Branxton Railway Station is located at the south western corner of the town of Branxton. This is a commuter station, however coal trains regularly pass through the station. The existing visual context of this viewing location is described in Table 4-7.

Table 4-7 Branxton Railway Station Existing Visual Context

Typical Local Landscape Character	 Photo 8 - View to the east from Branxton Station. Proposed works would follow the railway alignment, on the south side of existing tracks.
Landform	This viewing location is situated within a flat to gently undulating landscape. Cut batters can be seen where the railway line runs east towards the Wine Country Drive overpass. To the west, the railway travels at grade before entering a cut where the railway turns out of view.
Vegetation	Dense bushland, with mature trees and grasses line the southern side of the railway line. The existing third track (not visible in this image), on the far side of the southern station platform, appears unused and is overgrown with low grasses and shrubs.
Land Use	The railway station is located on the southern edge of the urban area of Branxton. Light industrial and established residential properties adjoin the railway corridor to the north while the southern side of the corridor is characterised by rural properties. Branxton railway station provides for passenger train access and is comprised of two platforms of approx 70m length.
Visual Context	The railway line and railway infrastructure are the dominant elements in the view from this location. Coal and commuter trains are visible in close proximity from this location. This location typifies views experienced by: Commuters at Branxton railway station.

4.4.8 Viewing Location 8 - Belford Street, Belford

Belford Street runs approximately parallel to the New England Highway, east of the town of Belford and provides some views over the rail corridor, with these views screened in some locations by vegetation and topography. The existing visual context of this viewing location is described in Table 4-8.

Table 4-8 Belford Street Existing Visual Context

Typical Local Landscape Character	 Photo 9 - View to the south from Belford Street, Belford. The railway corridor is located between the dwelling and vegetation in the background of this photo.
Landform	This viewing location is situated within a flat to gently undulating landscape, with distant views to hilly terrain (Polkolbin State Forest) available to the south west.
Vegetation	The property in the foreground of this view is a cleared rural property with low grass and scattered trees. Dense bushland is present on the southern side of the railway line and frames the views in this direction. On the northern side of the New England Highway (behind this viewing location), the Belford National Park is an area of dense native vegetation that covers 294ha. There is also mature vegetation contained within the road reserve of both Belford Street and the New England Highway in the vicinity of this viewing location.
Land Use	Whilst the area surrounding the house in this image has been cleared, the surrounding land uses are largely rural in nature. The New England Highway is situated to the north of this viewing location and there is a rest stop located at the eastern end of Belford Street.

Visual Context	Whilst the railway line is located in a cut behind the residence (pictured above) and the rail lines obscured from view, it is expected that trains would still be visible from this location, due to the shallow depth of the cut and the proximity of the residence to the railway line. This location typifies views experienced by: Residents of Belford Street, Belford. Travellers on Belford Street, Belford.

4.4.9 Viewing Location 9 - Kirkton Street, Belford

Kirkton Street runs through small cluster of residential properties, located between Belford Road, to the north and the railway line, to the south. The railway line, on a raised embankment, is visible from this. The existing visual context of this viewing location is described in Table 4-9.

Table 4-9 Kirkton Street Existing Visual Context

Typical Local Landscape Character	 Photo 10 - View to the south-west from Kirkton Street, Belford. Residential properties located along Kirkton Street back onto an unconstructed road reserve adjacent to the railway corridor. The rail lines and associated embankments are visible to the south.
Landform	This viewing location is situated within a flat to gently undulating landscape. The existing large raised railway embankment visible from the houses in this area and is located approximately 70m to the south of the residences.
Vegetation	This viewing location is located within an area of scattered to dense bushland vegetation, interspersed with cleared grass areas. Vegetation on the southern side of the railway lines is predominately cleared agricultural pasture with scattered trees. On the northern side there are remnant mature trees and residential landscape surrounding the Kirkton Street residences. There is also mature vegetation contained within the constructed and unconstructed road reserves in this area.
Land Use	This viewing location is situated at the eastern extent of a cluster of small residential allotments, surrounded by larger agricultural / bushland properties. The New England Highway is situated to the north of this viewing location. The residential properties adjoin both constructed and unconstructed road reserves resulting in the properties effectively being adjacent to the railway corridor.

Visual Context	The Main Northern Railway Line is a dominant element in the view from this location. The railway is raised above the natural ground level by up to 7m, with only the tops of trees visible beyond the horizon line created by the rail embankment. Coal and commuter trains are highly visible from this location. Vegetation in the immediate foreground serves to partially screen views to the railway. This location typifies views experienced by: Residents of Kirkton Street, Belford.

5. Impact Assessment

5.1 Environmental Risk Assessment

A detailed Environmental Risk and Impact Assessment (Risk Assessment) has been conducted as part of the Environmental Assessment process to evaluate the potential impacts that the Project could have on a wide range of environmental, social and economic assets and beneficial uses, which has contributed to help form the conclusions of this study.

In summary:

- The Risk Assessment was conducted to identify the potential environmental, social and economic impacts on the wider environment and community of implementing the Project.
- Heighten confidence and provide rigour for decision making and planning.
- The Risk Assessment was based on the Description of the Project included in the Environmental Assessment and the outputs of the risk assessment represent the risk and impacts of implementing the Project as described in the Description of the Project.
- The Risk Assessment was conducted in close consultation with all of the technical specialists and is based on input provided by those technical specialists. All of the Risk Assessment inputs including consequence and likelihood ratings were provided by the technical specialists.
- Incorporates the outputs of the Community Consultation which occurred as part of the Environmental Assessment, although separate to the risk assessment process. The values and outcomes of the community consultation were incorporated to inform the risk assessment process.
- The Risk Assessment approach used a multi-disciplinary group of technical specialists to assess the consequence and likelihood of the identified risks. To assess risks consistently, consequence tables were developed that clearly define levels of consequence, from insignificant to catastrophic, in terms of magnitude, space and time. Consequence, having regard to 'reasonable worst- case scenarios' (considering activity controls), and the likelihood of that consequence occurring are defined for all identified risks and impacts, allowing risks to be ranked.
- The risk ranking was calculated via the risk matrix, considering both consequence and likelihood allocations.

Visual impacts were considered within the social impacts during the Environmental Risk and Impact Assessment. As such further discussion on the Risk Assessment is not included in this report. However it is discussed in the Environmental Risk and Impact Assessment in Appendix D of the Environmental Assessment.

5.2 Visual Impact Assessment

5.2.1 Introduction

The potential visual impacts are considered in the context of the sensitivity of the surrounding visual environment and the potential for viewing of the areas that have had changes to their visual outlook due to site works. The assessment of potential visual impacts of this project focuses on the visibility of both the construction and operation phases of the project.

5.2.2 Visual Project Elements

The Project consists of the construction of a third track adjacent to the existing two tracks of the Main Northern Railway Tracks between Farley and Minimbah. The visible project elements both during construction and operation are detailed in Table 5-1 below.

Table 5-1 Visible Project Elements

Visible Project Elements		Construction	Operation
Track	◗ New track including turnouts and junctions.	●	●
	◗ Relocation of one turnout from Minimbah to Farley.	-	-
	◗ Upgrade of maintenance siding turnouts at Branxton.	●	●
	◗ Track reconditioning of existing Up Main at Greta and Branxton Stations and of the Branxton crossovers.	-	-
Earthworks	◗ Major cut and fill earthworks along the route and other minor earthworks.	●	●
	◗ Re-alignment of Sawyers Creek.	-	-
Drainage	◗ Amendments to 54 culverts for cross drainage.	-	-
	◗ Central and cess track drainage.	-	-
	◗ Other drainage works around new structures.	-	-
Bridges	◗ A new rail underbridge at Stony Creek and Wollombi Road, Farley.	●	●
	◗ A new rail underbridge for a stock crossing at Farley.	●	●
	◗ A new rail underbridge at Allandale Road, Allandale.	●	●

Visible Project Elements		Construction	Operation
	◗ A new rail underbridge for an unnamed creek (approximate chainage 209.174 km).	●	●
	◗ Demolition of the existing rail overbridge at Nelson Street, Greta.	●	-
	◗ A new rail underbridge at Anvil Creek, Greta.	●	●
	◗ Demolition of the existing rail underbridge at Anvil Creek, Greta.	●	●
	◗ A new rail underbridge at Sawyers Creek, Greta.	●	●
	◗ Modification of the existing rail overbridge at Bridge Street, Branxton.	●	-
	◗ A new rail underbridge at Black Creek, Belford.	●	●
	◗ A new rail underbridge at Jump Up Creek, Belford.	●	●
Station Modifications	◗ A new station at Lochinvar.	●	●
	◗ Demolition of the existing Lochinvar Station.	●	-
	◗ Modifications to Greta Station.	●	-
	◗ Modifications to Branxton Station.	●	-

At the time of writing this report, construction works were being carried out as part of the Minimbah Bank Third Track project, to the west of the Project being assessed. Similar construction methods to those being used on the Minimbah Bank Third Track project would be employed as part of this Project. Images shown below of the construction works are indicative only and are representative of the sorts of visual elements that would be present in the construction of this Project.

Table 5-2 Indicative Construction Images

	Visible Project Elements include: ◗ Overpass Construction. ◗ Vegetation Clearance. ◗ Construction Fencing and Signage. ◗ Construction Machinery. ◗ Existing Railway Lines.
	Visible Project Elements include: ◗ Haul Road. ◗ Vegetation Clearance. ◗ Construction Fencing and Signage. ◗ Construction Machinery.
	Visible Project Elements include: ◗ Haul Road. ◗ Vegetation Clearance. ◗ Construction Fencing and Signage. ◗ Construction Machinery. ◗ Earthworks.
	Visible Project Elements include: ◗ Haul Road. ◗ Vegetation Clearance. ◗ Spoil / storage area. ◗ Construction Machinery. ◗ Existing Railway Lines.

5.2.3 Assessment of Landscape and Visual Impacts

The landscape and visual impacts of the project on the Landscape Character Units, viewing locations and the sensitive visual receptors have been assessed for both the construction and operational phases of the project. These impacts are addressed in the following tables.

Viewing Location 1 - Wollombi Road, Farley

Table 5-3 Wollombi Road Visual Impact

Visible Project Elements	**Construction** ◗ Vegetation and removal. ◗ Earthworks. ◗ Plant, machinery, site sheds, fencing and signage. ◗ Construction lighting. **Operation** ◗ Increased batters adjacent to the rail lines.
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be partly visible from this viewing location. Whilst the visual presence of machinery and associated construction equipment would be at odds with the current rural landscape, the horizontal nature of the work area and the backdrop views of Rutherford's industrial precinct would serve to minimise the adverse landscape impact. The presence of the existing railway line and raised batters would limit the landscape impact of the operation phase of the project. This change would be almost imperceptible from this viewing distance. It is assessed that the project would have a **negligible** landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** The visual impact from the residences on Wollombi Road would vary depending on the foreground vegetation and house orientation. Existing vegetation would provide screening of the construction works from some residences however other properties would have unscreened views. Wollombi Road is located at a higher elevation than the railway line. The photo representing this viewing location is located approximately 40m vertically above the railway line. This elevation difference can introduce background elements into view, which may dominate the view from some locations It was not possible to determine the extent of vegetation clearance along the railway line from the information available at the time of writing this report. **Operation Visual Impacts** Due to the distance of the enlarged batters from this viewing location and the small scale of the change, these works would have little visual impact on the existing visual environment from this location. Where screening vegetation is removed as part of the construction process, mitigation measures in this report recommend the planting of equivalent vegetation. It is assessed that this viewing location has a **medium** visual sensitivity.
Significance of Impact	**Not Significant**

Viewing Location 2 - Station Lane, Lochinvar

Table 5-4 Station Lane Visual Impact

Visible Project Elements	**Construction** ◗ Vegetation removal. ◗ Earthworks. ◗ Plant, machinery, fencing and signage. ◗ Construction compound (including car parking, site sheds, fuel and material, storage, stockpiles, security lighting). ◗ Modification to the Lochinvar railway station. ◗ Construction lighting. **Operation** ◗ Increased batters adjacent to the rail lines. ◗ Modified Lochinvar railway station.
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be highly visible from this viewing location and would dominate the view from this location. The constant visual presence of machinery and associated construction equipment throughout the construction phase would be at odds with the current rural landscape. The proposed construction compound would be a considerable intervention in the landscape at this location, with a mix of colour and form that is at odds with the existing landscape character. Security lighting and associated light spillage at the construction compound will impact on the existing night landscape of the area. These construction impacts will, however, be temporary in nature. The presence of the existing railway line and railway station would limit the landscape impact of the operation phase of the project. It is assessed that the project would have a **small** landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** The residence at this viewing location (Clifton) would have unscreened views of the construction works and compound in very close proximity to the activities. Other residences in the vicinity of the viewing location would have unscreened views of the construction works and compound, with residences on Old North Road having more distant but elevated views over the works. These residences would also have views over the construction compound. Night security lighting at the construction compound and associated light spillage would impact upon the visual amenity of surrounding residences. Excess light spillage may be more noticeable in rural areas where it may be in contrast to usually dark nights.

	Operation Visual Impacts Due to the distance of the enlarged batters from this viewing location and the small scale of the change, these works would have little visual impact on the existing visual environment from this location. It is assessed that this viewing location has a **high** visual sensitivity.
Significance of Impact	**Moderate Significance**

Viewing Location 3 - Old North Road, Allandale

Table 5-5 Old North Road Visual Impact

Visible Project Elements	**Construction** ◗ Vegetation removal. ◗ Earthworks. ◗ Plant, machinery, site sheds, fencing and signage. ◗ Construction lighting. **Operation** ◗ Increased batters adjacent to the rail lines, including one section extending approx 60m beyond existing railway line.
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be partly visible from this viewing location. Whilst the visual presence of machinery and associated construction equipment would be at odds with the current rural landscape, this impact would be minimised with the railway line running through a deep cut, adjacent to this viewing location. The residence to the south of the road is located at a lower elevation than the viewing location, with views oriented away from the railway line. Removal of trees and extension of the existing batters for the construction of the new rail line would be a feature of the landscape when viewed from the closest residence. This impact would be visible until rehabilitation measures have been completed. The presence of the existing railway line, bridge, fencing, earthworks and stockyard would limit the landscape impact of the operation phase of the project. This change would be almost imperceptible from this viewing distance, with the railway line located primarily in a cut, and the residence being placed and oriented away from the works. It is assessed that the project would have a **small** landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** The residence at this viewing location would have unscreened views of the some aspects of the construction however, due to the position of the house, and the track works being undertaken within a cut the extent of the visibility of the works would be limited. The most visible component of the construction would be the works undertaken to the west of the dwelling. The existing cut and rail lines are visible in this location and would be made more visually prominent with the widening of the cut and batters. **Operation Visual Impacts** Although some changes to the visual outlook would occur in close proximity to the closest residence at this viewing location, the completed rail line would be located within a significant cut which restricts visibility from sensitive receptors. Following the completion of construction the project would have little visual impact on the existing visual environment from this location. It is assessed that this viewing location has a **medium** visual sensitivity.
Significance of Impact	**Minor Significance**

Viewing Location 4 - Clift Street, Greta

Table 5-6 Clift Street Visual Impact

Visible Project Elements	**Construction** ◗ Vegetation removal. ◗ Earthworks. ◗ Plant, machinery, site sheds, fencing and signage. ◗ Construction lighting. **Operation** ◗ Batters adjacent to the rail lines (currently screened by vegetation). ◗ Trains using all three lines (currently screened by vegetation).
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be visible from this elevated viewing location. Trees would be removed along Anvil Creek, with the extent of vegetation clearing determining the extent the Project would impact on the existing visual landscape. If significant vegetation clearing is required it is anticipated that the construction works occurring within the rail corridor and the use of the completed works by trains would become visible from this location. This would impact on the visual landscape due to the proximity of the works and the change to the current vegetated foreground and background views currently available from this viewing location. It is assessed that the project would have a **moderate** landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** If vegetation is removed along Anvil Creek so as to open up views of the construction works to residences on Clift Street, this would introduce a significant visual element into the view. **Operation Visual Impacts** If vegetation is removed along Anvil Creek so as to open up views of the new rail batters to residences on Clift Street, this would introduce a new visual element into the view. Trains are currently not visible from the houses located within this development and the loss of vegetation would have a significant visual impact from these houses. It is assessed that this viewing location has a **high** visual sensitivity.
Significance of Impact	**High Significance**

Viewing Location 5 - Mansfield Street, Greta

Table 5-7 Mansfield Street Visual Impact

Visible Project Elements	**Construction** ◗ Vegetation removal. ◗ Removal of earth mound. ◗ Clearing of grass. ◗ Earthworks. ◗ Plant, machinery, site sheds, fencing and signage. ◗ Station modification works. ◗ Construction and security lighting. **Operation** ◗ Increased batters adjacent to the rail lines and hardstand. ◗ Modified station platforms. ◗ Rail track approx 17m from property boundary (currently approx 30m).
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be highly visible from this viewing location. Works would be carried out through the entire corridor in the vicinity of the Mansfield Street houses. Earthworks and other construction activities would be undertaken within very close proximity of existing residences with both screened and unscreened views available from existing residences. The existing visual landscape incorporates the rail infrastructure with this largely remaining the same following the completion of the construction works with the impact resulting from a decreased separation distance from the rail lines. It is assessed that the project would have a **moderate** landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** The residence at 4 Mansfield Street would have unscreened views to construction activities occurring in the immediate vicinity, while other properties located along Mansfield Street will largely have partially screened views of construction activities. **Operation Visual Impacts** The residences in Mansfield Street are already located in close proximity to the railway line and railway station. While the proximity of the Project elements to the residences would be reduced, they would be largely be the same form as the existing infrastructure. Therefore the sensitivity of the receptors from this viewing location, following the completion of construction activities is reduced. It is assessed that this viewing location has a **medium** visual sensitivity.
Significance of Impact	**Moderate Significance**

Viewing Location 6 - Branxton Residential and Rail Overpass

Table 5-8 Branxton Residential and Rail Overpass Visual Impact

Visualisation	 Photo 11 - Photomontage visualisation of completed works from Viewing Location 6 This photomontage shows an indicative representation of the view from Viewing Location 6 after the completion of all construction works. The proposed 3rd track, wider batters, access tracks and vegetation clearing are shown in this view.
Visible Project Elements	**Construction** ◗ Removal of scattered trees. ◗ Clearing of grassland. ◗ Earthworks. ◗ Plant, machinery, site sheds, fencing and signage. ◗ Construction lighting. **Operation** ◗ Increased batters adjacent to the rail lines and wider rail hardstand area. ◗ Third rail line
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be highly visible to pedestrians from the elevated viewing location provided by the rail overpass, although there will be limited visible from existing residences located adjacent to the rail corridor. The construction works will result in an increase in the distance between the tops of the earthworks batters from approx 35m to approx 50m at this location, although the cutting which the rail line will be located would limit the landscape impact of the operation phase of the project particularly when viewed from the residential properties. The landscape impact from the overpass would also be minimal due to the nature of the existing view and the nature of the proposed works.

	Some scattered trees will be required to be removed along the rail line, in close proximity to the view, this is not considered to have a significant impact on the visual landscape from this viewing location. Approximately 850m west of this viewing location, there is an area of dense vegetation within which some vegetation clearing will be required. While this clearing will be visible from this location to separation distance the lack of closer visual receptors minimises the visual landscape impact of these works. It is assessed that the project would have a **small** landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** The views from this location are largely restricted to pedestrians crossing the bridge with some screen views also available to residences within close proximity of the rail corridor. The views from pedestrians are transient in nature and are only experienced for a short period of time. Whilst construction works would be highly visible from this viewing location, the very short viewing times reduce the sensitivity of the receptors to these impacts. This location would also be an opportunity for interested people to view the construction activities. This is not considered to increase the visual sensitivity of this location as this would represent people seeking out the opportunity to view the construction. **Operation Visual Impacts** Due to the existing views of the railway corridor and earthworks batters from this location, the Project elements are not expected to make a significant visual impact during the Operation stage. The nature of the activities undertaken within the corridor will remain the same. It is assessed that this viewing location has a **low** visual sensitivity.
Significance of Impact	**Not Significant**

Viewing Location 7 - Branxton Railway Station

Table 5-9 Branxton Railway Station Visual Impact

Visible Project Elements	**Construction** ◗ Removal of scattered trees and groups of trees. ◗ Construction compound (including car parking, site sheds, fuel and material, storage, stockpiles, security lighting). ◗ Earthworks. ◗ Plant, machinery, site sheds, fencing and signage. ◗ Construction lighting. **Operation** ◗ Increased batters adjacent to the rail lines. ◗ Additional rail lines.
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be highly visible from this viewing location. The current view from this location is of a rail focussed environment. Visible elements include multiple rail lines, railway platforms, signals, signage, earthworks batters and the Wine Country Drive overpass. Whilst the visual presence of machinery and associated construction equipment would be very evident from this location, these works are short term in nature and will result in only temporary changes to the visual landscape. The additional works and structures will be visible from people accessing the rail platform with the completed works will be not be uncharacteristic within the existing visual landscape. A construction compound would be located to the north west of this viewing location, between the railway line and the New England Highway. This compound would be located in cleared agricultural land. The mix of colour and form in the compound would be at odds with the existing landscape character of the site. Security lighting could cause some light spillage, however with the compound located near the town of Branxton, this would serve to lessen this impact on the night landscape. These impacts would be temporary in nature. It is assessed that the project would have a **small** adverse landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** Rail patrons and rail workers would have direct, unscreened views of the construction works being undertaken at this location. These views are largely short term in nature due to people arriving and departing on trains. Whilst the construction compound would be spread over a large area, views to the site from residences in Branxton would be screened by existing vegetation and structures. Views of the compound would be available to travellers on the New England Highway, however these views will be transient in nature. Security lighting at the construction compound could be visible from the western edges of Branxton and some light spillage could be noticeable, affecting the visual amenity of residents, however the sites proximity to an urban area would serve to lessen this impact. It is assessed that this viewing location has a **low** visual sensitivity.

	Operation Visual Impacts Due to the nature of the existing views from this location, any visual impacts in the operation stage of the Project are not expected to be significant.
Significance of Impact	**Not Significant**

Viewing Location 8 - Belford Street, Belford

Table 5-10 Belford Street Visual Impact

Visible Project Elements	**Construction** ◗ Removal of scattered trees and groups of trees. ◗ Earthworks. ◗ Plant, machinery, site sheds, fencing and signage. ◗ Construction lighting. **Operation** ◗ Increased batters adjacent to the rail lines. ◗ Trains in closer proximity to residence.
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be highly visible from this viewing location, in particular residences located on Belford Street adjacent to the railway corridor. The existing cut batter on the northern side of the railway line is located approximately 65m from the residence with this separation distance reducing to 40m from the residence with the construction of the third line. Whilst coal trains are presently a regular fixture in the visual landscape from this location, the constant visual presence of machinery and associated construction equipment would be very evident from this location, particularly with the removal of additional vegetation. The project elements will remain the same as those currently present in the visual landscape, however the separation distance with the less and therefore there will be a minor impact on the overall visual landscape from this viewing location. It is assessed that the project would have a **moderate** landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** The closest residence to the corridor on Belford Street would have unscreened views of construction activities occurring within the immediate vicinity, to the south of the house. **Operation Visual Impacts** The residence at Belford Street is already located in close proximity to the railway line (approx 65m distance to cut batters). While the proximity of the Project elements to the residences would be reduced, they would be much the same in form as the existing elements. The reduction in the proximity to the rail corridor and the loss of some vegetation which provide a visual backdrop would result in a visual impact on the existing visual environment from this location. It is assessed that this viewing location has a **medium** visual sensitivity.
Significance of Impact	**Moderate Significance**

Viewing Location 9 – Kirkton Street, Belford

Table 5-11 Kirkton Street Visual Impact

Visible Project Elements	**Construction** ◗ Removal of scattered trees and groups of trees. ◗ Earthworks. ◗ Plant, machinery, site sheds, fencing and signage. ◗ Construction lighting. **Operation** ◗ Increased batters adjacent to the rail lines. ◗ Trains in closer proximity to residence.
Landscape Impact	**Construction and Operation** The construction works associated with the Project would be highly visible from residences within this viewing location. Vegetation clearing and the construction of new batters for the third line will impact on the visual landscape of the properties in this location through the opening up the views of the railway line currently available. Whilst coal trains are presently a regular fixture in the visual landscape from this location, the visual presence of machinery and associated construction equipment would be very evident in the visual landscape from this location. However the most significant landscape impact will be from vegetation clearing and the extension of the earthwork batters. Rehabilitation and landscaping of the batters will assist in minimising the long term landscape impact of the construction works however the proximity of the works to the existing residences will impact on the visual landscape. It is assessed that the project would have a **large** landscape impact from this viewing location.
Visual Impact	**Construction Visual Impacts** The residences located near the viewing location in Kirkton Street and Branxton Street would have partially screened views to construction activities occurring in the immediate vicinity. The loss of vegetation and the presence of construction equipment within close proximity to the houses will impact on the existing visual amenity during this phase of the project. **Operation Visual Impacts** The residences in this location are already located in close proximity to the railway line with screened views of the batters and trains using the network. Rehabilitation and landscaping of the batters will assist in minimising the long term visual impact from these sensitive receptors. It is assessed that this viewing location has a **medium** visual sensitivity.
Significance of Impact	**High Significance**

6. Mitigation Measures

6.1 Introduction

The aim of this section is to identify mitigation measures that would reduce and/or manage adverse impacts of both the construction and operation stages of the project on the landscape character and visual amenity.

6.2 Construction Phase

The project aims to achieve construction without causing undue visual disruption to receptors. The following mitigation measures are recommended for this project:

- Avoid loss or damage to vegetation within the rail corridor and adjacent road reserves and private property including the protection of trees prior to construction and/or trimming of vegetation to avoid total removal. This includes vegetation that makes a significant and positive contribution to landscape character and/or provides screening to adjacent properties.
- Minimise light spillage through designing the construction and operation lighting to ensure the sites are not over-lit and to minimise additional light spillage from the rail corridor into adjacent visually sensitive properties. This includes the sensitive placement and specification of lighting to minimise any potential light pollution.
- Temporary hoardings, barriers, traffic management and signage to be removed when no longer required.
- Materials and machinery to be stored tidily during the works.
- Roads providing access to the rail corridor and work sites to be maintained free of dust and mud as far as reasonably practicable.

6.3 Operation Phase

The following mitigation measures are recommended:

Ensure early involvement of Landscape Architects to ensure that the project's visual and landscape impacts are minimised during both construction and operation phases. This would include, but not be restricted to:

- Integration of infrastructure (e.g. acoustic barriers, structures, embankments/cuttings, bridges, etc) into the surrounding environment.
- Minimisation of vegetation clearance in sensitive environmental areas.
- Minimisation of vegetation clearance in areas where the vegetation provides screening of the rail corridor to sensitive receptors.
- An integrated and consultative design process and interface amongst specialist disciplines resulting in optimal design solutions.
- Ensure landscape solutions are buildable within the site boundary from the outset unless agreed by adjoining landholders.

- Demonstrate that environmental, landscape and urban design issues have been adequately considered as part of an integrated design process resulting in a positive legacy for the project.
- Early identification of landscape 'hot spots' and integration of mitigation strategies to minimise landscape and visual impacts.
- Development of a Landscape Rehabilitation Strategy and Landscape Strategy that draws together the outcomes of the above integrated design and assessment process.
- Consultation with affected residents on desired screening.
- Maintenance of screening planting following the establishment phase to ensure continual / improved visual screening over time.

7. Conclusion

The landscape and visual impacts of the project are assessed as being of moderate significance. A moderately significant impact is one that, whilst some noticeable impact will occur, it is within reasonable limits and not excessive or extreme. Due to the nature of the project there would be a permanent impact on the visual landscape and amenity of some locations along the Project alignment. The landscape and visual impacts of the project would occur both during the construction and operation phases of the project.

A summary of the outcomes of this assessment are detailed in Table 7-1.

Table 7-1 Summary of Impacts

Viewing Location	Landscape Impact	Visual Sensitivity	Significance of Impact
1 – Wollombi Road, Farley	○	◑	○
2 – Station Lane, Lochinvar	◔	◕	◑
3 – Old North Road, Allandale	◔	◑	◔
4 – Clift Street, Greta	◑	◕	◕
5 – Mansfield Street, Greta	◑	◑	◔
6 – Wine Country Drive overpass, Branxton	◔	◔	○
7 – Branxton railway station, Branxton	◔	◔	○
8 – Belford Street, Belford	◑	◑	◑
9 – Kirkton Street, Belford	◕	◑	◕

○ Negligible Landscape Impact / Negligible Visual Sensitivity / Not Significant Impact

◔ Small landscape Impact / Low Visual Sensitivity / Minor Significance of Impact

◑ Moderate Landscape Impact / Medium Visual Sensitivity / Moderate Significance of Impact

◕ Large Landscape Impact / High Visual Sensitivity / High Significance of Impact

● Major Significance of Impact

8. References

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