CHAPTER 10

Landscape and Visual Amenity

GOWRIE TO HELIDON ENVIRONMENTAL IMPACT STATEMENT

IR_1536

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

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10.1 Summary

A Landscape and Visual Impact Assessment (LVIA) was undertaken for the Gowrie to Helidon (G2H) Inland Rail Project (the Project) in accordance with the Terms of Reference (ToR) and relevant standards and guidelines. The assessment describes the existing landscape or visual values of the LVIA study area (~10 kilometre (km) buffer around the Project) and identifies landscape, views and visual receptors likely to experience impacts on these landscape and visual values from the Project. The assessment also identifies key Project risks to the landscape and visual values, evaluates the significance of any impacts on landscape, views and visual receptors and outlines proposed mitigation and management measures.

The landscape surrounding the Project is highly varied, comprising irrigated agriculture and dry croplands and pastures interspersed with a network of creeks through the Toowoomba Plateau, with densely vegetated landscapes associated with the Great Dividing Range. The West Moreton System rail corridor and Toowoomba Bypass are significant linear features present in parts of the LVIA study area.

The key landscape and visual impacts of the Project relate to the removal of vegetation, the raising of embankments and the creation of new rail bridges and viaducts up to 45 metres (m) high. Eight landscape character types (LCTs) have been identified throughout the LVIA study area, seven of which are potentially affected by the Project with impacts of up to 'Major' significance on the landscape character and amenity of one LCT—LCT G: Forested Uplands. This is due in part to the Project being primarily situated in this LCT, and the LCT being the dominant LCT in the LVIA study area.

Impacts of up to 'Moderate' significance were identified for four LCTs:

- LCT C: Dry Croplands and Pastures (primarily in the Gowrie area)
- LCT D: Vegetated Grazing (Lockyer Valley east of Wards Hill)
- LCT E: Rural Settlement (such as Gowrie and Toowoomba)
- LCT F: Rural Living (e.g. parts of Postmans Ridge and Helidon Spa).

These impacts relate to direct impacts of cuts and embankments on the rural landscape and the settling of landscape areas.

For part of the LVIA study area, there are relatively few visual receptors with the landscape comprising isolated farmsteads set on large private farms. However, the landscape around Toowoomba is quite densely settled, with numerous settlements located within the potential viewshed of the Project. This includes suburbs to the north and east of Toowoomba, Gowrie Mountain, Gowrie Junction (herein referred to as Gowrie), Kingsthorpe, Withcott, Postmans Ridge, Helidon Spa and Helidon. Visual impacts are typically contained by the presence of vegetation, including along creek lines, and localised undulations in landform. Visual impacts are also contained through the use of a tunnel for a significant length of the Project. Elevated and panoramic views over the Project are also available from the edge of Toowoomba and the Forested Uplands associated with the Toowoomba Range, scenic lookouts, walking trails within public parks including Jubilee Park, Redwood Park, and Picnic Point Parklands and residential properties with views towards the Project, as well as from parts of the Toowoomba Bypass.

As part of the LVIA, 20 representative viewpoints were selected and assessed for both construction and operation phases of the Project. During construction, the greatest visual impact identified was up to High significance, relating to three viewpoints:

- Viewpoint 13: Keira Court, Blue Mountain Heights looking south-east
- Viewpoint 14: Katoomba Point Lookout, Prince Henry Heights looking north
- Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville.

Other impacts of up to Moderate significance are anticipated at seven other viewpoints.

For visual impacts during operation, seven visual impacts of up to 'High' significance were identified:

- Viewpoint 4: Near 10 Paulsens Road, Gowrie Junction, looking south-west towards Gowrie Junction Road bridge
- Viewpoint 5: Near 14 Junction Street, Gowrie Junction, looking east towards western tunnel portal
- Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights
- Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights

- Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville
- Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west
- Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north.

These impacts relate to elevated views from significant locations over the wider Project or viewpoints situated in close proximity to the Project. Other visual impacts during both construction and operation are of lower significance, typically relating to views experienced by relatively small numbers of homesteads or with a lower magnitude of change to the existing view.

Three viewpoints will experience visual impacts of up to High significance during construction and operations:

- Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights
- Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights
- Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville.

These viewpoints are located on top of the Great Dividing Range overlooking Lockyer Valley, where the Project is predominantly located.

For lighting impacts, the most significant effect during construction is up to Moderate for Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass. The greatest impact identified during operation is up to 'Low' significance for 13 viewpoints, with these viewpoints also have a Low significance during construction.

Cumulative impacts, particularly the effects in combination with the adjoining Border to Gowrie (B2G) and Helidon to Calvert (H2C) Inland Rail projects have been considered. Cumulative impacts during both construction and operation are considered to be up to Medium consequence, due to the potential for localised areas (particularly the area around Gowrie Mountain in the west of the Project) to be affected by multiple infrastructure and building projects, dependent on Project phasing. There are no identified cumulative impacts associated with night lighting.

10.2 Scope of chapter

The key objectives of the LVIA are:

- To undertake a baseline assessment describing existing environmental values of the LVIA study area with respect to landscape character and visual amenity including scenic viewpoints
- To describe the existing landscape or visual values including reference to any values identified in planning schemes (landscape receptors) and identify those people who experience and value views of the landscape (visual receptors)
- To identify key Project risks on landscape and/or visual values during the day (and during the night (lighting impact assessment)
- To evaluate the significance of the impacts of the Project activities on landscape, views and visual receptors during construction and operation phases of the Project during the day and night including cumulative impacts
- To describe any Project modifications or management techniques that can mitigate identified landscape and visual impacts and consider the likely significance of residual impacts once these measures have been implemented
- To illustrate the visual impacts using visualisation techniques to assist members of the public in understanding potential impacts.
- Project Terms of Reference

The ToR describe the matters the proponent must address in an EIS for the Project. The following matters relating to landscape and visual amenity are described in Table 10.1.

TABLE 10.1 TERMS OF REFERENCE REQUIREMENTS

Terms of Reference Requirements		Addressed in chapter
Existing Environment		
11.81.	Describe and illustrate the existing landscape character and environment, including key natural landscape features, major views, view sheds and outlooks that contribute to the amenity of the area	Section 10.5 Appendix H: Landscape and Visual Impact Assessment, Sections 5.1, 5.3, 7 and 8.

Terms of Reference Requirements		Addressed in chapter
Impact Assessment		
11.82.	Describe and illustrate the visual impact of the construction and operation of the project. Include major views, view sheds, outlooks, and features contributing to the amenity of the area. Such views should be representative of public and private viewpoints, including places of residence, work, and recreation	Section 10.6.3 and Section 10.7.3 Appendix H: Landscape and Visual Impact Assessment, Section 8.
11.83.	Address the findings, requirements and recommendations of South East Queensland Regional Plan 2005–2026 Implementation Guideline No 8—Identifying and Protecting Scenic Amenity Values (2007)	Section 10.6.2 Appendix H: Landscape and Visual Impact Assessment, Sections 3.2 and 7.
Mitigation Measures		
11.84.	Describe any proposed measures to avoid, minimise or mitigate potential impacts on landscape character and visual amenity	Sections 10.7.1 and 10.7.2 Appendix H: Landscape and Visual Impact Assessment, Section 11.
Proposed construction and operations		
10.11.	Describe the following information about the proposed project: Landscaping and the rehabilitation of affected areas after construction and during operation	Section 10.7.2 Appendix H: Landscape and Visual Impact Assessment, Sections 6 and 11.

10.3 Policies, Standards and Guidelines

Table 10.2 discusses the relevance of the legislative or policy level objectives and standards (whether qualitative or quantitative) that exist to protect or manage landscape and visual values in the context of the Project. An overarching and broad discussion of legislation, policies, standards and guidelines are presented in Appendix H: Landscape and Visual Impact Assessment.

Similarly, landscape and visual impacts on views between adjoining local council areas have been considered, along with the policies applying to adjacent jurisdictions at the local level.

TABLE 10.2 REGULATORY CONTEXT

Legislation, policy or guideline	Relevance to the Project
National	
Australian Standard AS4282-1997: Control of the obtrusive effects of outdoor lighting (Standards Australian, 1997)	This standard sets out guidelines for the control of the obtrusive effects of outdoor lighting and gives recommended limits for the relevant lighting parameters to contain these effects within tolerable levels. It refers to the potential effects of lighting systems on receptors including nearby residents and users of adjacent roads. It does not apply to road lighting or lighting systems that are of a cyclic or flashing nature. Lighting is proposed during the construction and operation of the Project and is discussed in Chapter 6: Project Description and Table 10.11. This standard is also required for consideration as part of the Dis-5 Light Pollution credit in the Infrastructure Sustainability (IS) Rating Scheme (refer Chapter 7: Sustainability).
Australian Standard AS4970-2009: Protection of trees on development sites (Standards Australian, 2009b)	This standard provides guidance on the principles for protecting trees on land subject to development. Where development is to occur, the standard provides guidance on how to decide which trees are appropriate for retention, and on the means of protecting those trees during construction work. The standard does not apply to the establishment of new trees.

Legislation, policy or guideline	Relevance to the Project
Disability (Access to Premises—Buildings) Standards 2010 These standards take effect subject to subsection 31(4) of the *Disability Discrimination Act 1992* (Cth)	This is a legislative standard that provides a nationally applicable set of provisions that detail what must be provided for non-discriminatory access to public buildings for people with a disability. The Project is mostly located in a rural area within freehold land with restricted access to the general public, limiting the applicability of the Disability (Access to Premises—Buildings) Standards. However, accessibility needs to be considered where the Project passes through settlements, in recreational areas, adjacent recreation trails and walkways where people may be present close to the Project, and along the Toowoomba Range Tunnel and viaduct structures, to provide appropriate emergency egress due to the potential future use of the Project area for passenger rail.
Queensland (State level)	
Road Landscape Manual (2nd Edition) (Department of Transport and Main Roads (DTMR), 2013a)	This manual aims to facilitate the understanding of, and procedures associated with, the assessment, design and management of roads as they affect the Queensland landscape. It sets out principles for the design of roads to assist in their integration in their natural, cultural and urban landscape settings. Appendix 2 of the manual describes the process for visual assessment required in the planning and design of Queensland roads. The Project requires the realignment and redesign of several local and State-controlled roads (refer Chapter 6: Project Description for details).
Crime Prevention through Environmental Design (Queensland Government, 2007)	The *Crime Prevention through Environmental Design (CPTED) Guidelines* for Queensland seek to promote the incorporation of CPTED principles into the planning, design and management of development in Queensland. They aim to guide and encourage public and private developers to design with CPTED in mind. The Project is mostly located in a rural area within privately owned land with restricted accessibility to the general public limiting the applicability of the CPTED guidelines. However, CPTED needs to be considered where the Project passes through settlements and in recreational areas or adjacent to recreation trails and walkways where people may be present close to the Project.
Queensland (Regional level)	
*South East Queensland Regional Plan (*ShapingSEQ*)* (Department of Infrastructure, Local Government and Planning (DILGP), 2017a)	The *South East Queensland (SEQ) Regional Plan 2017*, also known as *ShapingSEQ*, is the regional plan for the SEQ region. It was given effect on 11 August 2017. The region includes the local government areas (LGAs) of Toowoomba (part only) and Lockyer Valley, through which the Project passes or that fall within the LVIA study area. Almost all of the LVIA study area falls within this region except for a small portion to the west of Kingsthorpe. *ShapingSEQ* provides a regional framework for growth management, and sets planning direction for sustainable growth, global economic competitiveness and high-quality living including ensuring land use and infrastructure planning are integrated, valuing and protecting the natural environment including landscapes, and supporting rural communities. The plan is supported by a range of background papers and is structured around the key themes of Grow, Prosper, Connect, Sustain and Live: ▸ The 'Prosper' and 'Connect' themes of the plan supports investment in upgrades and the provision of new infrastructure, including the Melbourne to Brisbane Inland Rail that 'will reinforce SEQ as the apex of Australia's strategic freight network' ▸ The Sustain theme of the plan highlights the importance of 'valuing and protecting our greatest assets—our regional landscapes and natural systems that sustain us'.

Legislation, policy or guideline	Relevance to the Project
South East Queensland Regional Plan 2009–2031 (SEQRP) Implementation Guideline No. 8 Identifying and protecting scenic amenity values (DILGP, 2007)	This guideline was developed to assist SEQ local governments to voluntarily implement policies of the SEQRP relating to scenic amenity and regional landscape values. It was developed to support the (now superseded) Scenic Amenity policies of the SEQRP but is still referenced as the SEQ regional amenity methodology in the current regional plan *ShapingSEQ*. The guideline establishes an assessment methodology for determining acceptable proposed development in areas of high scenic amenity. This methodology centres around key concepts of scenic amenity, scenic preference, public viewing locations, scenic landscape areas and view corridors. This simplistic empirical methodology for development assessment is only applicable to high scenic value areas (which are only mapped for the eastern extent of the LVIA study area) and is, therefore, not suitable to use for the LVIA assessment method for the Inland Rail Program. Key concepts within this guideline have, however, informed the LIVA methodology. The approach used in this LVIA is consistent with standard international (including Queensland) LVIA practice and recognises the need to consider landscape and visual impacts across the LVIA study area, including impacts on areas of more local scenic amenity value to the community taking a defined qualitative approach.
Darling Downs Regional Plan (Department of State Development, Infrastructure, Local Government and Planning, (formerly the Department of State Development, Infrastructure and Planning, 2013)	The Darling Downs Regional Plan provides strategic direction and policies to deliver regional outcomes which align with the State's interests in planning and development. It is focused on delivering regional policy aimed at achieving specific regional outcomes. The region includes parts of the Toowoomba LGA through which the Project passes. The western extent of the LVIA study area is located within the Darling Downs Region, of which the Darling Downs Regional Plan applies as the relevant statutory regional plan. Key regional policies are to protect Priority Agricultural Land Uses while supporting co-existence opportunities for the resources sector and provide certainty for the future of towns in the region. The plan also emphasises the importance of the region for freight connectivity, noting the eastern Darling Downs is at the junction of several strategic highways and railway lines and is the major transport and service hub of the region.
Local level	
Toowoomba Regional Council (TRC) Planning Scheme (TRC, 2012)	The Toowoomba Regional Planning Scheme is the relevant assessment benchmark for assessing development within the Toowoomba LGA. The planning scheme divides the area into zones with associated codes including specific overlay codes associated with scenic amenity. The Project predominantly traverses land zoned as Rural, however also passes through areas with High-Impact Industry, Community Facilities, Limited Development, Low-Density Residential, Emerging Community and Rural Residential zonings.
Toowoomba Regional Council—Scenic Amenity Study 2009 (Conics, 2009)	This document provides a comprehensive inventory and assessment of scenic quality within the Toowoomba region, to identify areas of strategic significance with respect to their visual contribution to the regional image. This study has been based on the approach detailed in the *South East Queensland Regional Plan 2005–2026* Implementation Guideline No. 8 'Identifying and protecting scenic amenity values' (Queensland Government, 2007) and has applied a quantitative method to the process of assessment of scenic values.

Legislation, policy or guideline	Relevance to the Project
Toowoomba Regional Council—Open Space Strategy 2016 (TRC 2016a)	The Open Space Strategy maps out a new vision that recognises that 'one size does not fit all' and that a range of open spaces will be needed across the region. It will deliver a connected and distinctive open space network that will enhance the unique character of each locality. In addition, it will acknowledge the social, cultural, environmental, and heritage values of these areas and create a sense of place and pride for the community. This strategy provides a framework for protecting, enhancing and managing open spaces. It recognises the importance of open space and includes provisions for amenity and rural landscape as follows: ▸ Goal 2: Retain and integrate existing vegetation and landscape features to provide visual amenity ▸ Objective: Provide attractive environments to live and play ensuring a network of open space that integrates with existing vegetation and preserves landscape features.
Toowoomba Regional Council—Heritage and Urban Character Study (Brannock and Associates, 2010)	The Toowoomba Regional Council Heritage and Urban Character Study examines the non-indigenous cultural heritage and character values and resources of the regional council area. Recommendations and options arising from the study have been used to inform the Toowoomba Regional Planning Scheme. The purpose of the 'Code setting out assessment benchmarks' (in Schedule 2 of the *Queensland Heritage Act Regulation 2015)* is to provide for the conservation of local heritage places by (amongst other things): (c) protecting, as far as practicable, the materials and setting of local heritage places.
Toowoomba Regional Community Plan (TRC, 2014c)	The Toowoomba Regional Community Plan articulates the long-term vision, goals, and priorities of the local communities of the region, with some direct relevance to the protection of landscape character and regional landscape values. The plan outlines a number of themes to guide community development in the region.
West Toowoomba Land Use Investigations (TRC, 2016b)	West Toowoomba Land Use Investigations is part of a series of local planning investigations by TRC to guide sustainable growth and development in the Toowoomba Region. Projected population growth, investment in major transport infrastructure (Gore and Warrego Highways, Toowoomba Bypass, Brisbane West Wellcamp Airport) and Inland Rail are all key drivers of this study. The LIVA study area is situated between Toowoomba City and the Toowoomba Enterprise Hub (Charlton Wellcamp) and is bounded by the Toowoomba Bypass (now part of the Warrego Highway) to the west, Gore Highway to the south, rail line in the north and Boundary Street in the east. It includes the localities of Cotswold Hills, Torrington, Glenvale West and Westbrook. The report outlines 10 key strategic directions to guide development in the region.
West Toowoomba Land Use Investigation Study Compendium — Background Information (TRC, 2016c)	This report summarises the findings of the *Scenic Amenity and Landscape Character Assessment* (Jensen Planning + Design, 2016) and recognises the importance of significant natural environmental features of ridgelines, vegetated peaks and watercourses, as well as unique views and vistas. The rural landscape character is also identified as being significant within the area.
Highfields, Meringandan & Meringandan West Local Plan Report (Deicke Richards, 2013)	The report has a section titled 'Scenic Amenity & Greenspaces' that states: '...the area contains significant scenic amenity with rural uses and views in the west and greenspace views in the east. It also contains some regional greenspace in TRC ownership, with several large blocks along the eastern escarpment containing important biodiversity values. Development in greenfield areas must ensure that views and vistas are maintained to protect the scenic values of the locality. The preservation of existing and planned biodiversity corridors will contribute to maintaining the scenic amenity within the area.'

Legislation, policy or guideline	Relevance to the Project
Draft Lockyer Valley Planning Scheme (LVRC, pending)	LVRC is in the process of producing a draft *Lockyer Valley Planning Scheme*. As at April 2020, a proposed planning scheme had been prepared and is currently undergoing review by the Queensland Government. Following state government review and approval, the proposed planning scheme will be released for public consultation. Until its adoption, the planning schemes currently in force and effective across the Lockyer Valley LGA area are those of the former Gatton and Laidley Shires, which were in place when these Shires were amalgamated to form the LVRC on 15 March 2008.
Gatton Shire Planning Scheme (LVRC, 2007)	The Gatton Shire Planning Scheme regulates development across the former Gatton Shire Council Area (with the exception of the area that is subject of the Grantham Reconstruction Area Development Scheme). The planning scheme divides the area into zones with associated codes. The LVIA study area primary crosses land zoned 'Rural—Agricultural' and 'Rural —General'. However, it also intersects land zoned as 'Urban Residential', 'Open Space and Recreation', 'Industrial', 'Commercial', 'Community Facility', 'Park and Residential', 'Rural Residential (Existing Rural Residential)', 'Rural Residential (Homestead Residential)'.
Scenic Amenity of the Lockyer (Forest Images, 2002)	This document provides a comprehensive inventory and assessment of scenic quality within the Lockyer region and proposes a series of management objectives that will protect, maintain, and enhance scenic amenity. This study has been based on the approach developed by the Regional Landscape Strategy Advisory Committee (RLSAC), which was developed in response to the Regional Framework for Growth Management (RFGM) (SEQ 2021, 2000) This document includes recommendations and strategies for the management of scenic amenity, that informed the development of the planning schemes of Gatton, Laidley, and Esk Shires. Identified areas of high scenic preference within the LVIA study area include: Part of the Great Dividing Range from Glen Rock to the vicinity of Toowoomba Parts of Helidon Hills near gorges and peaks.
Grantham Reconstruction Area Development Scheme (Queensland Reconstruction Authority, 2011)	While the Project does not directly impact land covered by the Grantham Reconstruction Area Development Scheme, zoned for 'Community Purposes', it falls within the LVIA study area. Land impacted by the Inland Rail Program is shown in the plan as future dedication to the DTMR. This land is intended to house a significant showground site for the Lockyer Valley. The precinct will cater for a broad range of events, including large agricultural and industry shows that require a significant area of land. The land use plan includes the proposed future rail corridor. Therefore, the future intent to construct a railway through the Showgrounds precinct is consistent with the expectations for the area following the gazettal of the Gowrie to Grandchester rail corridor.

In accordance with Schedule 6, Part 5, Section 26(2) of the Planning Regulation 2017, development for the construction of transport infrastructure, where the infrastructure is government supported transport infrastructure, cannot be made assessable development under the relevant local categorising instruments. Consequently, the provisions of the planning schemes listed in Table 10.2 do not apply to the Project. However, the zoning intent for these areas as determined by the planning schemes have been taken into consideration when determining impacts of the Project on landscape and visual amenity in the area.

The following documents that apply to New South Wales (NSW) have also been considered and, where relevant, applied to the LVIA process for this Project to ensure consistency of approach for the landscape assessment and mitigation approach across the Queensland and northern NSW sections of the Inland Rail Program:

- Beyond the Pavement: Urban design policy, procedures and design principles (Road and Maritime Services (RMS), 2014)
- The Environmental Impact Assessment Practice Note—Guideline for Landscape Character and Visual Impact Assessment EIA–N04 (practice note EIA-N04) (Roads and Traffic Authority (RTA), 2018)

- Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW (RMS, 2012)
- NSW Sustainable Design Guidelines Version 4.0 (Transport for New South Wales, 2017)
- Crime prevention and the assessment of development applications (DUAP, 2001)
- Urban Green Cover in NSW—Technical Guidelines (NSW OEH, 2015)
- Healthy Urban Development Checklist (NSW Health, 2009).

10.4 Methodology

The LVIA methodology has been developed with reference to guidelines and techniques used in Australia and internationally, including:

- *Guidance Note for Landscape and Visual Assessment* (GNLVA) (Australian Institute of Landscape Architects (AILA) Queensland, 2018)
- Guidelines for Landscape Character and Visual Impact Assessment—Environmental impact assessment practice note EIA-N04 (Roads and Maritime Services (RMS), 2018)
- *Guidelines for Landscape and Visual Impact Assessment—Third edition* (Landscape Institute and Institute of Environmental Management and Assessment, 2013)
- *Guidelines for Landscape and Visual Impact Assessment—Second edition* (Landscape Institute and Institute of Environmental Management and Assessment, 2002)
- South East Queensland Regional Plan Implementation Guideline No. 8 Identifying and protecting scenic amenity values (DILGP, 2007)
- Technical Guidance Note: Photography and Photomontage in Landscape and Visual Impact Assessment, Public Consultation Draft 2018-06-01 (Landscape Institute, 2018)
- Landscape Institute Advice Note 01/09: Use of photography and photomontage in landscape and visual assessment (Landscape Institute, 2011)
- Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity (Scottish Natural Heritage and The Countryside Agency, 2006)
- Australian Standard 4282-1997—Control of Obtrusive Effects of Outdoor Lighting
- Guidance Notes for Reduction of Obstructive Lighting (The Institution of Lighting Engineers UK, 2005).

The methodology is a significance assessment as described in Chapter 4: Assessment Methodology. The significance assessment method has been applied to environmental values that will be impacted by the Project, where impacts cannot be quantified. The LVIA methodology has defined its own thresholds for sensitivity and magnitude, discussed in Sections 10.4.2.1 and 10.4.2.2, with criteria more widely used for the assessment of landscape and visual impacts in preference to those outlined in Chapter 4: Assessment Methodology. The descriptions for sensitivity and magnitude are illustrative as there is no defined boundary between the levels of impacts.

Table 10.3 provides a summary of the LVIA methodology, which is discussed further in Appendix H: Landscape and Visual Impact Assessment.

TABLE 10.3 LANDSCAPE AND VISUAL IMPACT ASSESSMENT METHODOLOGY

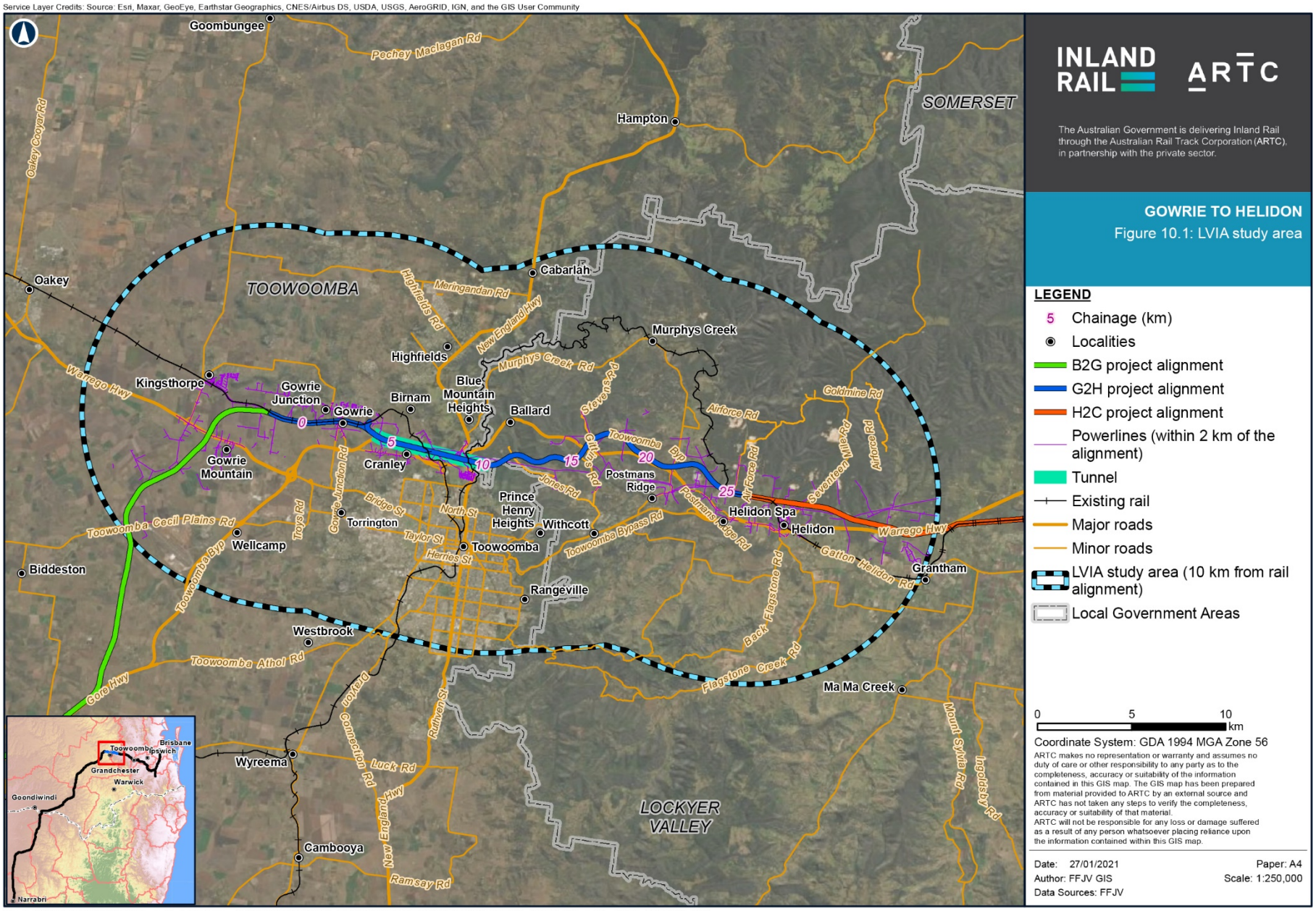
Method	Description
Desktop assessment	A desktop analysis of existing landscape character and visual amenity for the LVIA study area was undertaken to inform this assessment. Sources identified and reviewed through the desktop analysis include: ▸ Relevant planning schemes, policies and guidelines from local councils and the State government ▸ Publicly available information on recreation spaces and public visitor areas ▸ Traffic count data, based on traffic census data for the Queensland state-declared road network (2019) and is generally consistent with the traffic and transport assessment undertaken as part of the EIS ▸ Digital aerial photography (Google Earth 2020 and ESRI) ▸ Cadastral data (showing roads, property boundaries and built areas) ▸ Queensland bioregion data Interim Biogeographic Regionalisation for Australia (IBRA) Environmental Resources Information Network (ERIN) ▸ ARTC-provided LIDAR survey, resampled to 20 m ▸ Geoscience Australia Digital Elevation Model (DEM-S-1S) data—landform and topography ▸ *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool—Matters of National Environmental Significance ▸ Department of Regional Development, Manufacturing and Water (formerly the Department of ▸ Department of Environment and Science (DES)—Matters of State Environmental Significance ▸ Other GIS information available online, including Queensland Globe and Queensland Spatial Catalogue (QSpatial).
Field survey	A field assessment of the LVIA study area was carried out to ground truth the findings of the desktop assessment and to assess landscape character and visual amenity, including identifying sensitive viewpoints requiring further assessment.
Stakeholder and community consultation inputs	Relevant feedback from preliminary consultation activities undertaken by others (including as part of the social impact assessment, (refer Appendix Q: Social Impact Assessment) has informed the LVIA, where appropriate.
Identification of potential Project impacts	This task included describing infrastructure that is likely to be associated with the Project, such as: ▸ Toowoomba Range Tunnel portals and intermediate tunnel ventilation building ▸ Presence of embankments ▸ Bridges and viaducts ▸ Cuttings ▸ Fencing ▸ Noise barriers. Potential impacts were then considered in the landscape and visual assessments.
Landscape	A landscape assessment was carried out based on an analysis of landscape character, including those landscape features that contribute to the amenity of the area, particularly any landscape values identified in legislation or planning documents during the desktop phase or through community and stakeholder consultation. LCTs have been defined and, where necessary, these have been further subdivided into geographically distinct Landscape Character Areas (LCAs). The landscape impact assessment defined the sensitivity of the landscape as well as the magnitude of change to the landscape. The significance of the potential impacts on the landscape character was then rated based on an evaluation of the sensitivity of the existing landscape to change and the magnitude of change that is likely to occur.

Method	Description
Visibility Assessment Mapping (VAM) study	A viewshed is defined as an area visible from a particular location (and may be modelled or field validated). A VAM study was used and undertaken for the Project based on an analysis of views and viewsheds; particularly any major views or outlooks identified in legislation or planning documents during the desktop phase or through stakeholder and community consultation. Viewpoints and the visual receptor audiences they represent were defined and then rated for their sensitivity. Following this rating, the magnitude of change to views and visual amenity was determined. The magnitude of change is dependent on the nature, scale and duration of the change that is expected. The magnitude of change also depends on the loss, change or addition of any feature in the field of view of the receptor; or any change to the backdrop to, or outlook from, a viewpoint. The significance of the overall potential impacts on visual amenity was then determined based on the sensitivity of existing views to change and the magnitude of change that is likely to occur.
Preparation of	Visualisations have been prepared to represent the potential visual impact of the presence of the Project from a selection of the representative viewpoints. Visualisations are illustrations or photomontages that aim to represent an observer's view of a proposed development.
Lighting assessment	A lighting assessment was carried out based upon an analysis of representative views identified through the visual assessment. Lighting impacts were considered during both construction and operation phases of the Project. The sensitivity of the viewpoints with respect to changes in after-dark lighting conditions were defined based on elements such as proximity of the viewpoint to a lighting source associated with the Project and the accessibility of the viewpoint to viewers at night. The assessment determined the magnitude of change to views and visual amenity due to lighting depends on the nature, scale and duration of the change to lighting that is expected. The magnitude of change also considered any change to the backdrop to, or outlook from, the representative viewpoint. The significance of lighting impact in each representative viewpoint was then made by considering the sensitivity of each representative night-time viewpoint and the magnitude of change that is likely to occur.
Impacts mitigation	Following identification of impacts, consideration was given to how impacts can be mitigated. This included modification of the design (horizontal or vertical alignment and materiality), vegetation screening and, if necessary, liaison with landowners. Proposed mitigation measures listed in Section 10.7.2 were considered in the assessment and further landscape and additional visual mitigation opportunities have been proposed where appropriate.
Residual impact assessment	A residual impact assessment was determined using the same process described above, to reassess the significance level after the proposed mitigation measures were applied. The initial significance levels were compared to the residual significance levels to assess the effectiveness of the proposed mitigation measures. For further details refer Section 10.7.3.

10.4.1 Landscape and visual impact assessment study area

For the purposes of the assessment, the LVIA study area has been defined as the area in Figure 10.1, which consists of a 10 km offset from the centreline of the Project alignment, extending west towards Oakey, south of Westbrook, north of Cabarlah and as far east as Grantham. This is based on:

- Horizontal and vertical alignment of the Project
- VAM, which establishes the theoretical viewshed of the Project based on landform
- Assumptions regarding the likely extent of visibility of projects of this nature. It is considered unlikely that any visual receptors located beyond the boundary of the 10 km LVIA study area will be able to obtain views of the Project. However, the Project connects to the adjacent B2G and H2C Inland Rail projects
- Refinement during the field survey stage.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Cabarlah
New England Hwy
Murphys Creek
Murphys Creek Rd
Highfields
Warrego Hwy
Kingsthorpe
Gowrie Junction
Gowrie
Birnam
Blue Mountain Heights
Ballard
Stevens Rd
Goldmine Rd
Airforce Rd
Gowrie Mountain
Cranley
Toowoomba Byp
Postmans Ridge
Seventeen Mile Rd
Gowrie Junction Rd
Troys Rd
Bridge St
North St
Jones Rd
Prince Henry Heights
Withcott
Helidon Spa
Helidon
Toowoomba Cecil Plains Rd
Torrington
Taylor St
Herries St
Toowoomba Bypass Rd
Postmans Ridge Rd
Warrego Hwy
Wellcamp
Toowoomba
Gatton Helidon Rd
Grantham
Biddeston
Rangeville
Back Flagstone Rd
Flagstone Creek Rd
Westbrook
Toowoomba Athol Rd
Gore Hwy
Ma Ma Creek
Dalveen Connection Rd
Railway St
Mount Sylvia Rd
Ingoldsby Rd
Luck Rd
Wyreema
New England Hwy
LOCKYER VALLEY
Cambooya
Ramsay Rd
Brisbane
Ipswich
Toowoomba
Grandchester
Warwick
Goondiwindi
Narrabri
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10
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20
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INLAND RAIL
ARTC
The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.
GOWRIE TO HELIDON
Figure 10.1: LVIA study area
LEGEND
5 Chainage (km)
Localities
B2G project alignment
G2H project alignment
H2C project alignment
Powerlines (within 2 km of the alignment)
Tunnel
Existing rail
Major roads
Minor roads
LVIA study area (10 km from rail alignment)
Local Government Areas
0 5 10 km
Coordinate System: GDA 1994 MGA Zone 56
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10.4.2 Significance assessment criteria

The significance of a potential impact is assessed in terms of the sensitivity or vulnerability of the environmental aspect, and the magnitude of the potential impact. As previously noted, the LVIA methodology has defined its own thresholds for sensitivity and magnitude based on the principles of, but are different from the criteria defined in Chapter 4: Assessment Methodology and follow criteria more widely used for the assessment of landscape and visual impacts. The following sensitivity criteria (refer Table 10.4), magnitude (refer Table 10.5) and significance criteria (refer Table 10.6) were used to determine potential impacts relating to the LVIA.

10.4.2.1 Sensitivity to change

The sensitivity of a landscape is judged on the extent it can accept change or a particular type and scale without adverse effects on existing landscape character and values. Therefore, assessment of sensitivity is based on the scale and location of the Project and how this relates to the landscape characteristics of the LVIA study area.

Levels of sensitivity vary according to the type of development and the nature of the landscape. Key aspects considered when identifying the level of sensitivity associated with each LCT defined in Table 10.4 include:

- Landscape's inherent values (e.g. perceptual qualities, cultural importance, and any specific values that may apply such as landscape planning designations)
- Landscape's ability to absorb changes associated with the Project (e.g. the extent to which the Project may fit or be absorbed into the landform, land use, pattern, scale or texture of the existing landscape).

Separate definitions are provided for the sensitivity of:

- Landscape
- Viewpoint, and the visual receptor audiences it represents
- Representative viewpoint to changes in after-dark lighting conditions.

TABLE 10.4 DEFINING LANDSCAPE SENSITIVITY

Sensitivity of landscape		Attributes of landscape sensitivity categories
High	Landscape	A landscape protected by national designation (such as a national park) and/or widely acknowledged for its quality and value; a landscape with distinctive character and low capacity to accommodate the type of change envisaged.
	Visual sensitivity	Large numbers of viewers or those with proprietary interest and prolonged viewing opportunities such as residents and users of attractive or well-used recreational facilities. Views from a regionally important location whose interest is specifically focused on the landscape, for example a national park.
	Sensitivity to lighting	Easily accessible at night, with large numbers of viewers or those with proprietary interest and prolonged viewing opportunities located at very close distances (typically less than 200 m) to the light source.
Moderate	Landscape	A moderately valued landscape, perhaps a regionally important landscape or protected by regional or state designation, or where its character, land use, pattern and scale may have some capacity to accommodate a degree of the type of change envisaged.
	Visual sensitivity	Medium numbers of residents (e.g. rural communities and townships) and moderate numbers of visitors with an interest in their environment e.g. visitors to state forests, including bush walkers, horse riders, and trail bikers. Larger numbers of travellers with an interest in their surroundings, for example, local designated scenic routes.
	Sensitivity to lighting	Relatively accessible at night with medium numbers of viewers and close to the site or easily accessible with propriety interest but located some distance (typically up to 500 m) from the light source.

Sensitivity of landscape		Attributes of landscape sensitivity categories
Low	Landscape	A landscape valued to a limited extent, perhaps a locally important landscape or where its character, land use, pattern and scale is likely to have the capacity to accommodate the type of change envisaged.
	Visual sensitivity	Small numbers of visitors with a passing interest in their surroundings or transient views e.g. those travelling along principal roads. Viewers whose interest is not specifically focused on the landscape, for example, workers, commuters, and truck drivers.
	Sensitivity to lighting	Typically, the location not accessed at night, with small numbers of visitors with a passing interest in their surroundings e.g. those travelling along principal roads or greater numbers of viewers, but located at considerable distance from the light source (typically less than 1 km).
Negligible	Landscape	A landscape that is not valued for its scenic quality or where its character, existing land use, pattern and scale are tolerant of the type of change envisaged, and the landscape has capacity to accommodate change.
	Visual sensitivity	Very occasional numbers of viewers with a passing interest in their surroundings, for example, those travelling along minor roads and views from the air.
	Sensitivity to lighting	Rarely accessed at night. Rural locations with very occasional numbers of viewers with a passing interest in their surroundings e.g. those travelling along minor roads and views from the air or located at greater than 1 km from the light source.

10.4.2.2 Magnitude of change

The magnitude of change categories used in this assessment are defined in Table 10.5. Separate definitions are provided for the magnitude of change to:

- Landscape
- Viewpoint, and the visual receptor audiences it represents
- Representative viewpoint to changes in after-dark lighting conditions.

There is no standard methodology for the quantification of the magnitude of effects; however, it is generally based on the scale or degree of change to the landscape or visual resource, the nature of the effect and its duration. The magnitude of change also depends on the loss, change or addition of any feature to the existing landscape and is based on that part of the LCT that is likely to be impacted to the greatest extent by the Project before the application of any mitigation.

TABLE 10.5 DEFINING MAGNITUDE OF CHANGE TO LANDSCAPE CHARACTER

Magnitude of change		Typical examples
High	Landscape	Dominant change: A clearly evident and frequent or continuous change in landscape characteristics affecting an extensive area, which is likely to fundamentally change the character of the landscape.
	Visual	Dominant change: Major changes in view at close distances, affecting a substantial part of the view, continuously visible for a long duration, or obstructing a substantial part or important elements of view. Generally, short distances (typically < 250 m) to the nearest Project infrastructure element.
	Lighting	Dominant change: Occurs when an intrinsically dark landscape becomes brightly lit.
Moderate	Landscape	Considerable change: A considerable change in landscape characteristics, frequent or continuous and over a wide area or a clearly evident change, but over a restricted area.
	Visual	Considerable change: Clearly perceptible changes in views at intermediate distances, resulting in either a distinct new element in a significant part of the view, or a more wide-ranging, less concentrated change across a wider area. Generally, short to medium views (typically 250 m to 1.0 km) to the nearest Project infrastructure.
	Lighting	Considerable change: Occurs when an intrinsically dark landscape becomes predominantly lit or a predominantly dark landscape becomes brightly lit.

Magnitude of change		Typical examples
Low	Landscape	Noticeable change: A noticeable change in landscape characteristics over a wide area or a considerable change over a restricted area but will not fundamentally change the character of the landscape.
	Visual	Noticeable change: Minor changes in views at long distances or visible for a short duration, or are expected to blend in with the existing view to a moderate extent. Generally, medium- to long-distance views (typically 1.0 to 2.5 km to the nearest Project infrastructure).
	Lighting	Noticeable change: Occurs when an intrinsically dark[1] landscape become predominantly dark[2], a predominantly dark landscape becomes predominantly lit[3] or a predominantly lit landscape becomes brightly lit.[4]
Negligible	Landscape	Barely perceptible change: An imperceptible, barely or rarely perceptible change in landscape characteristics.
	Visual	Barely perceptible change: Change that is barely visible at a very long distance or visible for a very short duration, and/or is expected to blend with the existing view. Distant views (generally > 2.5 km to the nearest Project infrastructure.
	Lighting	Barely perceptible change: Occurs when a landscape experiences negligible changes from the existing lighting conditions to the proposed lighting conditions.
No impact	Landscape, visual and lighting	No change in landscape, visual or lighting characteristics.

Table notes:

1. Intrinsically dark—inherently remote rural landscapes with minimal artificial lighting other than localised lighting of a dwelling. Typically, no street lighting and no industrial lighting.
2. Predominantly dark—commonly rural residential landscapes where dwellings are still largely isolated from one another, creating a relatively dark atmosphere with intermittent sources of lighting (such as street lighting). Industrial lighting may occur in predominantly dark landscapes; however, lengthy distances between these sites and residential dwellings result in minimal lighting spill onto private property.
3. Predominantly lit—commonly small towns with standard elements of lighting such as street lighting and lighting from residential dwellings, commercial businesses and some industrial lighting
4. Brightly lit—town or city centres or large-scale industrial landscapes with high levels of lighting.

10.4.2.3 Significance of impact

An evaluation of overall potential effects on landscape character is based on the sensitivity of the existing landscape to change and the magnitude of change that is likely to occur. No prescribed methods for assessment of significance of landscape impacts exist; therefore, professional judgement and experience are applied to identify the level of significance. The overall significance of change to landscape amenity is determined using Table 10.6.

TABLE 10.6 DETERMINING SIGNIFICANCE OF EFFECT ON LANDSCAPE VALUES

Significance of effect		Magnitude of change to landscape amenity			
		High (dominant change)	**Moderate (considerable change)**	**Low (noticeable change)**	**Negligible (barely perceptible change)**
Sensitivity of landscape	**High**	Major	High	Moderate	Low
	Moderate	High	Moderate	Low	Low
	Low	Moderate	Low	Negligible	Negligible
	Negligible	Low	Low	Negligible	Negligible

In instances where there is no magnitude of change and no potential impacts on landscape character are anticipated, a judgement of 'no impact' is recorded.

Table 10.7 describes the classification of significance of impact.

TABLE 10.7 SIGNIFICANCE CLASSIFICATIONS

Significance	Description
Major	Arises when an impact will potentially cause irreversible or widespread harm to an environmental value that is irreplaceable because of its uniqueness or rarity. Avoidance through appropriate design responses is the only effective mitigation.
High	Occurs when the proposed activities are likely to exacerbate threatening processes affecting the intrinsic characteristics and structural elements of the environmental value. While replacement of unavoidable losses is possible, avoidance through appropriate design responses is preferred to preserve its intactness or conservation status.
Moderate	Results in degradation of the environmental value due to the scale of the impact or its susceptibility to further change even though it may be reasonably resilient to change. The abundance of the environmental value ensures it is adequately represented in the region, and that replacement, if required, is achievable.
Low	Occurs where an environmental value is of local importance and temporary or transient changes will not adversely affect its viability provided standard environmental management controls are implemented.
Negligible	Occurs where the proposed activities will have a negligible effect on environmental values. This typically occurs where the activities are located in already disturbed areas and/or where sensitivity to change is low.

10.5 Existing environment

10.5.1 Overview

The Project traverses a broad range of landscapes, from developed urban areas, industrial and waste management precincts, isolated rural settlements, open woodland, pastoral and agricultural landscapes to the undulating and vegetated foothills of the Great Dividing Range. Extensive areas within the LVIA study area have been cleared for agricultural purposes and for the development of residential communities. These areas include typical infrastructure such as roads, rail, powerlines, landfills, water treatment plants and pipelines.

An overview of the existing environment of the LVIA study area follows, with further detail of the existing environment relevant to the LVIA study area is provided in Appendix H: Landscape and Visual Impact Assessment. More detailed descriptions of the landscape and environment aspect relevant the Project disturbance footprint are provided in the relevant chapters of the EIS.

10.5.2 Regional landscape context

The LVIA study area is located near Toowoomba and includes areas within Toowoomba and Lockyer Valley LGAs. In the western extent of the LVIA study area, the Project passes through rural and grazing lands and is in tunnel under the Toowoomba Plateau, passing under the localities of Cranley, Mount Kynoch, and Ballard and emerging on the eastern side of the Toowoomba Range near Mt Kynoch, before continuing through areas of native vegetation and grazing properties of the Lockyer Valley. Within the LVIA study area, large areas of land have been cleared for pasture, agricultural production and for rural and urban residential settlements. Tracts of remnant vegetation are also present, limited to the steep, hilly landscapes of Lockyer National Park and the Great Dividing Range. The undulating uplands of these ranges are a dominant feature in the landscape that separates the fertile arable floodplains of the Lockyer Valley from the Toowoomba Plateau. The Project and its wider landscape context is presented in Figure 10.1.

10.5.2.1 Settlement and infrastructure

The presence of a settlement indicates locations where there are likely to be concentrations of people who may be interested in views and visual amenity.

The largest settlement in the LVIA study area is the regional city of Toowoomba, situated on an escarpment on the western side of the Great Dividing Range, approximately 700 m above sea level and 130 km west of Brisbane with a population of 160,779 (Australian Bureau of Statistics (ABS), 2016a). The suburbs of Harlaxton, Cotswold Hills and Wilsonton Heights are all considered part of Toowoomba along with the adjacent suburbs of Cranley (population of 1,446) and Mount Kynoch (population of 237).

Highfields, situated to the north of Toowoomba is both a town and a suburb, serving as a satellite suburb of the city of Toowoomba. Highfields and the surrounding residential areas, including the suburb of Blue Mountain Heights, have an estimated urban population of 929 (ABS, 2016a). Kingsthorpe and Gowrie are rural residential localities that are situated in close proximity to the Project, situated 17 km and 10 km north-west of Toowoomba respectively, with populations of 1,872 and 2,120 respectively (ABS, 2016a). There is also new development occurring within the region and LVIA study area, including the Mount Lofty master planned residential community that will have potential views of the Project.

Similar rural settlements and localities within the LVIA study area include Gowrie Mountain, Murphys Creek, Withcott and Helidon, which have populations of 224, 221, 1,844 and 1,059 respectively (ABS, 2016). There are also several areas of acreage estates and emerging residential communities within the vicinity of the Project.

There are five major roads within the LVIA study area, including the Warrego Highway (A2), New England Highway (A3), the Gore Highway (A39), Toowoomba Connection Road (A21) and Toowoomba-Athol Road (A139). The Toowoomba Bypass is comprised of the Warrego Highway, from Helidon Spa to Charlton and the Gore Highway from Charlton to Athol (DTMR, 2019c) and was opened in September 2019 and will become a main road through the region with anticipated Annual Average Daily Traffic (AADT) up to 2,900 (DTMR, 2019c).

Other key roads include the following:

- Roads in the Toowoomba LGA Toowoomba-Cecil Plains Road, Troys Road, Carrington Road, Gowrie Junction Road, Boundary Street, Goombungee Road
- Roads in the Locker LGA Murphys Creek Road, Jones Road, Gittins Road, McNamaras Road, Postmans Ridge Road, Airforce Road and Gatton-Helidon Road.

Some of these roads are part of the four significant signposted tourist routes within the LVIA study area. The 'Warrego Way', 'Adventure Way' and 'Australia's Country Way' are nationally marketed 'Great Queensland Drives' (Outback Queensland Tourist Association, 2015). 'Warrego Way' and 'Adventure Way' both follow the Warrego Highway, while 'Australia's Country Way' follows the New England Highway.

At the regional level the 'Cobb and Co Tourist Drive' is a well-known and signposted route that stops at several staging posts with informative tourist signage and infrastructure. Other local self-drives that appear in tourist literature but that are not signposted comprise the 'Glen Rock Tourist Drive', Open Plains Country Drive', 'Spring Bluff Tourist Drive', 'Farmers Country Drive', 'Great Bunya Drive', 'High Country Drive' and 'Steele Rudd Country Drive'.

Views from these drives have been considered and are incorporated into the relevant viewpoint assessments. In addition, views from a range of other local and State-controlled roads have been considered, particularly where these are located close to the Project.

The West Moreton System is an existing operational freight and passenger rail corridor located within the LVIA study area, connecting rail services from Brisbane to the west and south-west of the State and providing an important connection to the Darling Downs. The rail corridor supports the twice weekly 'Westlander' passenger service between Brisbane to Charleville (Australian Rail Maps, 2018). The passenger service departs Brisbane on Tuesdays and Thursdays at 7.15 pm and departs Charleville on Wednesdays and Fridays at 6.15 pm, with trains passing through the LVIA study area late on Tuesday and Thursday evenings, and early on Thursday and Saturday mornings.

The South Western System branches from the West Moreton System rail corridor at Toowoomba and proceeds south through Warwick and Stanthorpe to the NSW border at Wallangarra.

10.5.2.2 Geology, landform and hydrology

The geology underlying the LVIA study area is largely volcanic in origin with large areas of sedimentary deposits and falls within the Lockyer Creek drainage sub-basin, a sub-basin of the Brisbane River Basin. Much of the catchment is underlain by sandstone formations, and the area is characterised by cultivated alluvial plains surrounded by flat to gently undulating lowlands that give way to densely vegetated hilly to sub-mountainous basaltic uplands ranges on igneous, metamorphic, and sedimentary rocks (Department of Environment and Heritage Protection, 2016). Within Lockyer National Park there are small areas of impermeable rocks and isolated patches of basalt, providing sandstone ridges and sandy soils. Elevated areas of Lockyer National Park are steep and rugged with gorges, exposed cliff lines and waterfalls in the foothills of the Great Dividing Range (DES, formerly the Department of National Parks, Recreation, Sport and Racing (DNPRSR), 2013). Other local peaks include Mt Tabletop, Mt Davidson, Katoomba Point, Mt Kynoch, Ben Lomond Mountain, Wards Hill, Stringybark Mountain and Evans Hill.

The most notable landscape features within the LVIA study area are the mountainous regions of the Great Dividing Range, and the dramatic vertical face of the Great Escarpment. Both geological features are evident along the east coast of Australia, however Toowoomba is one of the few exceptions where both features are coinciding (QR 2008).

The Toowoomba region falls within the Balonne-Condamine drainage basin and Condamine River drainage sub-basin, one of the largest catchments of the Murray-Darling Basin and is drained by Gowrie Creek and its tributaries, East Creek, West Creek and Black Gully. Other creeks within the Condamine river drainage sub-basin include Westbrook Creek, Dry Creek, Spring Creek and Meringandan Creek.

10.5.2.3 Soils, vegetation and rural land use

Existing land use within and adjacent to the LVIA study area is largely characterised by rural activities on a variety of allotment sizes, in particular grazing, dryland cropping, irrigated horticulture and production forestry. Toowoomba is a regional city and the largest urban settlement of the Darling Downs (TRC, 2017c). A diverse range of other land uses are found in the area including rural properties, urban development, industrial areas and more localised specialist land uses such as vineyards, explosives storage and production, commercial sandstone mining, poultry farms, golf courses, wastewater treatment and waste management facilities. Extractive industries, logistics and transport are major growth areas for Toowoomba's economy (TRC, 2017a). This is evident by the recent expansion of the runway at Toowoomba Wellcamp Airport, Charlton Logistics Park and Witmack Industrial Park (both part of the Toowoomba Enterprise Hub), proposals for construction of the InterLinkSQ – Global Logistics Centre, and for the expansion of the New Acland Coal Mine.

The Darling Downs and low-lying areas of the Lockyer Valley are renowned for their fertile soils and productive agricultural landscapes. The most productive soils within these valleys are the black alluvial clays, typically found on flat, slightly sloping and undulating land along watercourses in low-lying flood prone areas, which support irrigated agricultural production (SEQ Catchments, 2009).

These productive landscapes are surrounded by dryland cropping and cattle grazing, predominately beef cattle, on poorer elevated land and the gently undulating foothills of the surrounding mountain ranges. These ranges are characterised by densely-vegetated, undulating to mountainous areas (including reserves and national parks), on siliceous sands, sandstones and basalts.

Within both the Lockyer Valley and Darling Downs low lying fertile floodplains have been extensively cleared for agricultural production. Extensive clearing has also taken place to facilitate urban development and industrial land uses.

Within the Lockyer Valley, undulating landscapes and foothills are dominated by open eucalypt forests on sedimentary rocks, typically comprised of Brown bloodwood (*Corymbia trachyphloia subsp. trachyphloia*), Lemon-scented gum (*C. citriodora subsp. variegata*), Narrow-leaved ironbark (*Eucalyptus crebra*), Red ironbark (*E. fibrosa subsp. fibrosa).* Within elevated parts of the Great Dividing Range, there are remnant pockets of Narrow-leaved ironbark woodland, which contains Narrow-leaved ironbark (*E. crebra*), Forest red gum (*E. tereticornis*), Moreton Bay ash (*C. tessellaris*), Smooth-barked apple (*Angophora* spp.), and Silver-leaved ironbark (*E. melanophloia*) (DES, 2019c).

Within the elevated landscapes of the Great Dividing Range are Lockyer National Park and Lockyer State Forest, situated to the north of the Project. The Lockyer National Park (11,079 hectares (ha)) is situated approximately 5.3 km to the north of the Project and is comprised of the Lockyer National Park (2,677 ha) and Lockyer National Park (Recovery) (7,790 ha), and is adjacent to the Lockyer Resource Reserve (612 ha) and Lockyer State Forest (818 ha), which are situated approximately 2.3 km and 3 km from the Project respectively. Lockyer National Park and Lockyer National Park (Recovery) were gazetted as national parks in 2008 in recognition of the important biodiversity and conservation values of the area (DNPRSR, 2013). The LVIA study area also includes Alice Creek Nature Refuge (310 ha), which provides fauna links between the various sections of Lockyer National Park. These national parks and nature refuge areas are all located within elevated, vegetated areas, which are considered to have high scenic amenity value. There are several large parks within Toowoomba, within the Great Dividing Range that are also considered to have high scenic amenity value and offer great and easily accessible vantage points.

10.5.2.4 South East Queensland Regional Plan regional landscape values

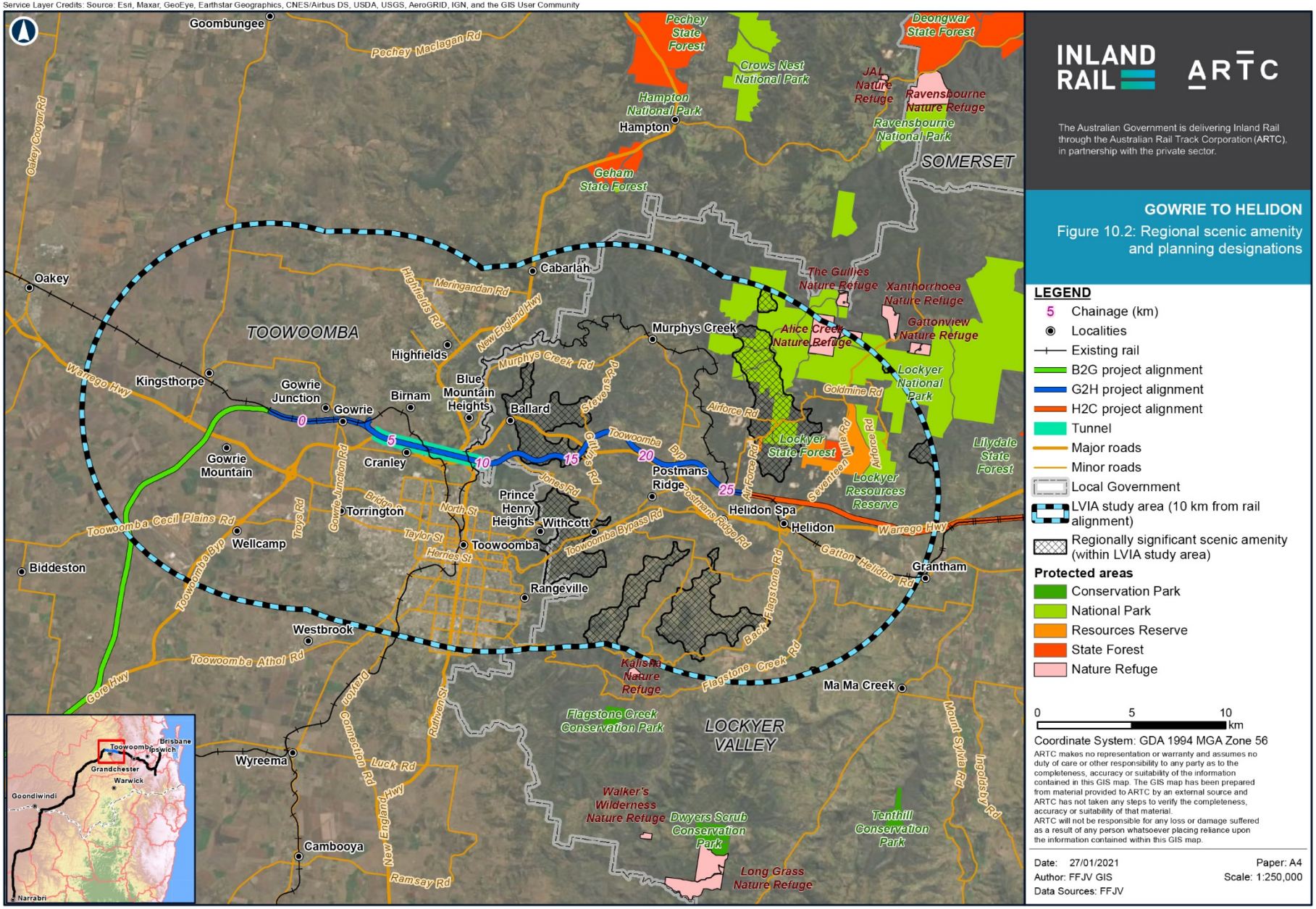
ShapingSEQ includes mapping of areas of 'regionally significant scenic amenity' on 'Map 5c Sustain—regional landscape values'. This is based on the SEQ regional amenity methodology identified in the SEQRP *Implementation Guideline No 8—Identifying and protecting scenic amenity values* (DILGP, 2007).

Figure 10.2 shows the following key areas within and around the LVIA study area that are identified as being regionally significant based on the assessment presented in Appendix H: Landscape and Visual Impact Assessment:

- Escarpment and Foot Hills of the Great Dividing Range at Toowoomba, including landscapes associated with:
  - Ben Lomond in the vicinity of Ballard, Murphys Creek and Withcott
  - Katoomba Point, in the vicinity of Prince Henry Heights, Redwood and Withcott
  - Mt Davidson (Sugarloaf), in the vicinity of Blanchview, Derrymore and Silver Ridge
  - Stringybark Mountain, in the vicinity of Derrymore, Flagstone Creek and Iredale
  - Lockyer National Park and adjacent vegetated areas, within the vicinity of Helidon, White Mountain and Grantham
- The isolated mesas, hills and mountains across the central plains and the north eastern ranges which includes Gowrie Mountain and elevated landscapes near Kingsthorpe and Highfields, including areas associated with the Toowoomba Escarpment
- Parts of the Great Dividing Range from Glen Rock to the vicinity of Toowoomba
- Parts of Helidon Hills near gorges and peaks.

10.5.3 Landscape character assessment

The identified Landscape Character Types (LCTs) and Landscape Character Areas (LCAs) located within the LVIA study area are presented in Figure 10.3 and summarised in Table 10.8.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INLAND RAIL
ARTC
The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.
GOWRIE TO HELIDON
Figure 10.2: Regional scenic amenity and planning designations
LEGEND
5 Chainage (km)
Localities
Existing rail
B2G project alignment
G2H project alignment
H2C project alignment
Tunnel
Major roads
Minor roads
Local Government
LVIA study area (10 km from rail alignment)
Regionally significant scenic amenity (within LVIA study area)
Protected areas
Conservation Park
National Park
Resources Reserve
State Forest
Nature Refuge
0 5 10 km
Coordinate System: GDA 1994 MGA Zone 56
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Scale: 1:250,000
Data Sources: FFJV
Goombungee
Pechey Maclagan Rd
Pechey State Forest
Deongwar State Forest
Crows Nest National Park
JAL Nature Refuge
Ravensbourne Nature Refuge
Ravensbourne National Park
Hampton National Park
Hampton
SOMERSET
Geham State Forest
Oakey Cooyar Rd
Oakey
Cabarlah
Meringandan Rd
Highfields Rd
New England Hwy
TOOWOOMBA
Highfields
Murphys Creek
The Gullies Nature Refuge
Xanthorrhoea Nature Refuge
Alice Creek Nature Refuge
Gattonview Nature Refuge
Lockyer National Park
Murphys Creek Rd
Warrego Hwy
Kingsthorpe
Gowrie Junction
Gowrie
Birnam
Blue Mountain Heights
Ballard
Stevens Rd
Goldmine Rd
Airforce Rd
Lockyer State Forest
Lilydale State Forest
Gowrie Mountain
Cranley
Gowrie Junction Rd
Toowoomba Byp
Postmans Ridge
Seventeen Mile Rd
Lockyer Resources Reserve
Jones Rd
Prince Henry Heights
Withcott
Torrington
Bridge St
North St
Helidon Spa
Helidon
Toowoomba Cecil Plains Rd
Wellcamp
Trevs Rd
Taylor St
Toowoomba
Herries St
Toowoomba Bypass Rd
Postmans Ridge Rd
Gatton Helidon Rd
Grantham
Biddeston
Toowoomba Byp
Rangeville
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Westbrook
Toowoomba Athol Rd
Kalisha Nature Refuge
Flagstone Creek Rd
Ma Ma Creek
Gore Hwy
Flagstone Creek Conservation Park
LOCKYER VALLEY
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Wyreema
Luck Rd
Mount Sylvia Rd
Ingoldsby Rd
Walker's Wilderness Nature Refuge
Dwyers Scrub Conservation Park
Tenthill Conservation Park
New England Hwy
Cambooya
Ramsey Rd
Long Grass Nature Refuge
Brisbane
Ipswich
Toowoomba
Grandchester
Warwick
Goondiwindi
Narrabri
Map by: GN / CB / DTH / FC Z:\GIS\GIS_General\Tasks\Environment\390-ELE-201808061159_LVIA\G2H\390-ELE-201808061159_ARTC_Fig10.2_RSA_v10.mxd Date: 28/01/2021 08:49

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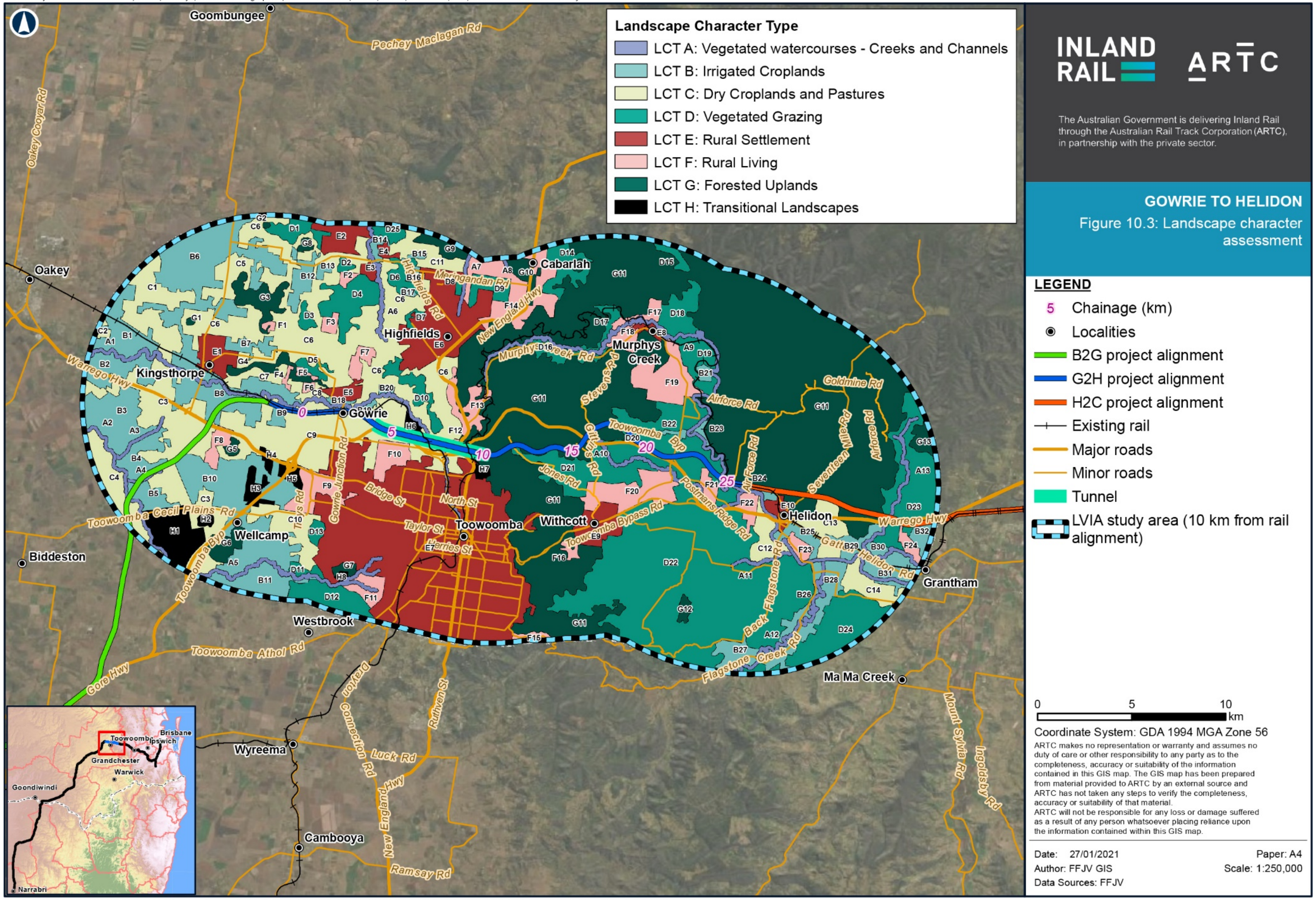

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TABLE 10.8 LANDSCAPE CHARACTER TYPES AND ASSOCIATED LANDSCAPE CHARACTER AREAS

LCT	Associated LCAs
LCT A: Vegetated Watercourses—Creeks and Channels	▸ Gowrie Creek Vegetated Watercourse (LCA A1) ▸ Westbrook Creek Vegetated Watercourse (LCA A2) ▸ Upper Westbrook Creek Vegetated Watercourse (LCA A3) ▸ Dry Creek Vegetated Watercourse (LCA A4) ▸ Spring Creek Vegetated Watercourse (LCA A5) ▸ Meringandan Creek Vegetated Watercourse (LCA A6) ▸ Klein Creek Vegetated Watercourse (LCA A7) ▸ Reedy Creek Vegetated Watercourse (LCA A8) ▸ Lockyer Creek Vegetated Watercourse (LCA A9) ▸ Six Mile Creek Vegetated Watercourse (LCA A10) ▸ Soda Spring Creek Vegetated Watercourse (LCA A11) ▸ Flagstone Creek Vegetated Watercourse (LCA A12) ▸ Sandy Creek Vegetated Watercourse (LCA A13)
LCT B: Irrigated Croplands	▸ Oakey North Irrigated Croplands (LCA B1) ▸ Oakey South Irrigated Croplands (LCA B2) ▸ Westbrook Creek Irrigated Croplands (LCA B3) ▸ Brimblecombe Road Irrigated Croplands (LCA B4) ▸ Wellcamp Airport Irrigated Croplands (LCA B5) ▸ Yalungur Irrigated Croplands (LCA B6) ▸ Glencoe Irrigated Croplands (LCA B7) ▸ Kingsthorpe Irrigated Croplands (LCA B8) ▸ Charlton Irrigated Croplands (LCA B9) ▸ Westbrook Irrigated Croplands (LCA B10) ▸ Wellcamp Irrigated Croplands (LCA B11) ▸ Lilydale West Irrigated Croplands (LCA B12) ▸ Lilydale East Irrigated Croplands (LCA B13) ▸ Meringandan Irrigated Croplands (LCA B14) ▸ Klein Road Irrigated Croplands (LCA B15) ▸ Highfields Road Irrigated Croplands (LCA B16) ▸ Highfields Irrigated Croplands (LCA B17) ▸ Gowrie Irrigated Croplands (LCA B18) ▸ Morris Road Irrigated Croplands (LCA B19) ▸ Birnam Irrigated Croplands (LCA B20) ▸ Upper Lockyer Irrigated Croplands (LCA B21) ▸ Murphys Creek Road Irrigated Croplands (LCA B22) ▸ Lockyer Irrigated Croplands (LCA B23) ▸ Airforce Road Irrigated Croplands (LCA B24) ▸ Helidon Irrigated Croplands (LCA B25) ▸ Flagstone Creek West Irrigated Croplands (LCA B26) ▸ Flagstone Creek Irrigated Croplands (LCA B27) ▸ Flagstone Creek East Irrigated Croplands (LCA B28) ▸ Grantham North Irrigated Croplands (LCA B29) ▸ Sandy Creek Road Irrigated Croplands (LCA B30) ▸ Grantham South Irrigated Croplands (LCA B31) ▸ McLucas Road Irrigated Croplands (LCA B32)

LCT	Associated LCAs
LCT C: Dry Croplands and Pastures	▸ Kings Siding Dry Croplands and Pastures (LCA C1) ▸ Oakey Dry Croplands and Pastures (LCA C2) ▸ Gowrie Mountain Dry Croplands and Pastures (LCA C3) ▸ Biddeston Dry Croplands and Pastures (LCA C4) ▸ Gowrie Little Plain Dry Croplands and Pastures (LCA C5) ▸ Glencoe Dry Croplands and Pastures (LCA C6) ▸ Mt Kingsthorpe Dry Croplands and Pastures (LCA C7) ▸ Gowrie Dry Croplands and Pastures (LCA C8) ▸ Charlton Dry Croplands and Pastures (LCA C9) ▸ Wellcamp Dry Croplands and Pastures (LCA C10) ▸ Klein Road Dry Croplands and Pastures (LCA C11) ▸ Black Flagstone Road Dry Croplands and Pastures (LCA C12) ▸ Helidon Croplands and Pastures (LCA C13) ▸ Verdilla Dry Croplands and Pastures (LCA C14)
LCT D: Vegetated Grazing	▸ Meringandan West Vegetated Grazing (LCA D1) ▸ Meringandan Vegetated Grazing (LCA D2) ▸ Glencoe West Vegetated Grazing (LCA D3) ▸ Glencoe East Vegetated Grazing (LCA D4) ▸ Gowrie Vegetated Grazing (LCA D5) ▸ Highfields Road Vegetated Grazing (LCA D6) ▸ Highfields Vegetated Grazing (LCA D7) ▸ Kleinton Road Vegetated Grazing (LCA D8) ▸ Cabarlah Park Road Vegetated Grazing (LCA D9) ▸ Birnam Vegetated Grazing (LCA D10) ▸ Wellcamp Vegetated Grazing (LCA D11) ▸ Westbrook Vegetated Grazing (LCA D12) ▸ Glenvale Vegetated Grazing (LCA D13) ▸ Cabarlah Vegetated Grazing (LCA D14) ▸ Fifteen Mile Vegetated Grazing (LCA D15) ▸ Murphys Creek South Vegetated Grazing (LCA D16) ▸ Murphys Creek North Vegetated Grazing (LCA D17) ▸ Murphys Creek Vegetated Grazing (LCA D18) ▸ Upper Lockyer Vegetated Grazing (LCA D19) ▸ Postmans Ridge Vegetated Grazing (LCA D20) ▸ Withcott Vegetated Grazing (LCA D21) ▸ Derrymore Vegetated Grazing (LCA D22) ▸ Gatton Vegetated Grazing (LCA D23) ▸ Lilydale Vegetated Grazing (LCA D24) ▸ Volp Road Vegetated Grazing (LCA D25)
LCT E: Rural Settlement	▸ Kingsthorpe (LCA E1) ▸ Meringandan West (LCA E2) ▸ Meringandan (LCA E3) ▸ Meringandan South (LCA E4) ▸ Gowrie (LCA E5) ▸ Highfields (LCA E6) ▸ Toowoomba (LCA E7) ▸ Murphys Creek (LCA E8) ▸ Withcott (LCA E9) ▸ Helidon (LCA E10)

LCT	Associated LCAs
LCT F: Rural Living	▸ Westview Rural Living (LCA F1) ▸ Meringandan West Rural Living (LCA F2) ▸ Glencoe Rural Living (LCA F3) ▸ Redlands Drive Rural Living (LCA F4) ▸ Hilltop Drive Rural Living (LCA F5) ▸ Gowrie Rural Living (LCA F6) ▸ Highfield Ridge Rural Living (LCA F7) ▸ Gowrie Mountain Rural Living (LCA F8) ▸ Torrington Rural Living (LCA F9) ▸ Cranley Rural Living (LCA F10) ▸ Glenvale Rural Living (LCA F11) ▸ Weale Street Rural Living (LCA F12) ▸ Blue Mountain Heights Rural Living (LCA F13) ▸ Cabarlah Rural Living (LCA F14) ▸ Silver Ridge Rural Living (LCA F15) ▸ Withcott South Rural Living (LCA F16) ▸ Murphys Creek North Rural Living (LCA F17) ▸ Murphys Creek South Rural Living (LCA F18) ▸ Upper Lockyer Rural Living (LCA F19) ▸ Withcott Rural Living (LCA F20) ▸ Postmans Ridge Rural Living (LCA F21) ▸ Helidon Spa Rural Living (LCA F22) ▸ Helidon Rural Living (LCA F23) ▸ Grantham Rural Living (LCA F24)
LCT G: Forested Uplands	▸ Mt Davidson (Sugarloaf) Forested Uplands (LCA G1) ▸ McGregor Mountain Forested Uplands (LCA G2) ▸ Storey Mountain Forested Uplands (LCA G3) ▸ Mt Kingsthorpe Forested Uplands (LCA G4) ▸ Gowrie Mountain Forested Uplands (LCA G5) ▸ Wellcamp Forested Uplands (LCA G6) ▸ Glenvale Mountain Forested Uplands (LCA G7) ▸ Meringandan West Forested Uplands (LCA G8) ▸ Kleinton Forested Uplands (LCA G9) ▸ Cabarlah Forested Uplands (LCA G10) ▸ Great Dividing Range Forested Uplands (LCA G11) ▸ Stringybark Mountain Forested Uplands (LCA G12) ▸ Lockyer National Park Forested Uplands (LCA G13)
LCT H: Transitional Landscapes	▸ Wellcamp Airport (LCA H1) ▸ Boral Quarry (LCA H2) ▸ Toowoomba Waste Management Facility (LCA H3) ▸ Charlton Industrial Precinct (LCA H4) ▸ Charlton Raceway (LCA H5) ▸ Wetalla Wastewater Treatment Plant (LCA H6) ▸ Harlaxton Quarry (LCA H7) ▸ Glenvale Quarry (LCA H8)

10.5.4 Visual assessment

10.5.4.1 Visual audiences and receptors

A series of viewpoints were selected to provide a representative assessment of the potential landscape and visual impacts of the Project on a range of visual audiences and landscape settings at a range of distances from the Project within the LVIA study area, including, but not limited to, the views experienced by the following:

- Local residents and workers in towns and rural settlements (including Kingsthorpe, Gowrie Junction, Gowrie Mountain, Highfields, Blue Mountain Heights, Toowoomba, Withcott, Postmans Ridge, Helidon Spa and Helidon)
- Local residents and workers on rural and acreage properties
- Travellers on main and local roads
- Tourists on roads including users of 'scenic drives' and staying in tourist accommodation within the LVIA study area
- Passengers on the 'Westlander' train
- Recreational users of the landscape, particularly using walking trails along the Great Dividing Range within the national parks, state forests, public parks, and other nature reserves.

The selected viewpoints are presented in Table 10.9 and shown in Figure 10.4. These are discussed further in Appendix H: Landscape and Visual Impact Assessment.

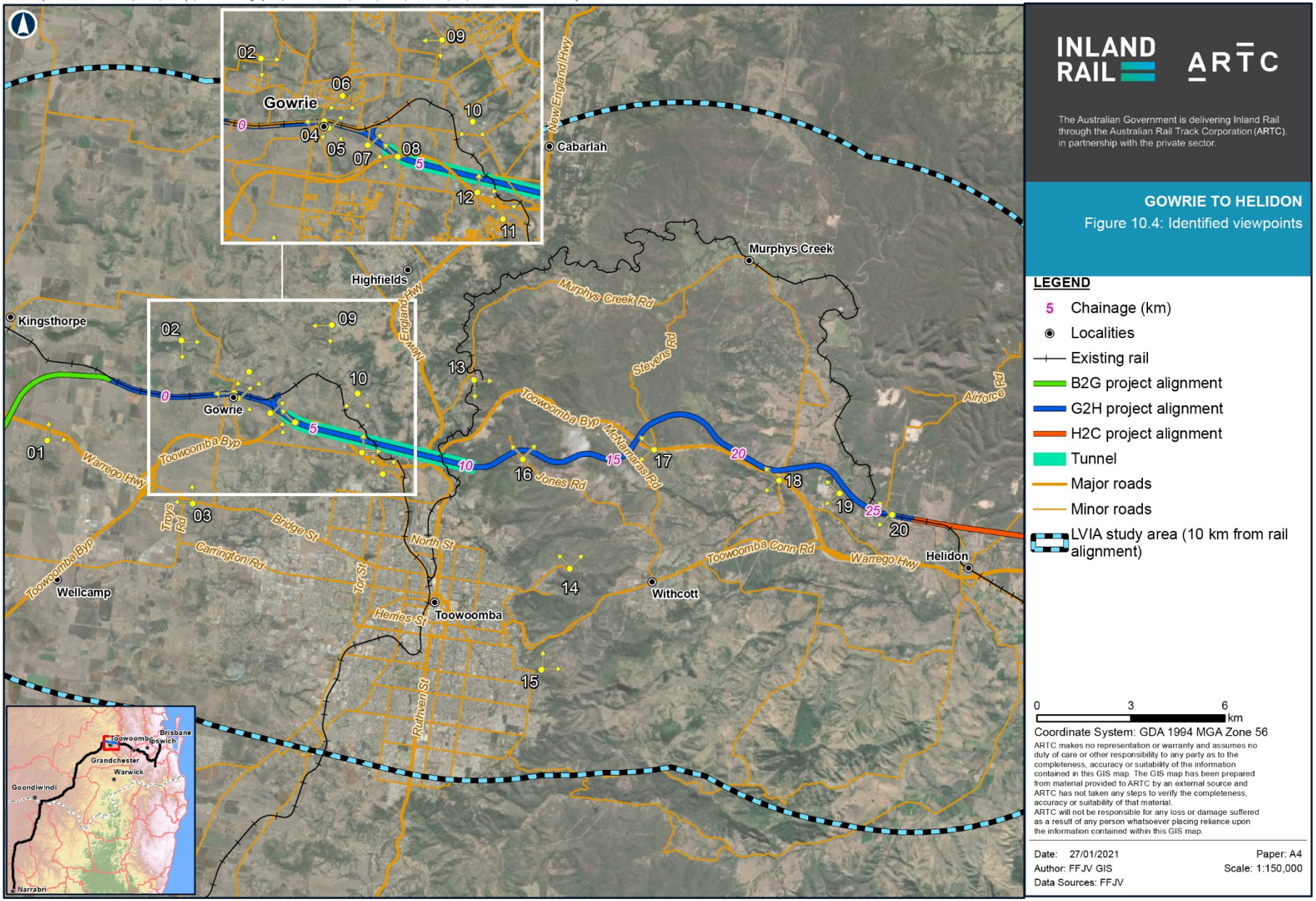
For the purposes of this assessment, visualisations have been prepared for some of the viewpoints outlined in Table 10.9 to represent the potential visual impact of the presence of the Project. Visualisations have not been prepared for all viewpoints, and instead have been selected on the basis of those illustrating key infrastructure elements likely to be of interest to the community or the most sensitive viewpoints, such as from regionally significant scenic lookouts.

TABLE 10.9 VIEWPOINT SELECTION

Viewpoint name	Anticipated approximate distance to Project	Key visual receptors
Viewpoint 1: Lenora Court, Gowrie Mountain, looking north-east	Rail alignment of B2G is approximately 2.2 km north of this viewpoint. G2H Project is 2.8 km to the north-east at closest point	Represents typical and accessible elevated views of residents of Gowrie Mountain
Viewpoint 2: Hilltop Drive Park, Gowrie, looking south-east towards Toowoomba	Rail alignment is approximately 1.8 km to the south of this viewpoint	Represents typical and accessible elevated views of those visiting Hilltop Drive Park and of nearby residents of Hilltop Drive and Koala Drive
Viewpoint 3: Charlton Pinch Road, Torrington, looking north-west over the Warrego Highway	Rail alignment is approximately 3.4 km to the north of this viewpoint	Represents typical and accessible views of residents of Torrington, Charlton and Cotswold Hills, and of visitors, workers and tourists travelling along the Warrego Highway
Viewpoint 4: Near 10 Paulsens Road, Gowrie, looking south-west towards Gowrie Junction Road bridge	Rail alignment is approximately 30 m to the south of this viewpoint, while the Gowrie Junction Road bridge is approximately 220 m to the west of this viewpoint	Represents typical and accessible views of residents of Paulsens Road and communicates impacts on nearby residential properties situated on Morris Road, McMahon Road, Junction Street and Krienke Road
Viewpoint 5: Near 14 Junction Street, Gowrie, looking east towards western tunnel portal	Rail alignment is approximately 150 m to the north of this viewpoint	Represents typical and accessible elevated views of residents of Junction Street and nearby isolated rural residential properties
Viewpoint 6: Near 13–18 Treeline Drive, Gowrie, looking south	Rail alignment is approximately 780 m to the south of this viewpoint	Represents typical and accessible elevated views of visitors and residents travelling along Treeline Drive and nearby residents of Gowrie

Viewpoint name	Anticipated approximate distance to Project	Key visual receptors
Viewpoint 7: 541–549 Ganzer Morris Road, looking east towards western tunnel portal	Rail alignment is approximately 200 m to the north-east of this viewpoint	Represents typical and accessible views of isolated rural residents of Gowrie and of visitors, workers and tourists travelling along Ganzer Morris Road
Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass	Viewpoint is directly over the top of the tunnelled rail alignment. Western tunnel portal is approximately 320 m to the north-west of this viewpoint	Represents typical and accessible views of nearby isolated rural residents and of visitors, workers and tourists travelling along Boundary Street and the Toowoomba Bypass
Viewpoint 9: Phoenix Street, Highfields looking south-west	Rail alignment and western tunnel portal are approximately 2.8 km to the south-west of this viewpoint	Represents typical and accessible elevated views of visitors and residents of Highfields, particularly those situated on Phoenix Street, Federation Drive and Wedgetail Drive. Also representative of views from the nearby Highfield Ridge estate
Viewpoint 10: Old Goombungee Road, Birnam looking south towards Toowoomba	Rail alignment (tunnelled) is approximately 1.4 km to the south-west of this viewpoint. Toowoomba Range tunnel intermediate ventilation shaft location and associated buildings is approximately 1.4 km to the south-south-east of this viewpoint, in the vicinity of the existing industrial buildings on Hermitage Road	Represents typical and accessible views of nearby isolated rural residents and of visitors, workers and tourists travelling along Old Goombungee Road.
Viewpoint 11: Looking north from Baillie Henderson Hospital, Cranley	Rail alignment (tunnelled) is approximately 890 m to the north-east of this viewpoint, while the Toowoomba Range tunnel intermediate ventilation shaft location and associated infrastructure is approximately 1 km to the north-west of this viewpoint	Represents typical and accessible views of visitors, staff and patients of the Baillie Henderson Hospital
Viewpoint 12: Looking north-east from Hermitage Road, Cranley	Rail alignment (tunnelled) is approximately 350 m to the north of this viewpoint, while the Toowoomba Range tunnel intermediate ventilation shaft location and associated infrastructure is approximately 385 m to the north-east of this viewpoint	Represents typical and accessible views of nearby workers in industrial buildings, people accessing the Toowoomba Waste Management Centre along Hermitage Road and is also considered representative of possible views from Toowoomba Bypass
Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights	Rail alignment is approximately 2.6 km to the south-east of this viewpoint, while the eastern tunnel portal is approximately 2.7 km to the south of this viewpoint	Represents typical and accessible elevated views of visitors and residents of Blue Mountain Heights, particularly those situated on Keira Court. Also representative of views from the New England Highway rest area and from private residential properties situated on Murphys Creek Road, Rangeview Road, Skyline Drive, Sirron Street, Buena Vista Crescent, Hilltop Crescent and Rosewall Court
Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights	Rail alignment is approximately 3.4 km to the north of this viewpoint	Represents typical and accessible views of visitors and tourists visiting Katoomba Point Lookout, a scenic viewpoint with picnic facilities. Also representative of views possible from Jubilee Park, Mt Tabletop and from private elevated residential properties in Prince Henry Heights, Mount Lofty, and Harlaxton

Viewpoint name	Anticipated approximate distance to Project	Key visual receptors
Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville	Rail alignment is approximately 6.5 km to the north of this viewpoint	Represents typical and accessible views of visitors and tourists visiting Picnic Point Parklands a regionally-important scenic viewpoint with picnic and other recreation facilities. Also representative of views possible from Mt Tabletop and from private elevated residential properties in East Toowoomba and Rangeville
Viewpoint 16: Near 102–114 Jones Road, Ballard, looking north	Rail alignment is approximately 280 m north of this viewpoint	Represents typical and accessible views of isolated rural residents and of those travelling along Jones Road
Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west	Rail alignment is approximately 620 m north-west of this viewpoint	Represents typical and accessible views of residents of those travelling along the Toowoomba Bypass (Warrego Highway). Also representative of similar views likely to be obtained by recreational users of the Bicentennial National Trail, which follows Gittins Road in this location and is also directly impacted by the Toowoomba Bypass and Toowoomba Second Range Crossing (TSRC) and Six Mile Creek viaduct, where it crosses Gittins Road approximately 780 m north of this viewpoint
Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north	Rail alignment is approximately 330 m north of this viewpoint	Represents typical and accessible views of residents of those travelling along Murphys Creek Road. Also representative of views possible from Toowoomba Bypass
Viewpoint 19: Near 730–737 Ashlands Drive, Helidon Spa, looking north	Rail alignment is approximately 225 m north-east of this viewpoint	Represents typical and accessible views of visitors and residents of Ashlands Drive
Viewpoint 20: Airforce Road, Helidon, looking west	Rail alignment is approximately 6 m south of this viewpoint, while the Lockyer Creek viaduct is approximately 685 m to the west of this viewpoint	Represents typical and accessible views of those travelling along Airforce Road, including workers and visitors and residents of nearby isolated rural residential properties


Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
INLAND RAIL
ARTC
The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.
GOWRIE TO HELIDON
Figure 10.4: Identified viewpoints
LEGEND
5 Chainage (km)
Localities
Existing rail
B2G project alignment
G2H project alignment
H2C project alignment
Tunnel
Major roads
Minor roads
LVIA study area (10 km from rail alignment)
Gowrie
Cabarlah
Highfields
Murphys Creek
Kingsthorpe
Wellcamp
Toowoomba
Withcott
Helidon
New England Hwy
Murphys Creek Rd
Stevens Rd
Airforce Rd
Toowoomba Byp
McNamaras Rd
Jones Rd
Warrego Hwy
Toys Rd
Bridge St
Carrington Rd
North St
Tor St
Herries St
Ruthven St
Toowoomba Conn Rd
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Grandchester
Warwick
Goondiwindi
Narrabri
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10.6 Potential impacts

The following sections provide a summary of the potential landscape and visual amenity impacts that are associated with the Project. Appendix H: Landscape and Visual Impact Assessment provides further details.

10.6.1 Project phases

10.6.1.1 Construction phase

Table 10.10 describes the construction activities that will create a potential impact during the construction phase and provides example indicative imagery for each activity or infrastructure type.

TABLE 10.10 POTENTIAL LANDSCAPE AND VISUAL IMPACTS DURING CONSTRUCTION PHASE

Construction activities and infrastructure	Indicative imagery
Vegetation clearing and associated earthworks Much of the landscape is already cleared for agricultural purposes, with the exception of steep vegetated land associated with the Toowoomba Escarpment. Where required, large-scale machinery will be used to assist in vegetation clearance or trimming activities. This will generate traffic on surrounding roads. Temporary stockpiles of cleared vegetation may also be present. Topsoil, subsoil, rock and other unsuitable materials will be removed where necessary to create stable and level areas for infrastructure to be constructed. This will result in the temporary presence of exposed areas of land.	 Source: ARTC
Creation of stockpiles (existing material from site) Stockpiles of materials cleared from site will be present in the laydown areas in the temporary construction disturbance footprint, where they will be stored prior to use, re-use or disposal. This includes material from cut-and-fill sites, and large volumes of spoil from the Toowoomba Range tunnel.	 Source: Lat27
Creation of stockpiles (material delivered to site) Stockpiles of materials delivered to the Project disturbance footprint will be present in the laydown areas and beside the existing rail corridor, where they will be stored prior to use. This includes clean ballast, soil stockpiles and rail materials including precast elements such as tracks and sleepers. There are no borrow pits proposed for the Project.	 Source: ARTC
Road and railway construction The construction of new haul roads and rail infrastructure within the LVIA study area would convey construction traffic to and within the construction areas resulting in short-term impacts on landscape and visual values.	 Source: FFJV

Construction activities and infrastructure	Indicative imagery
Bridge and viaduct construction Bridges and viaducts will be constructed over creeks, rivers, flood plains and existing road and rail corridors. The construction of new infrastructure would convey construction traffic to and within the construction areas resulting in short-term impacts on landscape and visual values.	 **Source: ARTC**
Associated construction equipment Large-scale construction equipment and machinery such as cranes, excavators, trucks, water trucks, scrapers, graders, heavy bulldozers, generators and dump trucks will be required for construction activities.	 **Source: ARTC**
Construction workforce Presence of construction workers wearing high visibility Personal Protective Equipment (PPE). The construction workforce is expected to peak at 596 full-time equivalents (FTE) at week 60 of the construction schedule, and maintain a high staff load of 465 FTE team members between weeks 40 to 122. No construction accommodation camps are proposed for the Project, due to the close proximity of nearby centres that will offer both workforce and accommodation options.	 **Source: ARTC**
Construction traffic movement There will be increased traffic movement on existing State-controlled roads and local government roads. This will include a variety of vehicle types.	 **Source: Lat27**
Temporary construction lighting Site preparation activities undertaken to provide access to the rail corridor are commonly conducted during daylight hours (i.e. Monday to Friday: 6.30 am to 6.00 pm and Saturday: 6.30 am to 1.00 pm). However, some activities may be undertaken outside of standard daytime hours (e.g. tunnel construction activities will occur 24-hours a day, 7-days a week). Security night lighting would be required at the site offices and fuel storage areas. Potentially, night lighting may also be required at bridge laydown areas. If a flash butt welding facility is used during construction, it is anticipated that there would be site security lighting. The primary light source will be from large-scale temporary flood security lighting.	 **Source: FFJV**

Construction activities and infrastructure	Indicative imagery
Embankments and mounding Many embankments and mounding will be created to accommodate the rail corridor. This will be evident in areas where there is a change in levels with the existing ground, for example major cuts. In addition, culverts and bridges will be constructed over creeks and existing road corridors.	 **Source: Lat27**
Shipping containers and storage sheds Shipping containers will be delivered to construction sites via crane trucks and then stored in laydown areas. The containers commonly contain construction equipment.	 **Source: FFJV**
Site offices and associated car parking areas The Project will require a number of temporary buildings to facilitate construction activities. This will include site offices and workshops, as well as car parking areas and laydowns, in at least four locations as follows: ▸ Tunnel construction site offices, segment storage, spoil stockpile, fuel storage, bridge laydown areas for UT1 Gowrie Creek rail bridge ▸ Tunnel and bridge construction site, offices, segment storage, fuel storage ▸ Bridge laydown for Postmans Ridge viaduct, fuel storage, site offices ▸ General construction laydown, site offices, road realignment site. These sites will bring additional traffic, staff and machinery to the LVIA study area. The new, temporary built forms may be seen as uncharacteristic elements in a predominantly rural landscape.	 **Source: FFJV**
Drainage infrastructure including concrete piping Temporary and permanent drainage infrastructure will be present, including areas in close proximity to existing road corridors.	 **Source: FFJV**

Construction activities and infrastructure	Indicative imagery
Signage A large number of safety signs will be required around construction sites, especially where existing road corridors are in close proximity to the Project.	 Source: FFJV

10.6.1.2 Operation phase

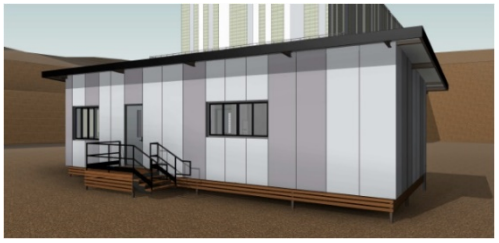
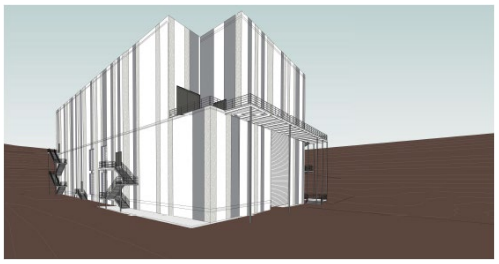
Table 10.11 describes the operational activities that will create a potential impact during the operation phase and provides example indicative imagery for each activity or infrastructure type.

TABLE 10.11 POTENTIAL LANDSCAPE AND VISUAL IMPACTS DURING THE OPERATION PHASE

Operational activities and infrastructure	Indicative imagery
Lighting infrastructure Permanent lighting is limited to lighting associated with buildings and ancillary infrastructure located at the tunnel portal locations and the intermediate tunnel ventilation building location. There will be traffic signalling associated with proposed passing loops. Emergency lighting will also be provided to rail tunnels in accordance with AS2293.1:2018 Emergency escape lighting and exit signs for buildings Part 1: System design, installation and operation (Standards Australian 2018 ,), including adjacent to the egress walkway and exit signs. There will also be standard street lighting to roads as necessary.	 Source: ARTC
Freight trains Trains may be at times visible in the landscape from existing roads and residential properties. The current assumption is that there will be on average, 33 movements per day by 2027 (likely to increase to an average 47 trains per day in 2040). The Project is designed to accommodate double stack freight trains 6.5 m high, initially up to 1,800 m long (with capacity for train lengths to increase to 3,600 m). It is expected to take between one and approximately 2.5 minutes for a train to pass. The trains will have headlights. Part of the Project alignment is currently operational, so some receptors already experience impacts from moving trains. Note: This assessment is based on the allowance for 1,800 m long trains, including double stacking. It is likely that the provision of 3,600 m trains will be subject to future approval processes.	 Source: ARTC  Source: ARTC

Operational activities and infrastructure	Indicative imagery
Road and rail bridges Bridges are an obvious built landmark for motorists and are likely to occur over rivers, creeks, rail tracks and roads. The Project proposes three bridges: ▸ One road-over-road, rail and watercourse crossing Project Chainage (Ch) 1.93 km: Gowrie Junction Road bridge (311 m) ▸ One rail bridge over watercourse crossing at Ch 3.40 km: UT1 Gowrie Creek rail bridge (56 m) ▸ One road-over-rail crossing at Ch 15.54 km: McNamaras road bridge (74 m) ▸ The proposed Gowrie Creek Rail bridge is a pre-stressed concrete slab span deck structure, while the two road bridges are typically proposed as single track, super-T girder type structures.	**Road-over-rail bridge**  **Source: Lat27 (visualisation)** **Rail-over-road bridge**  **Source: Lat27 (visualisation)**
Viaducts Viaducts are an obvious built landmark and are likely to occur over rivers, floodplains, creeks, rail tracks and roads. The Project proposes ten viaduct structures, that traverse watercourses, terrain and roads. These are typically proposed as single track, super-T girder type structures, with the exception of the Oaky Creek viaduct and Murphys Creek Road viaduct that have an additional crossing loop. Viaducts are located at: ▸ Ch 11.63 km: Oaky Creek viaduct (706 m) ▸ Ch 12.83 km: Withcott viaduct 1 (261 m) ▸ Ch 13.64 km: Withcott viaduct 2 (322 m) ▸ Ch 14.12 km: Withcott viaduct 3 (174 m) ▸ Ch 15.15 km: Withcott viaduct 4 (145 m) ▸ Ch 15.89 km: TSRC and Six Mile Creek viaduct (966 m) ▸ Ch 18.44 km: Postmans Ridge viaduct (645 m) ▸ Ch 20.98 km: Murphys Creek Road viaduct (690 m) ▸ Ch 21.84 km: Withcott Seedlings viaduct (1794 m) ▸ Ch 24.45 km: Lockyer Creek viaduct (506 m).	**Rail viaduct over terrain**  **Source: Lat27 (visualisation)** **Rail viaduct over terrain**  **Source: Lat27 (visualisation)**
Railway tracks Where buffers (for example, vegetation and topographic features) do not exist, the railway tracks are likely to become a visible element of infrastructure in the landscape, commonly sighted from adjacent roads and residential properties.	 **Source: ARTC**

Operational activities and infrastructure	Indicative imagery
Culverts Culverts (including multiple barrel culverts) are required where the route crosses small creeks, drainage lines and watercourse crossings. These comprise 22 reinforced concrete pipes and 13 reinforced concrete box culverts.	 **Source: ARTC**
Embankments, abutments and retaining walls Embankments and mounding will be created to accommodate the proposed rail infrastructure, this includes: ▸ 12 fill sections totalling approximately 15.4 km, ranging from around 160 m to 1,550 m in length; maximum embankment heights of up to 33.3 m.	 **Source: Lat27**
Cuttings and associated retaining walls Cuts will be created through areas of elevated landform, for example in the Toowoomba Range, to accommodate the proposed rail infrastructure, this includes: ▸ 13 cuttings with a total length of approximately 6.65 km with a maximum cut depth of 45.7 m ▸ A range of treatments may be used across the Project for the stabilisation of cut slopes including shotcrete (where batter 1V:1H); geosynthetics with high tensile steel wire nets and meshes (where batter between 1V:1H and 1V:1.5H) and landscape (where batter 1V:2H or shallower).	 **Source: ARTC**

Operational activities and infrastructure	Indicative imagery
Tunnels with associated tunnel portals and service buildings A 6.24 km tunnel will be driven through the Toowoomba Range from Ch 4.10 km to Ch 10.34 km to accommodate the proposed rail infrastructure. At the western and eastern tunnel entries a portal will be created, which will include service buildings, substations and ventilation control buildings. As portal infrastructure is typically situated in cut, direct views to service buildings are typically obscured. An additional ventilation control building is proposed at the intermediate ventilation shaft location, at Cranley (Ch. 6.83 km). It is also noted that venting will occur at these points.	**Typical tunnel portal**  **Source: ARTC** **Western tunnel portal showing tunnel portal ventilation building and associated infrastructure**  **Source: Lat27 (visualisation)** **Tunnel control centre perspective**  **Source: FFJV (visualisation)** **Tunnel portal ventilation building perspective**  **Source: FFJV (visualisation)**
Creation of permanent stockpiles A permanent stockpile at the western tunnel portal is proposed to manage spoil from the excavation of the Toowoomba Range tunnel. The stockpile would be a mound between 6 m to 7 m high of compacted tunnel spoil, shaped to suit the landscape and vegetated. The stockpile will also aim to mitigate noise and visual impacts during construction and operation.	 **Source: Lat27 (visualisation)**

Operational activities and infrastructure	Indicative imagery
Fencing Fencing will be provided along the rail corridor, where required in accordance with ARTC's fencing strategy (e.g. fencing at viaducts may not be required). The Project will be fenced with a three or four strand barbed wire fence. Where superior fencing is required near roads or where trespass is occurring a 1.8 m chain wire fence is proposed (e.g. where crossing loops are in close proximity to roads or where critical infrastructure is to be protected). Fauna exclusion fencing is also required in some places.	 **Source: FFJV**

10.6.2 Landscape, visual and lighting impacts

The following sections provide a summary of the impact assessment of landscape and visual amenity associated with the Project.

10.6.2.1 Landscape character impact assessment

Eight Landscape Character Types have been identified within the LVIA study area. These are identified in Figure 10.3. Seven of these LCTs are directly intersected by the Project:

- LCT A: Vegetated Watercourses—Creeks and Channels
- LCT B: Irrigated Croplands
- LCT C: Dry Croplands and Pastures
- LCT D: Vegetated Grazing
- LCT E: Rural Settlement
- LCT F: Rural Living
- LCT G: Forested Uplands.

One other LCT, LCT H: Transitional Landscapes, is present in the wider LVIA study area; however, as this area is not intersected by the Project, any impacts would be indirect and because no meaningful impacts are anticipated, LCT H: Transitional Landscapes this has not been considered further.

The LCTs are presented in Table 10.12 to Table 10.18. These tables also assess the likely sensitivities for each identified LCT in relation to the Project and provide a preliminary indication of the likely magnitude of change and consequently the likely significance of that effect on landscape amenity.

The assessment is a combined assessment of both construction and operation impacts, reflecting elements removed or disturbed during construction as well as the introduction of structures that affect the perception and character of the landscape over the longer term.

Landscape character Type A

TABLE 10.12 LANDSCAPE IMPACT ASSESSMENT OF LCT A: VEGETATED WATERCOURSES—CREEKS AND CHANNELS

Type A: Vegetated Watercourses—Creeks and Channels

Landscape baseline assessment	
Location and boundaries	This landscape type is located throughout the LVIA study area, associated with several watercourses within the Condamine–Balonne rivers catchment and Lockyer catchment. There are 13 LCAs associated with this LCT: the Gowrie Creek Vegetated Watercourse (LCA A1); Westbrook Creek Vegetated Watercourse (LCA A2); Upper Westbrook Creek Vegetated Watercourse (LCA A3); Dry Creek Vegetated Watercourse (LCA A4); Spring Creek Vegetated Watercourse (LCA A5); Meringandan Creek Vegetated Watercourse (LCA A6); Klein Creek Vegetated Watercourse (LCA A7); Reedy Creek Vegetated Watercourse (LCA A8); Lockyer Creek Vegetated Watercourse (LCA A9); Six Mile Creek Vegetated, Watercourse (LCA A10); Soda Spring Creek Vegetated Watercourse (LCA A11); Flagstone Creek Vegetated Watercourse (LCA A12); and the Sandy Creek Vegetated Watercourse (LCA A13).
Typical character images:	
     	
Key characteristics	▸ Includes creeks and low-lying effluent channels within extensive floodplains that form part of Condamine–Balonne rivers catchment ▸ Creeks within the Lockyer catchment are typically situated in steep terrain with more intact riparian vegetation ▸ These creeks convey large amounts of runoff away from the steep and elevated surrounding ranges and tablelands in rainfall events ▸ Remnant areas of flood-dependent forest/woodlands and wetlands ▸ Natural landscape with few built infrastructure elements
Precedent modifications and infrastructure elements	▸ Relatively natural landscape with minimal infrastructure, comprising road and existing rail bridges over the main creek channels within the LVIA study area ▸ In some instances, fringing vegetation has been retained and creates a buffer between adjacent land uses ▸ Telecommunication infrastructure including telegraph poles typically follows the road alignment ▸ Presence of gas pipeline infrastructure in some parts of this landscape type

Landscape character sensitivity assessment	▸ Moderate degree of perceived naturalness, with some instances of evidence of human uses and modifications to the watercourses ▸ Significant fringing vegetation in some areas contain views to and from creek lines, reducing the sensitivity. Vegetation is sparser in low-lying agricultural areas ▸ The overall sensitivity is considered to be low. This recognises that there are no formal landscape designations associated with this LCT and the landscape does not appear to be used by the local community for recreation. Additionally, parts of the LCT are already affected by the presence of road and rail infrastructure (albeit some of the rail infrastructure is no longer in active use) so it has capacity to accommodate further change
Impact assessment	
Magnitude of change assessment	▸ The Project traverses a variety of landscapes and land use, including rural landscapes, intensive agricultural areas, urban areas, fringing existing townships and the vegetated undulating foothills of the Great Dividing Range ▸ The introduction of new road and rail infrastructure into the rural and urban setting and will include five creek crossings, where the Project crosses the upper tributary of Gowrie Creek, Gowrie Creek, Oaky Creek, Six Mile Creek and Lockyer Creek ▸ LCA A1: Gowrie Creek, A9: Lockyer Creek and A10: Six Mile Creek would be traversed by the Project and/or associated road infrastructure (noting that the upper tributaries of Gowrie Creek and Oaky Creek are not identified as distinct LCAs and the impacts on these watercourses are considered within their broader context) ▸ The Project runs parallel to LCA A1: Gowrie Creek for approximately 10 km, of which approximately 5 km is underground within tunnel and therefore not visible ▸ New road and rail bridge, viaduct and railway infrastructure, as well as associated drainage infrastructure (e.g. culverts) will result in localised removal of vegetation ▸ Changes to the landscape character associated with creek and floodplain infrastructure will be evident to residents of Gowrie, as well as from the Toowoomba Bypass, Gowrie Junction Road, Krienke Road, Morris Road, Old Homebush Road, Ambrose Street, Gowrie Birnam Road, Paulsens Road, East Paulsens Road, Cattos Road, Jones Road and Gittins Road ▸ The overall magnitude of change is predicted to be moderate
Significance of effect	▸ The effect of the Project on LCT A: Vegetated Watercourses—Creeks and Channels is low

Landscape Character Type B

TABLE 10.13 LANDSCAPE IMPACT ASSESSMENT OF LCT B: VEGETATED WATERCOURSES—IRRIGATED CROPLANDS

Type B: Irrigated Croplands

Landscape baseline assessment	
Location and boundaries	This landscape type is located within the fertile floodplains of the Darling Downs and Lockyer Valley. There are 32 LCAs associated with this LCT: the Oakey North Irrigated Croplands (LCA B1); Oakey South Irrigated Croplands (LCA B2); Westbrook Creek Irrigated Croplands (LCA B3); Brimblecombe Road Irrigated Croplands (LCA B4); Wellcamp Airport Irrigated Croplands (LCA B5); Yalungur Irrigated Croplands (LCA B6); Glencoe Irrigated Croplands (LCA B7); Kingsthorpe Irrigated Croplands (LCA B8); Charlton Irrigated Croplands (LCA B9); Westbrook Irrigated Croplands (LCA B10); Wellcamp Irrigated Croplands (LCA B11); Lilydale West Irrigated Croplands (LCA B12); Lilydale East Irrigated Croplands (LCA B13); Meringandan Irrigated Croplands (LCA B14); Klein Road Irrigated Croplands (LCA B15); Highfields Road Irrigated Croplands (LCA B16); Highfields Irrigated Croplands (LCA B17); Gowrie Irrigated Croplands (LCA B18); Morris Road Irrigated Croplands (LCA B19); Birnam Irrigated Croplands (LCA B20); Upper Lockyer Irrigated Croplands (LCA B21); Murphys Creek Road Irrigated Croplands (LCA B22); Lockyer Irrigated Croplands (LCA B23); Airforce Road Irrigated Croplands (LCA B24); Helidon Irrigated Croplands (LCA B25); Flagstone Creek West Irrigated Croplands (LCA B26); Flagstone Creek Irrigated Croplands (LCA B27); Flagstone Creek East Irrigated Croplands (LCA B28); Grantham North Irrigated Croplands (LCA B29); Sandy Creek Road Irrigated Croplands (LCA B30); Grantham South Irrigated Croplands (LCA B31); and the McLucas Road Irrigated Croplands (LCA B32). These LCAs are typically located in areas with highly fertile vertosol soils.
Typical character images:	
	
	
	
	
Key characteristics	▸ Extensively developed agricultural areas ▸ Typically located in areas with highly fertile vertosol soils ▸ The vertosols, are typically cracking clay soils with high nutrients capable of supporting agriculture ▸ Extensive large and relatively flat open fields of irrigated cropland ▸ Landscape substantially cleared of vegetation, except at the periphery, along creek lines (LCT A) on the skyline and local roads ▸ In addition to irrigated production, current land use activities include grazing and dryland farming with localised recreation ▸ This LCT is not the subject of any landscape planning designations but is likely to be valued locally for scenic amenity, while the high-quality agricultural land of the Darling Downs is noted in the Toowoomba Regional Council Scenic Amenity Study as one of the region's best rural assets

Precedent modifications and infrastructure elements	▸ To enhance agricultural productivity, modifications have been made to the floodplains and low-lying alluvial areas of the Darling Downs and Lockyer Valley to improve land used for grazing, dryland cropping and irrigated cropping
Landscape character sensitivity assessment	▸ The Irrigated Croplands landscape type is predominantly visually open, with a sparsely settled rural character and no large-scale infrastructure elements. It has long distant views and strong skylines ▸ Vegetation within low-lying areas is extensively cleared and very sparse, with denser remnant vegetation along watercourses ▸ Due to the extensively modified character of the landscape and local value of the landscape in terms of landscape amenity the overall inherent sensitivity is considered to be low
Impact assessment	
Magnitude of change assessment	▸ The primary impact will be on private land where new rail infrastructure is being introduced ▸ The Project typically follows the existing West Moreton System rail corridor when passing through this LCT. Where the Project transitions to the B2G project, it deviates from the existing rail corridor west of Gowrie, impacting on LCA B8: Kingsthorpe ▸ LCA B9: Charlton will be affected; however, the Project typically follows the existing rail corridor therefore any impacts would be minor ▸ The impact on private land including irrigated farmland will be most evident near Gowrie and affect LCA B19: Morris Road, where the Project deviates from the existing West Moreton System rail corridor ▸ New infrastructure, in particular earthworks required to facilitate the Project will not be inconsistent with the current landscape character of this LCT ▸ The overall magnitude of change is predicted to be low
Significance of effect	▸ The effect of the Project on LCT B: Irrigated Croplands is negligible

Landscape Character Type C

TABLE 10.14 LANDSCAPE IMPACT ASSESSMENT OF LCT C: DRY CROPLANDS AND PASTURES

Type C: Dry Croplands and Pastures

Landscape baseline assessment	
Location and boundaries	This landscape extends across a considerable part of the LVIA study area and is largely defined by extensively cleared, often undulating, open rural properties utilised for agriculture and livestock production. There are 14 LCAs associated with this LCT: Kings Siding Dry Croplands and Pastures (LCA C1); Oakey Dry Croplands and Pastures (LCA C2); Gowrie Mountain Dry Croplands and Pastures (LCA C3); Biddeston Dry Croplands and Pastures (LCA C4); Gowrie Little Plain Dry Croplands and Pastures (LCA C5); Glencoe Dry Croplands and Pastures (LCA C6); Mount Kingsthorpe Dry Croplands and Pastures (LCA C7); Gowrie Dry Croplands and Pastures (LCA C8); Charlton Dry Croplands and Pastures (LCA C9); Wellcamp Dry Croplands and Pastures (LCA C10); Klein Road Dry Croplands and Pastures (LCA C11); Black Flagstone Road Dry Croplands and Pastures (LCA C12); Helidon Croplands and Pastures (LCA C13); and the Verdilla Dry Croplands and Pastures (LCA C14).
Typical character images:	
     	
Key characteristics	▸ The landscape is typically found on the undulating, poorer foothills of the LVIA study area surrounding the low-lying alluvial floodplains (LCT B: Irrigated Croplands) ▸ West of the Great Dividing Range, soils within this LCA are typically comprised of vertosols and to a lesser extent, dermosols, with some instances of ferrosols in the vicinity of Toowoomba, Cranley and Highfields ▸ To the east of the Great Dividing Range soils typically comprise chromosols and sodosols, with rare patches of hydrosols, vertosols and rudosols scattered throughout ▸ Vertosols are cracking clay soils, with high agricultural potential ▸ Ferrosols and dermosols are associated with previous volcanic activity and are found in higher rainfall coastal regions. They are used for intensive crop production ▸ The sodosols have a gravelly, sandy character, often exposed in areas and vulnerable to tunnel and gully erosion ▸ Chromosols are defined as strong textural contrast soils with moderate agricultural potential ▸ Sodosols are predominately found in poorly drained sites, are highly erodible and have limited agricultural potential due to their low permeability

Key characteristics [continued]	▸ Land use is predominately rural, characterised by dryland cropping and pastoral properties for livestock production ▸ Vegetation comprises native roadside shelter belts and sporadic riparian vegetation associated with creek lines ▸ Transport corridors within this LCT are typically straight in character reflecting the flat topography, with subtle kinks associated with topographic variation that connect the key settlements and rural properties. Main roads are sealed but other roads are typically unsealed gravel ▸ Open and exposed character with long distant views and strong skylines, except where views are contained by roadside or creek-side vegetation ▸ Sparsely settled landscape, with only property homesteads and cottages, and small rural 'villages' and towns such as Kingsthorpe, Gowrie and Meringandan. Homesteads are typically located on gently elevated areas, while rural residential pockets can be found on elevated peaks ▸ Harmonious but fairly typical rural character, which is valued at a local level by local communities and visitors, with the high-quality agricultural land of the Darling Downs noted in the Toowoomba Regional Council Scenic Amenity Study as one of the region's best rural assets ▸ Some areas within this LCT, particularly undulating elevated land associated with the isolated mesas and hills of Mt Kingsthorpe and Gowrie Mountain are considered to have high scenic amenity values and are acknowledged in the Toowoomba Regional Council Scenic Amenity Study
Precedent modifications and infrastructure elements	▸ Highly modified for agricultural practices, including clearing and levelling of land for cultivation of arable farmland and pastures for grazing ▸ Presence of roads, railways and bridges ▸ Telecommunication infrastructure, including telegraph poles
Landscape character sensitivity assessment	▸ The Dry Croplands and Pastures LCT is predominantly visually open, with a sparsely settled rural character and little large-scale infrastructure. It has long distant views and strong skylines ▸ Roadside shelter belts and sporadic riparian vegetation associated with creek lines and flood channels provide some screening ▸ Due to the simple character of the landscape and local value of the landscape, which is not protected in any planning scheme, the overall inherent sensitivity is considered to be low
Impact assessment	
Magnitude of change assessment	▸ Parts of LCA C3: Gowrie Mountain, C4: Biddeston and C9: Charlton would be directly affected ▸ Impact on private land, including agricultural and pastoral areas will be evident in the vicinity of Biddeston, Wellcamp, Gowrie Mountain and Gowrie (LCA C3, C4 and C9), where the Project deviates from the existing West Moreton System rail corridor ▸ The Project will be introducing new infrastructure, including tunnel portals and an intermediate ventilation shaft location and associated buildings into what is a relatively intact rural environment ▸ Impacts within this LCA will be due to localised vegetation removal, major earthworks (e.g. cuts and embankments), proposed road and rail over creek bridges as well as tunnel infrastructure ▸ Overall, therefore, the impact on this LCT is high
Significance of effect	▸ The effect of the Project on LCT C: Dry Croplands and Pastures is moderate.

Landscape Character Type D

TABLE 10.15 LANDSCAPE IMPACT ASSESSMENT OF LCT D: VEGETATED GRAZING

Type D: Vegetated Grazing

Landscape baseline assessment	
Location and boundaries	This landscape type is typically located in elevated parts of the LVIA study area, and is characterised by poorer quality soils, remnant vegetation and cattle and sheep grazing. There are 25 LCAs associated with this LCT: the Meringandan West Vegetated Grazing (LCA D1); Meringandan Vegetated Grazing (LCA D2); Glencoe West Vegetated Grazing (LCA D3); Glencoe East Vegetated Grazing (LCA D4); Gowrie Vegetated Grazing (LCA D5); Highfields Road Vegetated Grazing (LCA D6); Highfields Vegetated Grazing (LCA D7); Kleinton Road Vegetated Grazing (LCA D8); Cabarlah Park Road Vegetated Grazing (LCA D9); Birnam Vegetated Grazing (LCA D10); Wellcamp Vegetated Grazing (LCA D11); Westbrook Vegetated Grazing (LCA D12); Glenvale Vegetated Grazing (LCA D13); Cabarlah Vegetated Grazing (LCA D14); Fifteen Mile Vegetated Grazing (LCA D15); Murphys Creek South Vegetated Grazing (LCA D16); Murphys Creek North Vegetated Grazing (LCA D17); Murphys Creek Vegetated Grazing (LCA D18); Upper Lockyer Vegetated Grazing (LCA D19); Postmans Ridge Vegetated Grazing (LCA D20); Withcott Vegetated Grazing (LCA D21); Derrymore Vegetated Grazing (LCA D22); Gatton Vegetated Grazing (LCA D23); Lilydale Vegetated Grazing (LCA D24); and the Volp Road Vegetated Grazing (LCA D25).
Typical character images:	
	 
Key characteristics	▸ Very sparsely settled landscape with large land holdings and scattered homesteads ▸ Pastureland with broad areas of open wooded remnant vegetation, typically denser along creek and drainage lines and hill tops ▸ Roads are typically straight in character and unsealed gravel. Views in most instances are contained by roadside shelter belts ▸ Harmonious but fairly typical rural character ▸ Landscapes associated with Mt Davidson (Sugarloaf), in the vicinity of Blanchview, Derrymore and Silver Ridge, and Stringybark Mountain, in the vicinity of Derrymore, Flagstone Creek and Iredale are identified as being of high value in the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* ▸ In addition, some areas within this LCT, particularly undulating and vegetated elevated land in the vicinity of West Toowoomba, Blue Mountain Heights and Highfields, are considered to have high scenic amenity values and are acknowledged in the Toowoomba Regional Council Scenic Amenity Study
Precedent modifications and infrastructure elements	▸ Typically, limited levels of modification for agricultural practices, with some localised vegetation clearing ▸ Roads are typically unsealed
Landscape character sensitivity assessment	▸ The Vegetated Grazing LCT is predominantly visually contained, with a sparsely settled rural character and little large-scale infrastructure. Long distant views are possible at breaks in roadside shelter breaks ▸ Harmonious but fairly typical rural character, which is valued at a local level by local communities and visitors ▸ Due to the simple character of the landscape and local value of the landscape the overall inherent sensitivity is considered to be low

Impact assessment	
Magnitude of change assessment	▸ Parts of LCA D20: Postmans Ridge would be directly affected ▸ Impact on private land, including vegetated pastoral areas will be most evident near Postmans Ridge in LCA D20. The Project will introduce new infrastructure into what is a relatively intact rural environment ▸ This region has already been impacted by the construction of the Toowoomba Bypass. Only a small portion of the Project within this LCA follows the Toowoomba Bypass alignment ▸ Impacts within this LCT will be due to localised vegetation removal, major earthworks (e.g. cuts and embankments, including those associated with the eastern tunnel portal approach) and proposed bridges and viaducts ▸ Overall, therefore, the impact on this LCT is high
Significance of effect	▸ The effect of the Project on LCT D: Vegetated Grazing is moderate.

Landscape Character Type E

TABLE 10.16 LANDSCAPE IMPACT ASSESSMENT OF LCT E: RURAL SETTLEMENT

Type E: Rural Settlement

Landscape baseline assessment	
Location and boundaries	Ten rural settlements are located within the LVIA study area. They include Toowoomba, Kingsthorpe, Meringandan West, Meringandan, Meringandan South, Gowrie, Highfields, Murphys Creek, Withcott and Helidon. Accordingly, there are 10 LCAs associated with this LCT: Kingsthorpe (LCA E1); Meringandan West (LCA E2); Meringandan (LCA E3); Meringandan South (LCA E4); Gowrie (LCA E5); Highfields (LCA E6); Toowoomba (LCA E7); Murphys Creek (LCA E8); Withcott (LCA E9); and Helidon (LCA E10).
Typical character images:	
     	
Key characteristics	▸ Toowoomba is the largest settlement within the LVIA study area, and is a regional city servicing the Darling Downs region ▸ Small rural towns, villages and communities are low-scale built form with limited services ▸ Within rural towns buildings are typically single storey and of varying age and condition, while Toowoomba's urban centre is denser, it still has a low scale, built form and several heritage listed buildings ▸ Toowoomba and the larger settlements of Kingsthorpe, Meringandan, Gowrie, Highfields, Murphys Creek, Withcott and Helidon have social infrastructure including parks, public schools and sport facilities ▸ The Project is typically greenfield development, with 5.6 km of brownfield development where the Project is collocated with the existing rail corridor (Western Line) between Charlton and Gowrie and east of Lockyer Creek (Main Line) near Helidon ▸ The existing Main Line (heritage listed in parts) and remnants of the historic branch railway lines are located throughout the LVIA study area ▸ Kingsthorpe (LCA E1) is a town situated approximately 20 km north-west of Toowoomba. A short distance from the town centre is Kingsthorpe, the summit of which at 610 m provides elevated panoramic views of the town and surrounding landscape ▸ Meringandan West (LCA E2) is a locality situated to the west of Meringandan township ▸ Meringandan (LCA E3) is a small country town located near Highfields, approximately 19 km north, north-west of Toowoomba ▸ Meringandan South (LCA E4) is a locality situated to the south of Meringandan township ▸ Gowrie (LCA E5) is a town and locality situated approximately 10 km north-west of Toowoomba

Key characteristics [continued]	▸ Highfields (LCA E6) is a town and locality situated approximately 13 km to the north of Toowoomba and serves as a satellite suburb of the city of Toowoomba ▸ Toowoomba (LCA E7) is the largest settlement in the LVIA study area and is a regional city situated on an escarpment on the western side of the Great Dividing Range, approximately 700 m above sea level and 130 km west of Brisbane. Several scenic lookouts are located within this LCA ▸ Murphys Creek (LCA E8) is a small town located at the foot of the Great Dividing Range, 18 km north-east of Toowoomba. The existing Main Line runs through the centre of the town and the decommissioned Murphys Creek railway complex is heritage listed ▸ Withcott (LCA E9) is a small town located on the Warrego Highway, 10 km east of Toowoomba at the base of the Great Dividing Range ▸ Helidon (LCA E10) is a small town situated on Lockyer Creek, 21 km east of Toowoomba. The Warrego Highway runs to the north of the town centre, with a small outlying area located to the south of the highway. To the north of the town sandstone mining operations are discreetly tucked into the undulating and forested foothills of the Great Dividing Range, large extents of which are part of Lockyer National Park
Precedent modifications and infrastructure elements	▸ Highly modified for urban and rural land uses, including clearing of remnant vegetation and levelling of land for construction ▸ Presence of roads, railways and bridges ▸ Telecommunication infrastructure including telegraph poles ▸ Scenic lookouts with views towards the Project
Landscape character sensitivity assessment	▸ The Rural Settlements LCT has a settled rural character and includes the more urban areas associated with Toowoomba. Smaller rural communities such as Meringandan are very sparsely settled ▸ Buildings, street trees and existing vegetation provide some screening effect ▸ Typically, residential areas within these settlements are situated on elevated land overlooking the Project. In the vicinity of Kingsthorpe and Gowrie elevated views down onto the Project are possible ▸ Residential properties situated on the Toowoomba Escarpment provide open vies towards the Project, where it transects landscapes within LCT G: Forested uplands, parts of which are protected for their scenic qualities ▸ The landscape sensitivity of these settlements is moderate. While not valued within planning schemes, these settlements have a distinctive character with some elements of interest (such as buildings) and are also likely to be valued by the people that reside in or visit them
Impact assessment	
Magnitude of change assessment	▸ The Project will not directly affect any of the discussed towns and cities. Therefore, all impacts would be indirect and will relate to impacts on the landscape setting of these areas ▸ The primary impact will be on the setting of residential areas (particularly where private residential properties are elevated and overlooking the Project), particularly in areas where new road and rail infrastructure is being introduced ▸ This will be particularly evident in the vicinity of Kingsthorpe, Gowrie, the northern and eastern outer residential areas of Toowoomba (including Cotswold Hills, Wilsonton Heights, Torrington, Harlaxton, Mount Lofty, Prince Henry Heights, East Toowoomba and Rangeville), the south-western elevated residential properties of Highfields and Helidon, which are either situated close to existing railway infrastructure and/or expected to experience impacts on their landscape settings (LCA E1, E5, E6, E7 and E10) ▸ Most notably, the provision of viaducts, large cuts and embankments in LCT D and LCT G will impact the arrival experience to Toowoomba from the east (LCA E7)

Magnitude of change assessment [continued]	▸ The Project deviates from the existing West Moreton System rail corridor between Gowrie and Kingsthorpe, where it adjoins the B2G project. While within the LVIA study area, the impact of the Inland Rail Program on Kingsthorpe is better considered within the B2G LVIA due to its proximity to the B2G project and due to the presence of Mt Kingsthorpe that contains views towards the Project ▸ Near Gowrie, the Project typically follows the existing Western Line and would be consistent with the current landscape character. The proposed Gowrie Junction Road bridge will however be highly evident from nearby rural residents and residents of Gowrie. The western tunnel portal will also be evident from some parts of Gowrie ▸ Highfields is approximately 6 km north of the Project, and the town centre will not be impacted, however, the setting of newer urban growth areas to the south-west of the locality (with elevated views towards the Project and proposed western tunnel portal) is likely to be affected ▸ Near Helidon the Project deviates from the existing rail corridor. While within the LVIA study area, the impact of the Inland Rail Program on LCA E10 Helidon is better considered within the H2C LVIA (ARTC 2020) due to its proximity to the H2C project ▸ Due to their distance from the Project, as well as the undulating and vegetated nature of the surrounding landscape, the settlements of Meringandan West, Meringandan, Meringandan South, Murphys Creek and Withcott will not be impacted ▸ The impact on this LCT is indirect and, at most, moderate
Significance of effect	▸ The effect of the Project on LCT E: Rural Settlement is moderate

Landscape Character Type F

TABLE 10.17 LANDSCAPE IMPACT ASSESSMENT OF LCT F: RURAL LIVING

Type F: Rural Living

Landscape baseline assessment	
Location and boundaries	This landscape type is typically located in elevated parts of the LVIA study area, near major transport infrastructure with access to towns and services, and is characterised by large lot rural residential development, and is typically somewhat vegetated. There are 24 LCAs associated with this LCT: the Westview Rural Living (LCA F1); Meringandan West Rural Living (LCA F2); Glencoe Rural Living (LCA F3); Redlands Drive Rural Living (LCA F4); Hilltop Drive Rural Living (LCA F5); Gowrie Rural Living (LCA F6); Highfield Ridge Rural Living (LCA F7); Gowrie Mountain Rural Living (LCA F8); Torrington Rural Living (LCA F9); Cranley Rural Living (LCA F10); Glenvale Rural Living (LCA F11); Weale Street Rural Living (LCA F12); Blue Mountain Heights Rural Living (LCA F13); Cabarlah Rural Living (LCA F14); Silver Ridge Rural Living (LCA F15); Withcott South Rural Living (LCA F16); Murphys Creek North Rural Living (LCA F17); Murphys Creek South Rural Living (LCA F18); Upper Lockyer Rural Living (LCA F19); Withcott Rural Living (LCA F20); Postmans Ridge Rural Living (LCA F21); Helidon Spa Rural Living (LCA F22); Helidon Rural Living (LCA F23); and the Grantham Rural Living (LCA F24)
Typical character images:	
     	
Key characteristics	▸ Private residential dwellings on large lots, typically on elevated and undulating topography, with low-scale built form and limited local services ▸ Typically, single-storey buildings of varying age and condition ▸ Major residential growth areas can be seen on the fringe of Toowoomba city, in particular near Highfields, Gowrie, Gowrie Mountain and Toowoomba West ▸ Some rural residential areas (typically to the east of the Great Dividing Range) are densely vegetated, while others are quite open ▸ Generally, an enclosed landscape, with the exception of elevated properties where vegetation has been cleared and views towards the Project can be achieved, particularly evident from Gowrie (particularly Redlands Drive and Hilltop Drive), Highfield Ridge, Gowrie Mountain, Torrington, Cranley and Blue Mountain Heights (LCA F4, F5, F6, F7, F8, F9, F10 and F13) ▸ Highly visible landscape type throughout the LVIA study area
Precedent modifications and infrastructure elements	▸ Highly modified for urban land uses, including clearing of vegetation and levelling of land for construction ▸ Presence of roads, railways and bridges ▸ Telecommunication infrastructure including telegraph poles

Landscape character sensitivity assessment	▸ The LCT: Rural Living is predominantly visually closed, with the exception of elevated residential properties west of the Great Dividing Range, which typically include large lot areas ▸ Street trees and existing vegetation provide some screening effect ▸ The sensitivity of these rural residential areas is moderate. They have a distinctive character and are likely to be highly valued by residents who live there but have limited features considered to be of landscape or scenic amenity value
Impact assessment	
Magnitude of change assessment	▸ The Project directly affects LCA F21: Postmans Ridge, while other impacts on this LCT are indirect ▸ The Project will mostly affect the setting of the rural residential areas of Gowrie (particularly Redlands Drive and Hilltop Drive), Highfield Ridge, Gowrie Mountain, Torrington, Blue Mountain Heights and Postmans Ridge (LCA F4, F5, F6, F7, F8, F9, F13 and F22). From these locations elevated views towards the Project are accessible and new infrastructure is proposed within privately owned land, in close proximity to rural residential properties and social infrastructure including the Project and embankments ▸ The impact on Gowrie Mountain (LCA F8) will also be discussed in the B2G EIS LVIA due to its proximity to the B2G project ▸ While elevated and situated within close proximity to the Project impacts on Cranley (F10) are limited due to screening by vegetation, natural topography and embankments of the Toowoomba Bypass ▸ Rural residential properties in Postmans Ridge (F21), particularly properties on Ashlands Drive will be very close to the Project (approximately 100 m) and the setting of these areas will be affected due to direct views towards the Project (subject to the removal of existing remnant vegetation) ▸ While rural residential areas of Helidon Spa (LCA F22) are within relatively close proximity to the Project, the Project follows the existing West Moreton System rail corridor that is typically screened by existing vegetation associated with Lockyer Creek and are, therefore, not significant ▸ The rural residential areas of Cabarlah, Silver Ridge, Withcott South, Murphys Creek North, Murphys Creek South, Upper Lockyer, and Withcott (LCA F15, F16, F17, F18, F19 and F20) are at a significant distance from the Project and typically screened by remnant vegetation and topography, so impacts would be indirect and insignificant due to the distance ▸ Due to the distance of residential areas of Helidon and Grantham (LCA F23 and F24) from the Project, the impact of the Inland Rail Program on these rural residential areas will be discussed in the H2C LVIA (ARTC, 2020) as the H2C project lies closest to these LCAs ▸ Impacts on the setting of this LCA will be due to localised vegetation removal, major earthworks (e.g. cuts and embankments), proposed road and creek bridges, viaducts and tunnel portals and associated infrastructure (e.g. the Toowoomba Range Tunnel intermediate ventilation shaft and associated buildings at Cranley) ▸ Overall, therefore, the impact on this LCT is, at most, moderate
Significance of effect	▸ The effect of the Project on LCT F: Rural Living is moderate

Landscape Character Type G

TABLE 10.18 LANDSCAPE IMPACT ASSESSMENT OF LCT G: FORESTED UPLANDS

Type G: Forested Uplands

Landscape baseline assessment	
Location and boundaries	This landscape type is typically associated with elevated, undulating areas of the Great Dividing Range and remnant volcanic mountains of the Darling Downs. There are 13 LCAs associated with this LCT: Mt Davidson (Sugarloaf)—Forested Uplands (LCA G1); McGregor Mountain Forested Uplands (LCA G2); Storey Mountain Forested Uplands (LCA G3); Mt Kingsthorpe Forested Uplands (LCA G4); Gowrie Mountain Forested Uplands (LCA G5); Wellcamp Forested Uplands (LCA G6); Glenvale Mountain Forested Uplands (LCA G7); Meringandan West Forested Uplands (LCA G8); Kleinton Forested Uplands (LCA G9); Cabarlah Forested Uplands (LCA G10); Great Dividing Range Forested Uplands (LCA G11); Stringybark Mountain Forested Uplands (LCA G12); and the Lockyer National Park Forested Uplands (LCA G13)
Typical character images:	
	
	
	
Key characteristics	▸ Elevated and undulating topography, typically above 100 m Australian Height Datum (AHD) ▸ Areas of very steep slopes ▸ Distinctive landform including the densely vegetated mountain peaks and prominent ridgelines of the Great Dividing Range and the prominent basalt peaks surrounded by low-lying agricultural landscapes ▸ Incised dry creek valleys where watercourses drain the elevated area ▸ Typically, eucalyptus woodland or forest but includes areas of other vegetation including fragment rainforest ▸ Generally, an enclosed landscape with limited public access in parts and limited views ▸ Areas near Toowoomba (Redwood Park and Jubilee Park) are used for recreation and have multiple publicly accessible trails and lookouts. Mt Kingsthorpe also has a walking trail and lookout. Gowrie Mountain has a reserve that is currently closed to public access ▸ Highly visible landscape type throughout the LVIA study area ▸ Most elevated areas of this type, including peaks of the Great Dividing Range and isolated basaltic peaks amongst the Darling Downs, are considered to have high scenic amenity and are included on the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* (refer Figure 10.2) or acknowledged in the Toowoomba Regional Council Scenic Amenity Study

Precedent modifications and infrastructure elements	▸ Due to the undulating steep terrain, much of the vegetation is remnant due to the inaccessibility to clear the areas ▸ Natural landscape with very limited settlement and little large-scale infrastructure elements. However, the Great Dividing Range is traversed by the Warrego Highway and Toowoomba Bypass and the existing West Moreton System rail corridor and the landscape is also traversed by a gas pipeline and includes localised sandstone mines ▸ Large numbers of residential properties are situated along the Great Escarpment in Toowoomba, Blue Mountain Heights and Highfields with views overlooking the landscapes of the Great Dividing Range ▸ Small rural residential communities are seen on most elevated basaltic peaks within the Darling Down, including Gowrie Mountain, Storey Mountain, Mt Davidson (Sugarloaf) and Glenvale Mountain ▸ There are several lookouts within the region offering views over the Great Dividing Range and Lockyer Valley, including Picnic Point Lookout, Katoomba Point Lookout, Prince Henry Drive Lookout, Burrell Outlook, Bill Goulds Lookout, Bob Dodds Lookout, Jubilee Lookout, Mt Lofty Lookout and the Lions Scenic View Rest Area ▸ Mt Tabletop is situated within a bushland reserve, and has an unformed, very steep and unmarked track that provides access to the summit, with panoramic views towards Toowoomba, Prince Henry Heights, the Lockyer Valley and Main Range are possible ▸ Mt Kingsthorpe, 15 minutes west of Toowoomba has a graded walking track to a scenic lookout that provides expansive westerly views over the surrounding farmland and portions of the Darling Downs ▸ Infrastructure such as telecommunications towers, gas pipelines and powerlines in elevated locations (with associated cleared easements) ▸ Extensive sandstone quarry operations, both historic and present near Helidon. Typically, these operations are screened by dense native vegetation
Landscape character sensitivity assessment	▸ This LCT has little capacity to accommodate development as this would require vegetation clearance which would be visually intrusive in this elevated and undulating landscape ▸ Key areas of this landscape are also protected for their scenic qualities and are of state significance (e.g. Peaks of the Great Dividing Range), for example within the *ShapingSEQ* ▸ Landscapes associated with the Toowoomba Escarpment were also formerly identified on the Register of the National Estate, recognised for their contribution to the positive approach to the garden city of Toowoomba from the east ▸ Therefore, the landscape sensitivity of this landscape type is high
Impact assessment	
Magnitude of change assessment	▸ The Project directly transects LCA G11: Great Dividing Range ▸ Within LCA G11, the Project alignment deviates from the existing Main Line rail corridor near Helidon, passing through privately owned land before entering the eastern tunnel portal near Harlaxton Quarry, Mount Lofty. Near Helidon, the Project is approximately 2 km south of the Lockyer National Park ▸ The key impact within this LCT will be as a result of the extensive clearing due to proposed earthworks to facilitate the construction of the rail corridor, embankments, viaducts, bridges, the tunnel and the tunnel portals, which will be visible from elevated residential properties and scenic lookouts along the Great Escarpment (e.g. Picnic Point Lookout and Katoomba Lookout) ▸ A small portion of the Project within the Great Dividing Range will be tunnelled, reducing the surface impact of the Project on landscape values ▸ Elsewhere this landscape type is not within proximity to the Project, therefore the impacts on this landscape type would be indirect and attributed to views towards the Project from elevated residential properties and scenic lookouts, such as that at Mt Kingsthorpe ▸ It is considered that while the Project will be clearly evident from elevated vantage points such as Picnic Point Lookout, Katoomba Lookout and Mt Kingsthorpe, the railway will become another element in the natural and rural landscape and will not fundamentally change the character of the landscape ▸ This results in a high magnitude of change
Significance of effect	▸ The effect of the Project on LCT G: Forested Uplands is major

10.6.3 Visual impact assessment

Twenty viewpoints have been selected within the LVIA study area to represent potential visual impacts across the LVIA study area. The identified viewpoints are shown on Figure 10.4 and the assessment of each is described in Table 10.19 to Table 10.37.

10.6.3.1 Viewpoint assessment

Viewpoint 1

TABLE 10.19 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 1

Viewpoint 1: Lenora Court, Gowrie Mountain, looking north-east

Visual baseline assessment	
 Existing view from Viewpoint 1 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°30'41.297" S 151°49'44.328" E ▸ Elevation: 540 m ▸ North-easterly view from Lenora Court, Gowrie Mountain ▸ Closest part of Inland Rail is approximately 2.2 km north of this viewpoint; however, this section of Inland Rail is within the B2G section. The closest section of the (G2H) Project is 2.8 km to the north-east of this viewpoint ▸ Represents typical and accessible elevated views of residents of Gowrie Mountain ▸ Parts of elevated, vegetated landscapes visible within this view, including those associated with Mt Kingsthorpe, are identified within the Toowoomba Regional Council Scenic Amenity Study as having high scenic amenity ▸ North-easterly views from this point provide views towards the Project including landscapes typical of LCT A: Vegetated Watercourses—Creeks and Channels (LCA A1: Gowrie Creek); LCT B: Irrigated Croplands (LCA B8: Kingsthorpe, B9: Charlton and B6: Yalungur); LCT C: Dry Croplands and Pastures (LCA C7: Mt Kingsthorpe and C9: Charlton); LCT E: Rural Settlement (LCA E1: Kingsthorpe); LCT F: Rural Living (LCA F8: Gowrie Mountain, F4: Redlands Drive, F5: Hilltop Drive and F6: Gowrie); and LCT G: Forested Uplands (LCA G4: Mt Kingsthorpe)
Key visual sensitivities	▸ Moderate sensitivity of receptors, particularly relatively low number of residents of Gowrie Mountain who have elevated views over the Project ▸ The presence of existing infrastructure (Warrego Highway, West Moreton System rail corridor (Western Line) and power poles) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, due to the relatively low number of nearby residential viewers with a specific interest in this view and expansive, elevated views obtained from residential properties of Gowrie Mountain
Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1.	

Construction	
Magnitude of change assessment	▸ This viewpoint will be affected by construction works associated with the Project, as well as construction impacts associated with the construction of the adjoining B2G project, therefore these impacts are considered below ▸ The permanent infrastructure and construction earthworks associated with the Project (and adjacent B2G project) will introduce considerable construction works into the view ▸ The proposed location of a major laydown area including site offices and fuel storage on Leesons Road and the provision of two potential flash butt welding facilities near Draper Road (during the construction of the B2G project) and Paulsens Road (during the construction of the G2H Project) would cause a reduction in visual amenity from this viewpoint, however this would be temporary ▸ Earthworks associated with the Project will require large volumes of material to be removed ▸ The key impacts will relate to the presence of construction plant and disturbance due to the construction of the Project ▸ Impacts on this view will also arise due to the construction of the Chamberlain Road Bridge and large embankments associated with the B2G project ▸ Due to the distance of this viewpoint from the Project alignment, construction works will be noticeable, while the impact of these works is temporary which represents a noticeable change and low magnitude of change
Significance of effect (construction)	▸ The effect of the Project on Viewpoint 1 during construction is considered to be low
Operation	

Magnitude of change assessment—permanent infrastructure	▸ This view will be affected by both the G2H Project, and the adjoining B2G project
	▸ The nearest section of the G2H Project is approximately 2.2 km to the north of this viewpoint. The view is already affected by the presence of powerlines, power poles and the Warrego Highway, while the existing West Moreton System rail corridor can just be discerned
	▸ The magnitude of change on this receptor is anticipated to be considerable due to the following factors:
	  ▸ Introduction of additional rail infrastructure that deviates from the existing West Moreton System rail corridor into the rural landscape
	  ▸ The West Moreton System rail corridor will be largely on embankment, with heights up to around +18.0 m above the existing surface level associated with the B2G project. Embankments associated with this Project are visible in this view are up to +2.5 m
	  ▸ Due to the sparse nature of existing vegetation within the Project disturbance footprint, the effect of vegetation clearing for the construction of the Project is considered to be negligible
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this distance, the Project and adjoining B2G project will be visible and together, considerably change the visual character of the landscape, as they will be introducing new rail infrastructure on embankment into what is currently a relatively intact rural setting. This represents a moderate magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 m long with a height of 6.5 m will be clearly evident due to the open and elevated views of the railway track from this viewpoint. Elevated views to the Project will be possible for nearby residents of Gowrie Mountain. While experienced by a medium number of nearby residential properties these views are of a transient nature. Therefore, the magnitude of change is considered to be low
Significance of effect (operation)	The effect of the Project on Viewpoint 1 during operation is considered to be moderate.

Viewpoint 2

TABLE 10.20 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 2

Viewpoint 2: Hilltop Drive Park, Gowrie, looking south-east towards Toowoomba

Visual baseline assessment	
 Existing view from Viewpoint 2 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°28'58.943" S 151°52'20.885" E ▸ Elevation: 600 m ▸ South-easterly view in the direction of Toowoomba and the western tunnel portal from Hilltop Drive Park ▸ The Project is approximately 1.8 km to the south of this viewpoint ▸ Represents typical and accessible elevated views of those visiting Hilltop Drive Park and of nearby residents of Hilltop Drive and Koala Drive ▸ Location is a local park and is also representative of views attainable from nearby elevated residential properties ▸ Parts of elevated, vegetated landscapes visible within this view, including landscapes in the vicinity of Blue Mountain Heights and Highfields, are considered to have high scenic amenity values and are acknowledged in the Toowoomba Regional Council Scenic Amenity Study ▸ South-easterly views from this point provide distant views towards the Project, Gowrie Junction Road bridge, western tunnel portal and landscapes typical of LCT A: Vegetated Watercourses – Creeks and Channels (LCA A1: Gowrie Creek), LCT B: Irrigated Croplands (LCA B18: Gowrie), LCT C: Dry Croplands and Pastures (LCA C8: Gowrie and C9: Charlton), LCT E: Rural Settlement (LCA E5: Gowrie and E7: Toowoomba), LCT F: Rural Living (LCA F10: Cranley) and LCT G: Forested Uplands (LCA G4: Mt Kingsthorpe) ▸ Views are partially screened by existing vegetation
Key visual sensitivities	▸ Moderate sensitivity of receptors, particularly relatively low number of residents of Hilltop Drive who have elevated views over the Project ▸ The presence of existing infrastructure (Toowoomba Bypass, West Moreton System railway and power poles) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, which includes park users and the relatively low number of nearby residential viewers with a specific interest in this view and expansive, elevated views obtained from Hilltop Drive Park and nearby residential properties
Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1.	
Construction	
Magnitude of change assessment	▸ The construction of the Project, Gowrie Junction Road bridge, road network changes to Old Homebush Road, Morris Road, Krienke Road, McMahon Road, provision of a new access road for residents on Gowrie Junction Road and upgrade works to East Paulsens Road, construction of the western tunnel portal and western tunnel portal access road and associated earthworks will introduce considerable construction works into the view. ▸ Several laydown areas will be visible within this view, including the tunnel construction site, which includes site offices, fuel storage, a precast concrete facility, a concrete batch plant and provision for spoil storage ▸ Earthworks associated with construction of the Toowoomba Range tunnel and realigned local roads will require the movement of large volumes of material

Magnitude of change assessment [continued]	▸ A permanent stockpile at the western tunnel portal is proposed to manage spoil from the excavation of the Toowoomba Range tunnel. The stockpile would be a mound between 6 to 7 m high of compacted tunnel spoil, and it is expected the mound would be shaped to suit the landscape and vegetated ▸ In addition, while not visible within this view (due to screening foreground vegetation), the proposed location of a potential flash butt welding facility near Paulsens Road for the construction of the Project would be visible from nearby elevated residential properties on Hilltop Drive and Koala Drive. The construction phase flash butt welding facility would cause an additional reduction in visual amenity from this viewpoint; however, this reduction in amenity would be temporary ▸ Due to the relatively sparse nature of existing vegetation within the rail corridor and Project disturbance footprint, the effect of vegetation clearing for the construction of the Project is negligible ▸ Even at this distance, the presence of Project construction plant and equipment constructing the railway, Gowrie Junction Road bridge, Old Homebush Road, Paulsens Road, East Paulsens Road, Morris Road, Ganzer Road, Krienke Road, McMahon Road and provision of a new access road for residents on Gowrie Junction Road, Toowoomba Range tunnel and portal, access roads, cuts and embankments will temporarily change the character of the landscape, creating a considerable change in the landscape character of this viewpoint ▸ While construction works will be clearly evident from this vantage point the impact of these works is temporary, which represents a considerable change and moderate magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 2 during construction is considered to be moderate.
Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 1.8 km to the south of this viewpoint, while the proposed Gowrie Junction Road bridge is approximately 2.1 km to the south-east. The view is already affected by the presence of powerlines, power poles, Toowoomba Bypass and the existing West Moreton System rail corridor (Western Line)
	▸ The magnitude of change on this receptor is anticipated to be considerable due to the following factors:
	  ▸ Provision of new road and rail infrastructure, including a crossing loop, Gowrie Junction Road bridge, low embankments (typically less than 2 m above existing surface levels), western tunnel portal and associated infrastructure and road network changes to Old Homebush Road, Morris Road, Ganzer Road, Krienke Road, McMahon Road, resurfacing of East Paulsens Road and provision of a new access road for residents on Gowrie Junction Road
	  ▸ A permanent stockpile mound between 6 to 7 m high of compacted tunnel spoil (expected to be shaped and vegetated to suit the landscape)
	  ▸ Due to the sparse nature of existing vegetation within the rail corridor, the effect of vegetation clearing for the construction of the Project is considered to be negligible
	  ▸ Fencing would be provided for the extent of the rail corridor, where appropriate, and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this distance, the railway, Gowrie Junction Road bridge, western tunnel portal and associated infrastructure will be clearly evident and will have a considerable impact on the character of the landscape as it will be introducing new rail and road infrastructure into the existing rural setting as experienced from Hilltop Drive Park and nearby elevated residential properties. This represents a moderate magnitude of change

Magnitude of change assessment - train	▸ Movement of double stacked freight trains up to 1,800 m long with a height of 6.5 m, including the presence of two trains on some occasions due to the presence of the crossing loop. Also, potential dispersed exhaust fumes from ventilation buildings located at the tunnel portal could be evident due to the open and elevated views of the railway track from this viewpoint. Elevated views to the Project will be possible from Hilltop Drive Park and for nearby residents of Hilltop Drive. While experienced by a medium number of nearby residential properties these views are of transient nature. Therefore, the magnitude of change is considered to be low
Significance of effect (operation)	The effect of the Project on Viewpoint 2 during operation is considered to be moderate

Viewpoint 3

TABLE 10.21 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 3

Viewpoint 3: Charlton Pinch Road, Torrington, looking north-west over the Warrego Highway

Visual baseline assessment	
 Existing view from Viewpoint 3 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°31'48.599" S 151°52'32.418" E ▸ Elevation: 570 m ▸ North-westerly view towards Gowrie Mountain, Kingsthorpe, the Warrego Highway and Toowoomba Bypass ▸ Proposed rail alignment is approximately 3.4 km to the north of this viewpoint ▸ Represents typical and accessible views of residents of Torrington, Charlton and Cotswold Hills, and of visitors, workers and tourists travelling along the Warrego Highway ▸ Parts of elevated, vegetated landscapes visible within this view, including those associated with Gowrie Mountain and Mt Kingsthorpe, are identified within the Toowoomba Regional Council Scenic Amenity Study are identified as having high scenic amenity ▸ North-westerly views from this point provide open views towards the Warrego Highway, distant views to Gowrie Mountain and Mt Kingsthorpe, as well as landscapes typical of LCT C: Dry Croplands and Pastures (LCA C9: Charlton); LCT E: Rural Settlement (LCA E5: Gowrie and E7: Toowoomba); LCT F: Rural Living (LCA F9: Torrington); LCT G: Forested Uplands (LCA G4: Mt Kingsthorpe and G5: Gowrie Mountain); and LCT H: Transitional Landscapes (LCA H4: Charlton Industrial Precinct and H5: Charlton Raceway)
Key visual sensitivities	▸ Low sensitivity of receptors, particularly relatively low number of residents of Charlton Pinch Road who have distant elevated views over the Project ▸ The presence of existing infrastructure (Warrego Highway, Toowoomba Bypass, West Moreton System rail corridor and power poles) reduces the overall sensitivity of this view ▸ This viewpoint is considered to have a low sensitivity overall to the change proposed, due to the presence of existing infrastructure, relatively low number of nearby residential viewers with a specific interest in this view and the distance of these properties from the Project
Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1.	
Construction	
Magnitude of change assessment	▸ The construction of the Project and the location of several laydown areas and potential locations of a flash butt welding facilities will result in extensive disturbance in the landscape, however due to the distance of this viewpoint from the Project and undulating foreground topography, views towards construction activities will be limited ▸ Due to the sparse nature of existing vegetation within the rail corridor, the effect of vegetation clearing for the construction of the Project is considered to be negligible ▸ Due to the distance of this viewpoint from the Project, construction works will be barely perceptible from this vantage point and represents a negligible magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 3 during construction is considered to be negligible

Operation	
Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 3.4 km to the north-west of this viewpoint. The skyline is already affected by the presence of powerlines, power poles, the Warrego Highway and Toowoomba Bypass. The existing West Moreton System rail corridor is not able to be distinguished from this view ▸ The magnitude of change on this receptor is anticipated to be barely perceptible due to the following factors: ▸ The Project is predominately screened by existing vegetation of variations in topography from this viewpoint ▸ Introduction of new rail infrastructure will be in keeping with the existing rural character ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy ▸ At this distance, the Project will be barely perceptible and will blend into the existing rural view to some extent. This represents a negligible magnitude of change
Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 m long with a height of 6.5 m will be barely perceptible due to the distance of this viewpoint from the Project. Distant views to the Project will be possible for travellers along the Warrego Highway and nearby residents on Charlton Pinch Road and surrounding elevated areas. While anticipated to be experienced by numerous motorists, these views are of transient nature. The existing West Moreton System rail corridor currently facilitates freight train movements, albeit single stacked. Therefore, the magnitude of change is considered to be negligible
Significance of effect (operation)	The effect of the Project on Viewpoint 3 during operation is considered to be negligible

Viewpoint 4

TABLE 10.22 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 4

Viewpoint 4: Near 10 Paulsens Road, Gowrie, looking south-west towards Gowrie Junction Road bridge

Visual baseline assessment	
 Existing view from Viewpoint 4 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°29'53.718" S 151°53'21.438" E ▸ Elevation: 482 m ▸ South-westerly view towards Gowrie Junction Road bridge ▸ Proposed rail alignment is approximately 30 m to the south of this viewpoint, while the Gowrie Junction Road bridge is approximately 220 m to the west of this viewpoint ▸ Represents typical and accessible views of residents of Paulsens Road and communicates impacts on nearby residential properties situated on Morris Road, McMahon Road, Junction Street and Krienke Road ▸ Parts of elevated, vegetated landscapes are visible within the background of this view, including those associated with Gowrie Mountain, which is considered to have high scenic amenity values and is acknowledged in the Toowoomba Regional Council Scenic Amenity Study ▸ South-westerly views from this point provide open views towards the Project and existing West Moreton System rail corridor, as well as views towards landscapes typical of LCT C: Dry Croplands and Pastures (LCA C9: Charlton) and distant views to LCT G: Rural Settlement (LCA G5: Gowrie Mountain Forested Uplands)
Key visual sensitivities	▸ Moderate sensitivity of receptors, particularly relatively low number of residents of Paulsens Road, Junction Street, Morris Road, McMahon Road, Junction Street and Krienke Road, who have relatively close views towards the Project ▸ The presence of existing infrastructure (West Moreton System rail corridor and power poles) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, due to the close proximity of a relatively low number of residential receptors in this location to the Project, with a specific interest in this view—noting the presence of existing rail infrastructure somewhat reduces the sensitivity

Visual evaluation	
	
Photomontage view from Viewpoint 4 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ The construction of the Project including the proposed rail alignment, Gowrie Junction Road bridge, road network changes to Morris Road, Krienke Road, provision of a new access road for residents on Gowrie Junction Road and associated earthworks will introduce considerable construction works into the view ▸ The relatively sparse nature of existing vegetation enables open views to be obtained from nearby residential properties towards the Project, laydown areas and road realignment zones ▸ Vegetation clearing to facilitate development will be minimal and limited to vegetation along Gowrie Creek within the construction footprint for the proposed Gowrie Junction Road bridge ▸ The presence of plant constructing the Project, Morris Road, Krienke Road and associated infrastructure, access roads, cuts and embankments will temporarily change the character of the landscape, creating a considerable change in the landscape character of this viewpoint ▸ While construction works will be clearly evident from this vantage point the impact of these works is temporary which represents a considerable change and moderate magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 4 during construction is considered to be moderate
Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 30 m to the south of this viewpoint, while the proposed Gowrie Junction Road bridge is approximately 220m to the west
	▸ The skyline is already affected by the presence of power poles, powerlines, lights and road and rail infrastructure
	▸ The introduction of permanent infrastructure is anticipated to be a dominant change due to the following factors:
	  ▸ Introduction of a new single track dual-gauge railway to the south of the existing West Moreton System rail corridor, on low embankment (typically less than + 2 m)
	  ▸ Provision of the Gowrie Junction Road bridge, including associated embankments

Magnitude of change assessment—permanent infrastructure [continued]	▸ Road network changes to Morris Road and Krienke Road, including associated cuts and embankments ▸ Vegetation clearing will be limited to vegetation along Gowrie Creek within the construction footprint for the proposed Gowrie Junction Road bridge ▸ Fencing would be provided for the extent of the rail corridor, typically located on the corridor boundary. Fencing is to extend between the corridor and private land adjoining the railway. Standard rural fencing is proposed and will be in keeping with the existing rural character ▸ At this distance, the Project will be clearly evident and will change the fundamental visual character of the landscape, as it is introducing additional road and rail infrastructure into the view. This represents a high magnitude of change
Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 km long with a height of 6.5 m could be evident due to the close, open views of the railway track from this viewpoint. In addition, nearby residents of Morris Road, McMahon Road, Junction Street and Krienke Road are likely to be affected. While these views are experienced by a relatively low number of nearby residential properties who have views towards the existing West Moreton System rail corridor which currently facilitates freight train movements (single stacked) and are of transient nature, the proximity of this viewpoint to the Project increases the impact on nearby receptors. Therefore, the magnitude of change is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 4 during operation is considered to be up to high

Viewpoint 5

TABLE 10.23 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 5

Viewpoint 5: Near 14 Junction Street, Gowrie, looking east towards western tunnel portal

Visual baseline assessment	
 Existing view from Viewpoint 5 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°29'59.609" S 151°53'25.487" E ▸ Elevation: 502 m ▸ Easterly view towards the western tunnel portal ▸ Proposed rail alignment is approximately 150 m to the north of this viewpoint ▸ Represents typical and accessible elevated views of residents of Junction Street and nearby isolated rural residential properties ▸ Parts of elevated, vegetated landscapes visible within this view, including land in the vicinity of Blue Mountain Heights and Highfields, are considered to have high scenic amenity values and are acknowledged in the Toowoomba Regional Council Scenic Amenity Study ▸ Easterly views from this point provide open views towards the Project and western tunnel portal, including landscapes typical of LCT A: Vegetated Watercourses— Creeks and Channels (LCA A1: Gowrie Creek); LCT B: Irrigated Croplands (LCA B19: Morris Road); LCT C: Dry Croplands and Pastures (LCA C9: Charlton); LCT D: Vegetated Grazing (LCA D10: Birnam); and distant views to LCT E: Rural Settlement (LCA E6: Highfields and E7: Toowoomba)
Key visual sensitivities	▸ Moderate sensitivity of receptors, particularly relatively low number of residents of Junction Street who have relatively close elevated views over the Project ▸ The presence of existing infrastructure (Toowoomba Bypass, West Moreton System rail corridor and power poles) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, due to the close proximity of a relatively low number of residential receptors in this location to the Project, with a specific interest in this view—noting the presence of existing rail infrastructure somewhat reduces the sensitivity

Visual evaluation	
 Photomontage view from Viewpoint 5 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ The construction of the Project, road network changes to Morris Road, upgrade works to East Paulsens Road, construction of the western tunnel portal and the western tunnel portal access road and associated earthworks will introduce considerable construction works into the view ▸ Significant construction areas within this viewpoint are proposed including a major construction laydown area and tunnel construction site with site offices, fuel storage, segment storage, spoil stockpiles, precast concrete facility and concrete batch plant facility ▸ Earthworks associated with construction of the Project, tunnel and realigned local roads will require the movement of large volumes of material ▸ A permanent stockpile at the western tunnel portal is proposed to manage spoil from the excavation of the Toowoomba Range tunnel. The stockpile would be a mound between 6 to 7 m high of compacted tunnel spoil, shaped and vegetated to suit the landscape ▸ The relatively sparse nature of existing vegetation enables open views to be obtained from nearby residential properties towards the Project, laydown areas and road realignment zones located to both the north and south of the Project. Clearing of existing vegetation to facilitate the construction of the Project will further open up views to construction activities ▸ The presence of plant constructing the Project, Morris Road, Paulsens Road, Toowoomba Range tunnel, western tunnel portal and associated infrastructure, access roads, cuts and embankments will temporarily change the character of the landscape, creating a considerable change in the landscape character of this viewpoint ▸ While construction works will be clearly evident from this vantage point the impact of these works is temporary, which represents a considerable change and moderate magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 5 during construction is considered to be moderate
Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 150 m to the north of this viewpoint, while the proposed western tunnel portal is approximately 1.7 km to the south-east
	▸ The skyline is already affected by the presence of power poles, powerlines, lights, rail infrastructure and Toowoomba Bypass
	▸ The change in view will be noticeable, due to the following factors:
	  ▸ Introduction of a new single track dual-gauge railway to the south of the existing West Moreton System rail corridor, on low embankment (typically less than + 2 m) and transitioning into deep cut, with depths up to -20 m at the western tunnel portal entry
	  ▸ Provision of the Toowoomba Range tunnel, a 6.24 km tunnel through the Toowoomba Range and associated access roads and portal infrastructure, service buildings, substations and the intermediate tunnel ventilation shaft infrastructure

Magnitude of change assessment—permanent infrastructure [continued]	▸ A permanent stockpile mound between 6 to 7 m high of compacted tunnel spoil (expected to be shaped and vegetated to suit the landscape) ▸ Road network changes to Morris Road and upgrade works to East Paulsens Road ▸ Vegetation clearing for the construction of the Project including laydown areas will increase the visibility of the permanent rail infrastructure ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy ▸ At this distance, the Project will be clearly evident and will change the fundamental visual character of the landscape, as it is introducing new rail infrastructure, a tunnel portal and associated infrastructure into the view. This represents a high magnitude of change
Magnitude of change assessment—train	▸ Movement of double-stacked freight trains up to 1,800 m long with a height of 6.5 m and potential dispersed exhaust fumes from ventilation buildings located at the tunnel portal could be evident due to the close, open and elevated views of the railway track from this viewpoint. Elevated views to the Project and tunnel portal infrastructure will be possible for residents of Junction Street. While these views are experienced by a relatively low number of nearby residential properties who have views towards the existing West Moreton System rail corridor currently facilitates freight train movements (single stacked) and are of transient nature, the proximity of this viewpoint to the tunnel portal increases the impact on nearby receptors. Therefore, the magnitude of change is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 5 during operation is considered to be up to high

Viewpoint 6

TABLE 10.24 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 6

Viewpoint 6: Near 13–18 Treeline Drive, Gowrie, looking south

Visual baseline assessment	
 Existing view from Viewpoint 6 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°29'32.178" S 151°53'39.456" E ▸ Elevation: 510 m ▸ Southerly view towards Gowrie Creek and the existing rail corridor ▸ Project is located approximately 780 m to the south of this viewpoint, while proposed works associated with the road network changes to Old Homebush Road and the provision of the Gowrie Junction Road bridge are approximately 570 m to the south-west of this viewpoint ▸ Represents typical and accessible elevated views of visitors and residents travelling along Treeline Drive and nearby residents of Gowrie ▸ Southerly views from this point provide open views towards the Project and Gowrie Junction Road bridge from LCT E: Rural Settlement (E5: Gowrie) towards LCT A: Vegetated Watercourses—Creeks and Channels (LCA A1: Gowrie Creek); LCT B: Irrigated Croplands (LCA B18: Gowrie and B19: Birnam); LCT C: Dry Croplands and Pastures (LCA C9: Charlton); distant views towards LCT E: Rural Settlement (LCA E6: Highfields and E7: Toowoomba); and LCT F: Rural Living (LCA F10: Cranley)
Key visual sensitivities	▸ Relatively high number of receptors include nearby residents of Gowrie ▸ The urban character and presence of existing infrastructure (power poles, powerlines, and West Moreton System rail corridor) reduces the overall sensitivity of this view ▸ This viewpoint is considered to have a moderate sensitivity overall to the change proposed, due to the relatively high number but lower sensitivity of views
Visual evaluation	
 Photomontage view from Viewpoint 6 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image	

Construction	
Magnitude of change assessment	▸ The construction of the Project, Gowrie Junction Road bridge, road network changes to Old Homebush Road, Morris Road, Ganzer Road, Krienke Road, McMahon Road, provision of a new access road for residents on Gowrie Junction Road and upgrade works to East Paulsens Road and associated earthworks will introduce considerable construction works into the view ▸ Vegetation clearing to facilitate development will be minimal and limited to vegetation along Gowrie Creek within the temporary construction disturbance footprint for the proposed Gowrie Junction Road bridge and existing vegetation within the rail corridor ▸ Construction of proposed embankments, cuts, road and rail infrastructure and the Gowrie Junction Road bridge will cause disturbance within the landscape ▸ At this distance, construction works and laydown areas will be noticeable; however, they will not change the visual character of the landscape. As this change will be temporary, this is considered to be a low magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 6 during construction is considered to be low
Operation	

Magnitude of change assessment—permanent infrastructure	▸ The Gowrie Junction Road bridge is the main permanent infrastructure that will be visible from this viewpoint, which is located approximately 750 m to the south-west of this viewpoint. The view is already affected by the presence of powerlines, power poles, Toowoomba Bypass, and the existing West Moreton System rail corridor
	▸ Within this view, the Project is on a low embankment (typically less than +2 m above existing surface level), following the existing rail corridor and will be partially screened by riparian vegetation along Gowrie Creek
	▸ The magnitude of change on this receptor is anticipated to be considerable, due to the following factors:
	  ▸ Provision of new road and rail infrastructure, including the Gowrie Junction Road bridge over Gowrie Creek and the proposed and existing rail alignments (with a minimum clearance of 7.9 m over the Project), low embankments associated with new rail infrastructure and road network changes to Old Homebush Road, Morris Road, Ganzer Road, Krienke Road, McMahon Road, upgrade works to East Paulsens Road and provision of a new access road for residents on Gowrie Junction Road
	  ▸ Earthworks and embankments for the road network changes to Old Homebush Road and Gowrie Junction Road, with a maximum proposed height being approximately 9 m above natural ground
	  ▸ Vegetation clearing will have a noticeable impact on riparian vegetation along Gowrie Creek
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this distance, the Project and associated infrastructure will be clearly evident, and represent a considerable change to the view, although will largely accord with the existing character of the landscape. Therefore, it is considered to be a moderate magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 m long with a height of 6.5 m will be partially screened from this vantage point by existing vegetation. However, views to the new road bridge will be possible from elevated residential properties of Gowrie and close views to the Project from the new road bridge will be possible. Existing, albeit single-stacked, freight trains currently use the existing West Moreton System rail corridor. Due to the number of residential properties in this area and their relative proximity to the Project, the magnitude of impact is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 6 during operation is considered to be moderate

Viewpoint 7

TABLE 10.25 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 7

Viewpoint 7: 541–549 Ganzer Morris Road, looking east towards western tunnel portal	
Visual baseline assessment	
 Existing view from Viewpoint 7 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°30'15.065" S 151°54'3.15" E ▸ Elevation: 497 m ▸ Easterly view towards existing rural residential properties, Toowoomba Bypass and Boundary Street ▸ Project is approximately 200 m to the north-east of this viewpoint ▸ Represents typical and accessible views of isolated rural residents of Gowrie and of visitors, workers and drivers travelling along Ganzer Morris Road ▸ Easterly views from this point provide open views towards the Project and western tunnel portal, as well landscapes typical of LCT B: Irrigated Croplands (B19: Morris Road) and LCT C: Dry Croplands and Pastures (C9: Charlton)
Key visual sensitivities	▸ Low sensitivity of receptors, including small numbers of nearby rural residents of Gowrie to the south of the existing West Moreton System rail corridor ▸ The presence of existing infrastructure (power poles, powerlines, rail lines and Toowoomba Bypass) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a low sensitivity overall to the change proposed, due to the small number and type of viewers (local rural residents of Gowrie)

Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1; however, a birds-eye perspective view has been produced to assist in communicating the impacts of the western tunnel portal and associated infrastructure.	

Birds eye perspective view of western tunnel portal

Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.

Construction	
Magnitude of change assessment	▸ Construction works for the road network changes to Morris Road, along with the upgrade of Ganzer Morris Road and East Paulsens Road, the construction of the Project, UT1 Gowrie Creek rail bridge, and the western tunnel portal and associated portal infrastructure will be highly evident and have a temporary impact on nearby residents ▸ Some existing rural residential properties shown within the view will be resumed for the construction of the Project ▸ The construction of the Project will include the provision of a major construction laydown area and tunnel construction site with site offices, fuel storage, segment storage, spoil stockpiles, precast concrete facility and concrete batch plant facility ▸ A permanent stockpile at the western tunnel portal is proposed to manage spoil from the excavation of the Toowoomba Range tunnel. The stockpile would be a mound between 6 to 7 m high of compacted tunnel spoil, shaped and vegetated to suit the landscape ▸ Clearing of existing vegetation to facilitate the construction of the Project will further open up views to construction activities ▸ Earthworks associated with the Project and construction of the western tunnel portal and Toowoomba Range Tunnel will require large volumes of material to be excavated, and views to spoil stockpiles will be evident in this location ▸ The key impacts will relate to the clearance of existing vegetation for the construction of the Project and laydown areas, presence of construction plant and disturbance due to the construction of the Project and embankments ▸ Construction works will be clearly evident from this vantage point. As this change will be temporary, this is considered to be a moderate magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 7 during construction is considered to be low

Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 200 m to the north-east of this viewpoint
	▸ The skyline is already affected by the presence of powerlines, power poles, existing rail infrastructure and Toowoomba Bypass
	▸ The introduction of permanent infrastructure is anticipated to be a dominant change, due to the following factors:
	  ▸ Provision of a new rail infrastructure south of the existing West Moreton System rail corridor, on low embankment (typically less than +2 m) and transitioning into deep cut, with depths up to -20 m at the western tunnel portal entry
	  ▸ Provision of a tie-in to the existing West Moreton System rail corridor
	  ▸ Provision of the Toowoomba Range tunnel, a 6.24 km tunnel through the Toowoomba Range and associated access roads and portal infrastructure, service buildings, substations and ventilation buildings
	  ▸ A permanent stockpile mound between 6 to 7 m high of compacted tunnel spoil (expected to be shaped and vegetated to suit the landscape)
	  ▸ Road network changes to Ganzer Morris Road, Morris Road and East Paulsens Road
	  ▸ The resumption of existing rural residential properties shown within the view
	  ▸ Vegetation clearing for the construction of the Project and laydown areas will increase the visibility of the permanent rail infrastructure
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this distance, the Project will be highly evident and will change the fundamental visual character of the landscape, as it will be introducing new rail and road infrastructure into what is currently a relatively intact rural setting. This represents a high magnitude of change

Magnitude of change assessment—train	▸ Movement of double-stacked freight trains up to 1,800 m long with a height of 6.5 m and potential dispersed exhaust fumes from ventilation buildings located at the tunnel portal could be evident due to the open views of the Project from this viewpoint. Close views to the Project will be possible for travellers along Ganzer Morris Road, Morris Road, East Paulsens Road, Boundary Street and Toowoomba Bypass, as well as isolated rural residents in close proximity to the Project. This view will be experienced by a relatively low number of rural residents and travellers on local roads, however large numbers of motorists on Toowoomba Bypass will also experience views towards the tunnel portal and passing train movements. The existing West Moreton System rail corridor currently facilitates freight train movements, albeit single stacked. Therefore, the magnitude of change is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 7 during operation is considered to be moderate

Viewpoint 8

TABLE 10.26 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 8

Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass

Visual baseline assessment	
 Existing view from Viewpoint 8 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°30'25.349" S 151°54'32.532" E ▸ Elevation: 530 m ▸ North-westerly view over the Toowoomba Bypass towards the western tunnel portal and tie in to existing West Moreton System rail corridor ▸ Viewpoint is directly over the proposed Toowoomba Range tunnel, with the western tunnel portal situated approximately 320 m to the north-west of this viewpoint ▸ Represents typical and accessible views of nearby isolated rural residents and of visitors, workers and tourists travelling along Boundary Street and Toowoomba Bypass ▸ Parts of elevated, vegetated landscapes visible within this view, including those associated with Mt Kingsthorpe, are identified within the Toowoomba Regional Council Scenic Amenity Study are identified as having high scenic amenity ▸ North-westerly views from this point provide views towards the proposed rail alignment, western tunnel portal and Toowoomba Bypass, as well landscapes typical of LCT B: Irrigated Croplands (B19: Morris Road) and LCT C: Dry Croplands and Pastures (C9: Charlton). Distant views to LCT E: Rural Settlement (E5: Gowrie), LCT F: Rural Living (F5: Hilltop Drive and F6: Gowrie) and LCT G: Forested Uplands (G4: Mt Kingsthorpe) are also possible
Key visual sensitivities	▸ Low sensitivity of transient receptors, predominately travellers along Boundary Street (1,900 AADT 2019 data) ▸ Also representative of future driver views attainable from Toowoomba Bypass ▸ The presence of existing infrastructure (power poles, powerlines and Toowoomba Bypass) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, due to the large number of viewers tempered with the transience of and lack of specific interest in the views (e.g. travellers along Boundary Street and similar views attainable from drivers on the Toowoomba Bypass)
Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1	
Construction	
Magnitude of change assessment	▸ The construction of the Project alignment, western tunnel portal and associated infrastructure, including earthworks will introduce considerable construction works into the view. This change will be exacerbated by proximity of this viewpoint and Toowoomba Bypass to the works in this location; however, it is worth noting that the western tunnel portal and associated infrastructure are situated in a deep cut ▸ The proposed location of a laydown area approximately 230 m north-west of this viewpoint would cause a reduction in visual amenity from this viewpoint; however, this would be temporary ▸ Clearing of existing vegetation to facilitate the construction of the Project will further open up views to construction activities

Magnitude of change assessment [continued]	▸ Earthworks associated with the Project and construction of the western tunnel portal and Toowoomba Range tunnel will require large volumes of material to be excavated, and views to spoil stockpiles will be evident in this location ▸ The key impacts will relate to the clearance of existing vegetation for the construction of the rail alignment and laydown areas, presence of construction plant and disturbance due to the construction of the rail alignment, cuts and embankments ▸ Construction works will be clearly evident from this vantage point. As this change will be temporary, this is considered to be a moderate magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 8 during construction is considered to be moderate
Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 320 m to the north-west of this viewpoint. The skyline is already affected by the presence of existing infrastructure including power poles, powerlines and Toowoomba Bypass
	▸ The magnitude of change on this receptor is anticipated to be dominant due to the following factors:
	  ▸ Introduction of new rail infrastructure within what is currently a relatively intact rural setting, including major earthworks and cuts, with depths up to -20 m at the western tunnel portal entry
	  ▸ Provision of a tie-in to the existing West Moreton System rail corridor
	  ▸ Provision of the Toowoomba Range tunnel, a 6.24 km tunnel through the Toowoomba Range and associated access roads and portal infrastructure, service buildings, substations and ventilation buildings (noting that these are situated in deep cut and partially obscured from view)
	  ▸ Resumption of an existing rural residential properties within this view to facilitate the construction of the Project
	  ▸ Upgrade works to Ganzer Morris Road and provision of UT1 Gowrie Creek rail bridge
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this distance, the Project, western tunnel portal and associated infrastructure, upgrade works to Ganzer Morris Road, UT1 Gowrie Creek rail bridge, low embankments and large cuts (up to around -20 m below existing surface level) will be evident, however will not change the visual character of the landscape, as views from Boundary Street and the Toowoomba Bypass will typically be somewhat limited due to the location of Project infrastructure in deep cut. This represents a moderate magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 m long with a height of 6.5 m and potential dispersed exhaust fumes from ventilation buildings located at the tunnel portal could be evident due to the open views of the Project from this viewpoint, however closer views to train movements will typically be obscured due to the location of Project infrastructure in deep cut. Close views to the Project will be possible for travellers along Ganzer Morris Road, Boundary Street and Toowoomba Bypass, as well as isolated rural residents in close proximity to the Project. This view will be experienced by a relatively low number of rural residents and moderate to high number of travellers on local roads and the Toowoomba Bypass. Typically views experienced by road users are transient in nature; therefore, the magnitude of change is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 8 during operation is considered to be moderate

Viewpoint 9

TABLE 10.27 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 9

Viewpoint 9: Phoenix Street, Highfields looking south-west

Visual baseline assessment	
 Existing view from Viewpoint 9 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°28'44.508" S 151°55'16.133" E ▸ Elevation: 610 m ▸ South-westerly distant view towards the Project and western tunnel portal ▸ Proposed tie-in to the existing West Moreton System rail corridor is approximately 2.8 km south-west of this viewpoint while the Project and western tunnel portal are approximately 3.2 km to the south-west of this viewpoint ▸ Represents typical and accessible elevated views of visitors and residents of Highfields, particularly those situated on Phoenix Street, Federation Drive and Wedgetail Drive. Also representative of views from the nearby Highfield Ridge estate ▸ South-westerly views from this elevated point provide distant panoramic views towards the Project and western tunnel portal, including landscapes typical of LCT A: Vegetated Watercourses—Creeks and Channels (A1: Gowrie Creek); LCT B: Irrigated Croplands (B18: Gowrie, B19: Morris Road and B20: Birnam); LCT C: Dry Croplands and Pastures (C6: Glencoe and C9: Charlton); LCT D: Vegetated Grazing (D10: Birnam); LCT E: Rural Settlement (E5: Gowrie and E7: Toowoomba); LCT F: Rural Living (F10: Cranley); and LCT G: Forested Uplands (G5: Gowrie Mountain) ▸ This viewpoint is selected to represent a multitude of views obtainable from elevated residential areas in the vicinity of Highfields, Gowrie and Blue Mountain Heights
Key visual sensitivities	▸ High sensitivity of receptors, including residents and visitors of nearby residential properties and estates ▸ Although this view comprises a strong forested and rural character, the presence of the existing rural residential properties, infrastructure and the existing West Moreton System rail corridor detracts from the rural and natural qualities and sense of remoteness ▸ This viewpoint is considered to have a moderate sensitivity overall to the change proposed, due to the high sensitivity and high number of viewers (e.g. local rural residents of Highfields, Gowrie and Blue Mountains Heights) with a particular interest in this view, tempered by the distance of the receptors from the Project
Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1	
Construction	
Magnitude of change assessment	▸ The construction of the Project including the rail alignment, western tunnel portal associated access roads and portal infrastructure, including service buildings, substations and ventilation buildings and associated earthworks will introduce considerable construction works into the view ▸ Due to the distance of this viewpoint from sensitive receptors in the vicinity of Highfields, Gowrie and Blue Mountain Heights from construction activities, it is considered that impact of construction works represents a noticeable change and therefore a low magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 9 during construction is considered to be low

Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 2.8 km south-west of this viewpoint. This view is already affected by the presence of existing infrastructure including distant views towards Toowoomba Bypass
	▸ The magnitude of change on this receptor is anticipated to be noticeable due to the following factors:
	  ▸ Introduction of new rail infrastructure within what is currently a relatively intact rural setting, including major earthworks and cuts, with depths up to 20 m at the western tunnel portal entry
	  ▸ Provision of tie-in to the existing West Moreton System rail corridor, including the provision of the UT1 Gowrie Creek Rail Bridge
	  ▸ Provision of the Toowoomba Range tunnel, a 6.24 km tunnel through the Toowoomba Range and associated access roads and portal infrastructure, service buildings, substations and ventilation buildings. Potential dispersed exhaust fumes from tunnel portal ventilation buildings
	  ▸ Resumption of existing rural residential properties within this view to facilitate the construction of the Project
	  ▸ Upgrade works to Ganzer Morris Road
	  ▸ Fencing provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this distance, the Project including rail alignment, western tunnel portal and associated infrastructure, upgrade works to Ganzer Morris Road, UT1 Gowrie Creek rail bridge, low embankments and large cuts (up to around -20 m below existing surface level) will be noticeable, however due to the distance of this viewpoint from the alignment will not fundamentally change the visual character of the landscape, as new rail and road infrastructure will blend somewhat into the existing rural setting. This represents a low magnitude of change

Magnitude of change assessment—train	▸ Movement of double-stacked freight trains up to 1,800 m long with a height of 6.5 m will be barely perceptible due to the distance of this viewpoint from the Project, therefore, the magnitude of change is considered to be negligible
Significance of effect (operation)	The effect of the Project on Viewpoint 9 during operation is considered to be up to low

Viewpoint 10

TABLE 10.28 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 10

Viewpoint 10: Old Goombungee Road, Birnam looking south towards Toowoomba

Visual baseline assessment	
 Existing view from Viewpoint 10 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°29'55.314" S 151°55'45.522" E ▸ Elevation: 540 m ▸ Southerly view towards the proposed Toowoomba Range tunnel intermediate ventilation shaft location from Old Goombungee Road near the Toowoomba Christian Fellowship ▸ Project (tunnelled) is approximately 1.4 km to the south-west of this viewpoint. The Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure is located approximately 1.4 km to the south-south-east of this viewpoint, in the vicinity of the existing industrial buildings located on Hermitage Road ▸ Represents typical and accessible views of nearby isolated rural residents and of visitors, workers and tourists travelling along Old Goombungee Road ▸ Parts of elevated, vegetated landscapes are visible within this view, including land in the vicinity of Blue Mountain Heights and Highfields, which are considered to have high scenic amenity values and are acknowledged in the Toowoomba Regional Council Scenic Amenity Study ▸ Southerly views from this elevated point provide panoramic views towards the Toowoomba Range tunnel intermediate ventilation shaft location and associated buildings, and as well as including landscapes typical of LCT A: Vegetated Watercourses—Creeks and Channels (A1: Gowrie Creek); LCT C: Dry Croplands and Pastures (C9: Charlton); LCT E: Rural Settlement (E7: Toowoomba); LCT F: Rural Living (F10: Cranley); and LCT H: Transitional Landscapes (H6: Wetalla Wastewater Treatment Plant and Toowoomba Waste Management Centre)
Key visual sensitivities	▸ Low sensitivity of receptors, including nearby rural residents who have elevated views towards the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure, visitors of Toowoomba Christian Fellowship and travellers along Old Goombungee Road ▸ The presence of existing infrastructure (Toowoomba Bypass, West Moreton System rail corridor, Toowoomba Waste Management Centre (landfill), Wetalla Wastewater Treatment Plant, industrial buildings and power poles), reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a low sensitivity overall to the change proposed, due to the presence of existing infrastructure, relatively low number of nearby residential viewers with a specific interest in this view and the distance of these properties from the Project

Visual evaluation	
 Photomontage view from Viewpoint 10 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ Construction works in this location will be limited to the construction of the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure, including a ventilation building (approximately 17 m high), parking area, fire pump buildings and tanks, diversion drain, a transformer yard and a new access road ▸ Construction of this facility will require minor earthworks and some localised vegetation removal ▸ Due to the distance of this viewpoint from construction activities and screening provided by localised variations in topography and foreground vegetation associated with Gowrie Creek, it is considered that impact of construction works represents a barely perceptible change and therefore a negligible magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 9 during construction is considered to be negligible
Operation	

Magnitude of change assessment—permanent infrastructure	▸ As the Project is in tunnel in this location, views to permanent infrastructure will be limited to views towards the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure, which are situated approximately 1.4 km to the south-south-east of this viewpoint
	▸ The magnitude of change on this receptor is anticipated to be noticeable due to the following factors:
	  ▸ Provision of a ventilation building, parking area, fire pump buildings and tanks, diversion drain, a transformer yard and a new access road, in close proximity to existing industrial buildings
	  ▸ Potential smoke (in emergency situations) from the intermediate tunnel ventilation building would be noticeable
	  ▸ Localised vegetation removal will not be noticeable from this location
	▸ Due to the distance of this viewpoint from proposed infrastructure and screening provided by localised variations in topography and foreground vegetation associated with Gowrie Creek, it is considered that impact of the Toowoomba Range Tunnel intermediate ventilation shaft location and associated infrastructure, including potential smoke (during emergency situations) represents a noticeable change and therefore a low magnitude of change

Magnitude of change assessment—train	▸ The Project is in the tunnel in this location; therefore, no views towards train movements will be possible and there is no impact
Significance of effect (operation)	The effect of the Project on Viewpoint 10 during operation is considered to be negligible

Viewpoint 11

TABLE 10.29 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 11

Viewpoint 11: Looking north from Baillie Henderson Hospital, Cranley

Visual baseline assessment	
 Existing view from Viewpoint 11 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°31'20.009" S 151°56'13.854" E ▸ Elevation: 600 m ▸ Northerly view towards the proposed Toowoomba Range tunnel intermediate ventilation shaft building ▸ The Project (tunnelled) is approximately 890 m to the north-east of viewpoint, while the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure is approximately 1 km to the north-west of this viewpoint ▸ Represents typical and accessible views of visitors, staff and patients of the Baillie Henderson Hospital ▸ Parts of elevated, vegetated landscapes visible within this view, including land in the vicinity of Blue Mountain Heights and Highfields, are considered to have high scenic amenity values and are acknowledged in the Toowoomba Regional Council Scenic Amenity Study ▸ Northerly views from this point provide open elevated views towards the Toowoomba Range tunnel intermediate shaft location and associated buildings, as well as landscapes typical of LCT A: Vegetated Watercourses—Creeks and Channels (A1: Gowrie Creek); LCT C: Dry Croplands and Pastures (C6: Glencoe and C9: Charlton); LCT D: Vegetated Grazing (D10: Birnam Vegetated Grazing); LCT F: Rural Living (F7: Highfield Ridge F10: Cranley and F12: Weale Street); and LCT H: Transitional Landscapes (H6: Wetalla Wastewater Treatment Plant and Toowoomba Waste Management Centre)
Key visual sensitivities	▸ Moderate sensitivity of receptors, particularly residents and visitors of Baillie Henderson Hospital ▸ The presence of existing infrastructure (Toowoomba Bypass, West Moreton System rail corridor, Toowoomba Waste Management Centre (landfill), Wetalla Wastewater Treatment Plant, industrial buildings and power poles), reduces the overall sensitivity of this view ▸ This viewpoint is considered to have a moderate sensitivity overall to the change proposed, due to the presence of existing infrastructure, and relatively high number of nearby viewers with a specific interest in this view (including visitors, staff and patients of the Baillie Henderson Hospital) ▸ In September 2018, the Queensland Premier announced that the Baillie Henderson Hospital campus will be the site of a future new Toowoomba Hospital, and a detailed Business Case is currently being undertaken to develop a master plan for the whole Baillie Henderson Hospital campus (Darling Downs Health, 2019). It is not considered that this would affect the sensitivity

Visual evaluation	
 Photomontage view from Viewpoint 11 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ Construction works in this location will be limited to the construction of the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure, including a ventilation building (approximately 17 m high), parking area, fire pump buildings and tanks, diversion drain, a transformer yard and a new access road ▸ Construction of this facility will require minor earthworks and some localised vegetation removal ▸ Due to the distance of this viewpoint from construction activities, it is considered that impact of construction works represents a noticeable change and therefore a low magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 11 during construction is considered to be low
Operation	
Magnitude of change assessment—permanent infrastructure	▸ As the Project is in tunnel in this location, views to permanent infrastructure will be limited to views towards the Toowoomba Range tunnel intermediate ventilation shaft location and associated infrastructure, which are situated approximately 1 km to the north-west of this viewpoint. The magnitude of change on this receptor is anticipated to be noticeable due to the following factors: ▸ Noticeable change due to the provision of a ventilation building (approximately 17 m high), parking area, fire pump buildings and tanks, diversion drain, a transformer yard and a new access road, in close proximity to existing industrial buildings ▸ Potential smoke (during emergency situations) from the intermediate tunnel ventilation building would be noticeable ▸ Localised vegetation removal will be barely perceptible from this location. ▸ Due to the distance of this viewpoint from proposed infrastructure, it is considered that impact of the Toowoomba Range Tunnel intermediate ventilation shaft location and associated infrastructure, including potential smoke (during emergency situations) represents a noticeable change and therefore a low magnitude of change
Magnitude of change assessment—train	▸ The Project is in tunnel in this location, therefore no views towards train movements will be possible, therefore there is no impact
Significance of effect (operation)	The effect of the Project on Viewpoint 11 during operation is considered to be low

Viewpoint 12

TABLE 10.30 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 12

Viewpoint 12: Looking north-east from Hermitage Road, Cranley

Visual baseline assessment	
 Existing view from Viewpoint 12 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°30'56.724" S 151°55'49.548" E ▸ Elevation: 560 m ▸ North-easterly view towards the proposed Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure ▸ Project (tunnelled) is approximately 350 m to the north of viewpoint, while the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure is approximately 385 m to the north-east of this viewpoint ▸ Represents typical and accessible views of nearby workers in industrial buildings, people accessing the Toowoomba Waste Management Centre along Hermitage Road and is also considered representative of views from Toowoomba Bypass ▸ Parts of elevated, vegetated landscapes visible within this view, including land in the vicinity of Blue Mountain Heights and Highfields, are considered to have high scenic amenity values and are acknowledged in the Toowoomba Regional Council Scenic Amenity Study ▸ North-easterly views from this point provide open views towards Toowoomba Bypass and the proposed Toowoomba Range tunnel intermediate ventilation shaft location and associated buildings, as well as landscapes typical of LCT A: Vegetated Watercourses—Creeks and Channels (A1: Gowrie Creek); LCT C: Dry Croplands and Pastures (C6: Glencoe and C9: Charlton); LCT D: Vegetated Grazing (D10: Birnam Vegetated Grazing); LCT F: Rural Living (F12: Weale Street); and LCT H: Transitional Landscapes (H6: Wetalla Wastewater Treatment Plant and Toowoomba Waste Management Centre)
Key visual sensitivities	▸ Low sensitivity of transient receptors, predominately travellers along Hermitage Road (185 AADT, 2015 data) ▸ Also representative of future driver views attainable from Toowoomba Bypass ▸ The presence of existing infrastructure (Toowoomba Bypass, West Moreton System rail corridor, Toowoomba Waste Management Centre (landfill), Wetalla Wastewater Treatment Plant, industrial buildings and power poles), reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a low sensitivity overall to the change proposed, due to the low sensitivity of viewers (e.g. industrial workers and travellers along Hermitage Road and Toowoomba Bypass with a lack of specific interest in this view)

Visual evaluation	
 Photomontage view from Viewpoint 12 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ Construction works in this location will be limited to the construction of the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure, including a ventilation building (approximately 17 m high), parking area, fire pump buildings and tanks, diversion drain, a transformer yard and a new access road ▸ The construction of this facility will require minor earthworks and some localised vegetation removal ▸ Due to the proximity of this viewpoint to construction activities, it is considered that impact of construction works represents a considerable change and therefore a moderate magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 12 during construction is considered to be low
Operation	

Magnitude of change assessment—permanent infrastructure	▸ As the Project is in tunnel in this location, views to permanent infrastructure will be limited to views towards the Toowoomba Range tunnel intermediate ventilation shaft location and associated infrastructure, which are situated approximately 385 m to the north-east of this viewpoint
	▸ The magnitude of change on this receptor is anticipated to be considerable, therefore moderate, due to the following factors:
	  ▸ Considerable change due to the provision of a ventilation building (approximately 17 m high), parking area, fire pump buildings and tanks, diversion drain, a transformer yard and a new access road, in close proximity to existing industrial buildings
	  ▸ Potential smoke (during emergency situations) from the intermediate ventilation building would be noticeable
	  ▸ The absence of vegetation (removed during construction) will be noticeable from this location
	▸ Due to the close proximity of this viewpoint to the proposed infrastructure, it is considered that impact of the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure, including potential smoke (during emergency situations) represents a considerable change and therefore a moderate magnitude of change

Magnitude of change assessment—Train	▸ The Project is in tunnel in this location; therefore, no views towards train movements will be possible, therefore there is no impact
Significance of effect (operation)	The effect of the Project on Viewpoint 12 during operation is considered to be low

Viewpoint 13

TABLE 10.31 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 13

Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights

Visual baseline assessment	
 Existing view from Viewpoint 13 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°29'41.915" S 151°58'0.762" E ▸ Elevation: 600 m ▸ South-easterly view towards landscapes of the Great Dividing Range and Toowoomba Escarpment, including elevated residential properties within Mount Lofty and Prince Henry Heights and the Lockyer Valley from Keira Court, Blue Mountain Heights ▸ The Project is approximately 2.6 km to the south-east of this viewpoint, while the eastern tunnel portal is approximately 2.7 km to the south of this viewpoint ▸ Represents typical and accessible elevated views of visitors and residents of Blue Mountain Heights, particularly those situated on Keira Court. Also representative of views from the New England Highway rest area and from private residential properties situated on Murphys Creek Road, Rangeview Road, Skyline Drive, Sirron Street, Buena Vista Crescent, Hilltop Crescent and Rosewall Court ▸ Toowoomba Bypass and the existing West Moreton System rail corridor can be seen in the view ▸ Elevated forested areas visible within this viewpoint are considered to have high scenic amenity and are included (in part) on the regionally significant scenic amenity (*ShapingSEQ*) overlay; however, this particular viewpoint is not located in the overlay area ▸ South-easterly views from this elevated viewpoint provide elevated views towards the proposed rail alignment and eastern tunnel portal, as well as landscapes typical of LCT D: Vegetated Grazing (D21: Withcott Vegetated Grazing and D22: Derrymore Vegetated Grazing); LCT E: Rural Settlement (E7: Toowoomba and E9: Withcott); LCT F: Rural Living (F13: Blue Mountain Heights Rural Living); and LCT G: Forested Uplands (G11: Great Dividing Range Forested Uplands)
Key visual sensitivities	▸ Relatively high number of receptors including nearby residents of Blue Mountain Heights with elevated views over the Project ▸ Also representative of views from the New England Highway rest area and Mount Kynoch Lookout ▸ Although this view comprises a strong forested and rural character; the presence of the existing rural infrastructure (Toowoomba Bypass and West Moreton System rail corridor) reduces the overall sensitivity of this view ▸ Receptors have views over landscapes identified within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* ▸ This viewpoint is considered to have a high sensitivity overall to the change proposed, due to the relatively high number and sensitivity of viewers

Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1; however, a birds-eye perspective view has been produced to assist in communicating the impacts of the eastern tunnel portal and associated infrastructure.	
	
Birds eye perspective view of eastern tunnel portal Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ The Project and associated earthworks will introduce considerable construction works into the view ▸ In this location, views towards the construction of the Project, Oaky Creek viaduct and read network changes to Wallens Road, including two bridge laydown areas for the construction of the Oaky Creek viaduct will be possible in the centre of this view ▸ It is considered likely that views towards construction works associated with the construction of the Toowoomba Range tunnel and the eastern tunnel portal and associated portal infrastructure will be possible from other elevated residential properties within Blue Mountain Heights; however, they are obscured from this viewpoint due to foreground landform and vegetation associated with the Great Dividing Range ▸ Earthworks associated with construction of the Project, including significant cuts and the road network changes to local roads will require the movement of large volumes of material ▸ Key impacts will relate to the presence of construction plant as well as the clearance of existing vegetation for the construction of the Project including the rail alignment, viaduct structures, laydown areas, road network changes to Wallens Road and service roads, which will reduce the density of screening vegetation, increasing the visibility of the Project from Keira Court and surrounding elevated properties ▸ At this distance, construction works and laydown areas will be noticeable and will create disturbance to the landscape in this location, and it is anticipated that more open views towards construction activities will be possible for nearby residents of Blue Mountain Heights. While the impact of these is considered to be temporary, impacts on this viewpoint are considered to result in a moderate magnitude of change due to the extent of the disturbance to the landscape in this location and identification of these landscapes within the *ShapingSEQ* regionally significant amenity overlay area
Significance of effect (construction)	The effect of the Project on Viewpoint 13 during construction is considered to be high

Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the rail alignment is approximately 2.6 km to the south-east of this viewpoint
	▸ This view is already affected by the presence of existing rail infrastructure and Toowoomba Bypass
	▸ The magnitude of change on this receptor is anticipated to be considerable due to the following factors:
	  ▸ Considerable change due to the provision of a new rail infrastructure in deep cut (with depths up to -18 m) and the Oaky Creek viaduct
	  ▸ Road network changes to Wallens Road and associated earthworks
	  ▸ Vegetation clearing for the construction of the proposed Project and laydown areas will increase the visibility of the permanent rail infrastructure and be clearly evident due to the vegetated nature of this landscape
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ Even at this distance, the Project (in particular the Oaky Creek viaduct) will be clearly evident and will change the fundamental visual character of the landscape, as it will be introducing new rail infrastructure into what is currently a relatively intact rural setting, parts of which are within the *ShapingSEQ* regionally significant scenic amenity overlay area. This represents a moderate magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 m long with a height of 6.5 m will be typically screened while in cut, however distant views towards passing train movements will be possible when freight trains pass over the Oaky Creek viaduct. Due to this distance of this viewpoint from the Project, the magnitude of impact is considered to be low
Significance of effect (operation)	The effect of the Project on Viewpoint 13 during operation is considered to be high

Viewpoint 14

TABLE 10.32 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 14

Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights

Visual baseline assessment	
 Existing view from Viewpoint 14	
Location and description	▸ GPS Location: 27°32'59.796" S 151°59'50.489" E ▸ Elevation: 600 m ▸ This viewpoint is located within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* and provides northerly views towards landscapes of the Great Dividing Range, Toowoomba Escarpment and Lockyer Valley, including distant views to elevated residential properties within Blue Mountain Heights, lower-lying properties within Postmans Ridge and Withcott, landscapes within Lockyer National Park and areas within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* ▸ The Project is approximately 3.4 km to the north of this viewpoint ▸ Parts of the recently constructed Toowoomba Bypass, and associated cuts and embankments are visible within this view. Katoomba Point Lookout includes the provision of a table and chairs for visitors allowing people to rest in the area to enjoy the view ▸ Represents typical and accessible views of visitors and tourists visiting Katoomba Point Lookout, a scenic viewpoint with picnic facilities. This viewpoint is also representative of other elevated views possible from Jubilee Park, Mount Tabletop and from private elevated residential properties in Prince Henry Heights, Mount Lofty, and Harlaxton ▸ Northerly views from this elevated viewpoint provide elevated views towards the Project, as well as landscapes typical of LCT D: Vegetated Grazing (D21: Withcott Vegetated Grazing); LCT E: Rural Settlement (E9: Withcott); LCT F: Rural Living (F13: Blue Mountain Heights Rural Living and F20: Withcott Rural Living); and LCT G: Forested Uplands (G11: Great Dividing Range Forested Uplands)

Key visual sensitivities	▸ Relatively high number of receptors visiting Katoomba Point Lookout, and high number of nearby residential receptors, with a very high level of interest in this environment and views obtained from the lookout, including views over landscapes identified within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* ▸ Although this view comprises a strong forested and rural character, the presence of the existing rural infrastructure including Toowoomba Bypass and West Moreton System rail corridor (Main Line) reduces the overall sensitivity of this view ▸ This viewpoint is considered to have a high sensitivity overall to the change proposed, due to the relatively high number and high sensitivity of viewers, identification of this viewpoint as a signed and advertised scenic lookout and the situation of this viewpoint within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ*
Visual evaluation	

Photomontage view from Viewpoint 14

Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.

Construction	
Magnitude of change assessment	▸ The Project and associated earthworks will introduce considerable construction works into the view ▸ Construction works and plant constructing the Project, including the Oaky Creek viaduct, Withcott 1 viaduct, Withcott 2 viaduct, Withcott 3 viaduct, Withcott 4 viaduct and TSRC and Six Mile Creek viaduct, road network changes to Wallens Road and McNamaras Road, including McNamaras road-over-rail bridge and associated earthworks and laydown areas will be highly evident and have a temporary impact on views from Katoomba Point lookout and nearby residents ▸ Distant views will also be possible to construction works and plant constructing the Project, Murphys Creek Road viaduct, Withcott Seedlings viaduct and Lockyer Creek viaduct in the vicinity of Postmans Ridge and Helidon ▸ It is considered likely that views towards construction works associated with the construction of the Toowoomba Range Tunnel and the eastern tunnel portal and associated portal infrastructure will be possible from other elevated residential properties, particularly those within Mount Lofty and Harlaxton, however landform and vegetation associated with the Great Dividing Range obscures views to these Project elements from this viewpoint ▸ Earthworks associated with construction of the Project, including significant cuts and road network changes to local roads will require the movement of large volumes of material

Magnitude of change assessment [continued]	▸ Key impacts will relate to the clearance of existing vegetation for the construction of the Project, viaduct structures, laydown areas, road network changes to local roads and provision of service roads which will reduce the density of vegetation, increasing the visibility of the Project from Katoomba Lookout and surrounding elevated properties ▸ At this distance, construction works, including multiple bridge construction laydown areas will be noticeable and impact a considerable portion of views available from Katoomba Lookout. While the impact of these is considered to be temporary, impacts on this viewpoint are considered to result in a moderate magnitude of change due to the extent of the disturbance to the landscape in this location, identification of this location as a scenic lookout and its situation within and views towards landscapes within the *ShapingSEQ* regionally significant scenic amenity overly area
Significance of effect (construction)	The effect of the Project on Viewpoint 14 during construction is considered to be high
Operation	

Magnitude of change assessment—permanent infrastructure	▸ Nearest section of the Project is approximately 3.4 km to the north of this viewpoint
	▸ View is already affected by the presence of the Toowoomba Bypass
	▸ Magnitude of change on this receptor is anticipated to be dominant due to the following factors:
	  ▸ Dominant change due to the provision of a new rail infrastructure, including the Oaky Creek viaduct (736 m); Withcott 1 viaduct (261 m); Withcott 2 viaduct (322 m); Withcott 3 viaduct (174 m); Withcott 4 viaduct (145 m); and TSRC and Six Mile Creek viaduct (966 m) (with heights of up to +44.5 m above existing surface levels) and associated earthworks, including deep cuts with depths up to -30.5 m
	  ▸ Road network changes to Wallens Road and McNamaras Road including the provision of the McNamaras road over rail bridge with a vertical clearance of 7.1 m over the Project's rail alignment
	  ▸ Vegetation clearing for the construction of the Project and laydown areas will increase the visibility of the permanent rail infrastructure and be clearly evident due to the vegetated nature of this landscape
	  ▸ Fencing would be provided for the extent of the rail corridor, where appropriate, and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ Even at this distance, the viaduct structures associated with the Project will be clearly evident and due to the extent of the disturbance to the landscape will change the fundamental visual character of the landscape, as it will be introducing new rail infrastructure into what is currently a relatively intact rural setting, parts of which are within the *ShapingSEQ* regionally significant scenic amenity overlay area. This represents a moderate magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 m long with a height of 6.5 m will be typically screened while in cut, however distant views towards passing train movements will be possible when freight trains pass over viaduct structures. Due to this distance of this viewpoint from the Project, the magnitude of impact is considered to be low
Significance of effect (operation)	The effect of the Project on Viewpoint 14 during operation is considered to be high

Viewpoint 15

TABLE 10.33 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 15

Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville

Visual baseline assessment	
 Existing view from Viewpoint 15 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°34'43.686" S 151°59'16.601" E ▸ Elevation: 700 m ▸ Provides north-easterly views towards landscapes of the Great Dividing Range, Toowoomba Escarpment and Lockyer Valley, including distant views to lower lying properties within Postmans Ridge and Withcott, landscapes within Lockyer National Park and areas within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* ▸ The Project is approximately 6.5 km to the north of this viewpoint ▸ The Picnic Point Lookout is situated at the highest point of the Picnic Point Parklands, which are State heritage-listed and a regionally-popular tourist destination, providing opportunities to enjoy panoramic views and utilise the extensive trails along the Toowoomba Escarpment, that provide opportunities for bushwalking, mountain biking and horse riding ▸ Represents typical and accessible views of visitors and tourists visiting Picnic Point Lookout, a scenic viewpoint with visitor amenities and cafe. This viewpoint is also representative of other elevated views possible from Mt Tabletop and from private elevated residential properties in East Toowoomba and Rangeville ▸ Northerly views from this elevated viewpoint provide elevated views towards the Project, as well as landscapes typical of LCT D: Vegetated Grazing (D21: Withcott Vegetated Grazing); LCT E: Rural Settlement (E9: Withcott); LCT F: Rural Living (F13: Blue Mountain Heights Rural Living and F20: Withcott Rural Living); and LCT G: Forested Uplands (G11: Great Dividing Range Forested Uplands)
Key visual sensitivities	▸ Very high number of receptors visiting Picnic Point Lookout, a regionally marketed lookout, with a very high level of interest in this environment and views obtained from the lookout, including views over landscapes identified within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* ▸ Although this view comprises a strong forested and rural character; the presence of the existing rural infrastructure (Toowoomba Connection Road) reduces the overall sensitivity of this view ▸ This viewpoint is considered to have a high sensitivity overall to the change proposed, due to the very high number and high sensitivity of viewers and identification of this viewpoint as a signed and advertised scenic lookout
Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1. The visualisation from Katoomba Point Lookout (Viewpoint 14) is considered representative of impacts on public lookouts along the Toowoomba Escarpment and, at 3.5 km from the Project alignment, is 3 km closer to the Project than this vantage point	
Construction	
Magnitude of change assessment	▸ The Project and associated earthworks will introduce considerable construction works into the view ▸ Distant views will be possible to construction works and plant constructing the Project including the TSRC and Six Mile Creek viaduct (966 m), Postmans Ridge viaduct (644 m), Murphys Creek Road viaduct (690 m), Withcott Seedlings viaduct (1,794 m) and Lockyer Creek viaduct (506 m), road network changes to McNamaras Road including the provision of the McNamaras road over rail bridge and associated earthworks and laydown areas will be highly evident and have a temporary impact on views from Picnic Point lookout and nearby residents

Magnitude of change assessment [continued]	▸ Views towards construction works associated with the construction of the Toowoomba Range tunnel and the eastern tunnel portal and associated portal infrastructure will not be possible from this location, due to foreground landform and vegetation associated with the Great Dividing Range ▸ Earthworks associated with construction of the Project, including significant cuts and road network changes to local roads will require the movement of large volumes of material ▸ Key impacts will relate to the clearance of existing vegetation for the construction of the Project, viaduct structures, laydown areas, road network changes to local roads and provision of service roads which will reduce the density of screening vegetation, increasing the visibility of the Project from Picnic Point Lookout and surrounding elevated properties ▸ At this distance, construction works, including multiple bridge construction laydown areas will be noticeable and impact a considerable portion of views available from Picnic Point Lookout. While the impact of these is considered to be temporary, impacts on this viewpoint are considered to result in a moderate magnitude of change due to the extent of the disturbance to the landscape in this location and identification of this location as a scenic lookout
Significance of effect (construction)	The effect of the Project on Viewpoint 15 during construction is considered to be high
Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the alignment is approximately 6.5 km to the north of this viewpoint
	▸ This view is already affected by the presence of the Toowoomba Connection Road
	▸ The magnitude of change on this receptor is anticipated to be dominant due to the following factors:
	  ▸ Provision of a new rail infrastructure, including the TSRC and Six Mile Creek viaduct, Postmans Ridge viaduct, Murphys Creek Road viaduct, Withcott Seedlings viaduct and Lockyer Creek viaduct (with heights of up to 44.5 m above existing surface levels) and associated earthworks, including deep cuts with depths up to -30.5 m
	  ▸ Road network changes to McNamaras Road including the provision of the McNamaras road over rail bridge with a vertical clearance of 7.1 m over the Project's rail alignment
	  ▸ Vegetation clearing for the construction of the proposed alignment and laydown areas will increase the visibility of the permanent rail infrastructure and be clearly evident due to the existing vegetated nature of this landscape
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ Even at this distance, the alignment and viaduct structures will be clearly evident, however, due to existing infrastructure and residential development within the view, it is not anticipated that the Project will change the fundamental visual character of the landscape. It is also noted, that while landscapes within this view impacted by the Project are not within the *ShapingSEQ* regionally significant scenic amenity overlay area, they are acknowledged within the Scenic Amenity of the Lockyer report (Forest Images, 2002) as being of high scenic amenity value. Overall, it is considered that this represents a moderate magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1.8 km long with a height of 6.5 m will be typically screened while in cut, however distant views towards passing train movements will be possible when freight trains pass over viaduct structures. Due to this distance of this viewpoint from the Project, the magnitude of impact is considered to be low
Significance of effect (operation)	The effect of the Project on Viewpoint 15 during operation is considered to be high

Viewpoint 16

TABLE 10.34 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 16

Viewpoint 16: Near 102–114 Jones Road, Ballard, looking north

Visual baseline assessment	
 Existing view from Viewpoint 16 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°31'5.52" S 151°58'57.029" E ▸ Elevation: 320 m ▸ Northerly view from Jones Road towards foothills of the Great Dividing Range, and areas within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ* ▸ Project is approximately 280 m to the north of this viewpoint ▸ Represents typical and accessible views of isolated rural residents and of those travelling along Jones Road ▸ Northerly view from this point provides open views towards the Project, Oaky Creek and its tributaries as well as landscapes typical of LCT D: Vegetated Grazing (D21: Withcott Vegetated Grazing) and LCT G: Forested Uplands (G11: Great Dividing Range Forested Uplands)
Key visual sensitivities	▸ Low sensitivity of transient receptors, predominately travellers along Jones Road (1,200 AADT, 2018 data) and isolated rural residents ▸ This view comprises a strong forested and rural character ▸ This view is only anticipated to be experienced by a few nearby receptors, therefore this viewpoint is considered to have a low sensitivity overall to the change proposed
Visual evaluation	
Please note that no visualisation has been provided for this viewpoint, as discussed in Section 10.5.4.1	
Construction	
Magnitude of change assessment	▸ The Project and associated earthworks will introduce considerable construction works into the view ▸ Construction works and plant constructing the Project including the rail alignment, the Oaky Creek viaduct (736 m), road network changes to Wallens Road and associated earthworks and laydown areas in close proximity to this location will be highly evident and have a temporary impact on nearby isolated rural residents ▸ Earthworks associated with construction of the Project, including significant cuts and road network changes to local roads will require the movement of large volumes of material ▸ Key impacts will relate to the clearance of existing vegetation for the construction of the Project including the Oaky Creek viaduct, laydown areas, road network changes to Wallens Road and provision of service roads which will reduce the density of screening vegetation, increasing the visibility of the alignment from surrounding isolated rural properties ▸ At this close distance, construction works and laydown areas will be clearly evident. While the impact of these is temporary, impacts on this viewpoint are considered to result in a moderate magnitude of change due to the extent of the disturbance to the landscape in this location, including landscapes within the *ShapingSEQ* regionally significant scenic amenity overlay area
Significance of effect (construction)	The effect of the Project on Viewpoint 16 during construction is considered to be low

Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 280 m to the north of this viewpoint
	▸ This view comprises a strong forested and rural character and includes landscapes within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ*
	▸ The magnitude of change on this receptor is anticipated to be dominant due to the following factors:
	  ▸ Dominant change due to the provision of a new rail infrastructure, including the Oaky Creek viaduct, with heights of up to 38 m above existing natural surface level and in deep cut, with depths up to -18 m
	  ▸ Road network changes to Wallens Road and associated earthworks
	  ▸ Vegetation clearing for the construction of the Project and associated laydown areas will increase the visibility of the permanent rail infrastructure and be clearly evident due to the vegetated nature of this landscape
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this close distance, the Project (in particular the Oaky Creek viaduct and visual impacts associated with the removal of vegetation) will be clearly evident and will change the fundamental visual character of the landscape, as it will be introducing new rail infrastructure into what is currently a relatively intact rural setting, parts of which are within the *ShapingSEQ* regionally significant scenic amenity overlay area. This represents a high magnitude of change

Magnitude of change assessment—train	▸ Movement of double-stacked freight trains up to 1,800 m long with a height of 6.5 m will be typically screened while in cut, however close views towards passing train movements will be possible when freight trains pass over the Oaky Creek viaduct. Stationary and passing trains may be visible from within this viewshed due to the presence of the crossing loop. Due to the close proximity of this viewpoint to the Project, the magnitude of impact is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 16 during operation is considered to be moderate

Viewpoint 17

TABLE 10.35 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 17

Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west

Visual baseline assessment	
 Existing view from Viewpoint 17 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°30'55.992" S 152°1'29.358" E ▸ Elevation: 270 m ▸ Westerly view towards the Toowoomba Bypass and Gittins Road overpass. While elevated and vegetated ridges within this area are not identified within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ*, they are identified as being of high value in *Scenic Amenity of the Lockyer* (Forest Images, 2002) ▸ The Project is approximately 620 m to the north-west of this viewpoint ▸ Represents typical and accessible views of those travelling along the Toowoomba Bypass (Warrego Highway). Also representative of similar views likely to be obtained from nearby isolated residential properties and by recreational users of the Bicentennial National Trail, which follows Gittins Road in this location and is also directly impacted by the TSRC and Six Mile Creek viaduct, where it crosses Gittins Road approximately 780 m north of this viewpoint ▸ North-westerly views from this point provide open views towards the Toowoomba Bypass and the proposed Project, as well as landscapes typical of LCT D: Vegetated Grazing (D21: Withcott Vegetated Grazing) and LCT G: Forested Uplands (G11: Great Dividing Range Forested Uplands)
Key visual sensitivities	▸ While there is currently no data available regarding the number of receptors travelling along the Toowoomba Bypass, DTMR anticipated that up to 80 per cent of the daily vehicle movements using the Warrego Highway prior to the Toowoomba Bypass opening would use the new route (DTMR 2020). Based on this, it is anticipated that there could be up to 19,680 receptors travelling along the Toowoomba Bypass each day (of which up to 17 per cent are heavy vehicles) who would experience changes to the view. However, these viewers are passing at speed and would only experience transient views ▸ Also representative of recreational user views attainable from the Bicentennial National Trail, noting that the trail follows Gittins Road in this location ▸ Includes views over landscapes with a strong forested and rural character, identified within the *Scenic Amenity of the Lockyer* (Forest Images, 2002) as having high scenic amenity value ▸ The presence of existing infrastructure (Toowoomba Bypass and Gittins Road) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, due to the limited number of recreational users using the Bicentennial National Trail and the large number of viewers experiencing the view travelling along the Toowoomba Bypass, with a lack of specific interest in the views due to their transient nature

Visual evaluation	
 Photomontage view from Viewpoint 17 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ The construction of the Project including the TSRC and Six Mile Creek viaduct and associated earthworks will introduce considerable construction works into the view. This change will be exacerbated by proximity of this viewpoint and accessible views from the Toowoomba Bypass and Gittins Road to the works in this location ▸ Substantial clearing of existing vegetation would be required to facilitate the proposed laydown areas situated approximately 580 m to the north-west and west of this viewpoint and an access track along the ridgeline to the north of the Toowoomba Bypass. This would cause a reduction in visual amenity from this viewpoint; however this would be temporary ▸ Clearing of existing vegetation to facilitate the construction of the Project will further open up views to construction activities ▸ Earthworks associated with the Project, including proposed embankments, will require large volumes of material to be removed ▸ The key impacts will relate to the clearance of existing vegetation for the construction of the Project and associated laydown areas, presence of construction plant and disturbance due to the construction of the alignment, cuts and embankments ▸ Construction works will be clearly evident from this vantage point the impact of these works is temporary which represents a considerable change and moderate magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 17 during construction is considered to be moderate

Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 620 m to the north-west of this viewpoint. The skyline is already affected by the presence of existing infrastructure including Toowoomba Bypass and Gittins Road
	▸ The magnitude of change on this receptor is anticipated to be dominant due to the following factors:
	  ▸ Provision of a new rail infrastructure, including the TSRC and Six Mile Creek viaduct, with heights of up to 31 m above the Toowoomba Bypass and 53 m above Six Mile Creek
	  ▸ Vegetation clearing for the construction of the Project and associated laydown areas will increase the visibility of the permanent rail infrastructure and be clearly evident due to the vegetated nature of this landscape
	  ▸ Fencing would be provided for the extent of the rail corridor, typically located on the corridor boundary. Fencing is to extend between the corridor and private land adjoining the railway. Standard rural fencing is proposed and will be in keeping with the existing rural character
	▸ At this close distance, the Project including the TSRC and Six Mile Creek viaduct will be clearly evident and will change the fundamental visual character of the landscape, as it will be introducing new rail infrastructure into what is currently a relatively intact rural setting. This represents a high magnitude of change

Magnitude of change assessment—train	▸ Movement of double-stacked freight trains up to 1,800 km long with a height of 6.5 m will be highly evident due to the open views of the railway track from this viewpoint. These views will be experienced by a high number of motorists, and limited number of recreational users; however, these views are typically of transient nature. Therefore, the magnitude of change is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 17 during operation is considered to be high

Viewpoint 18

TABLE 10.36 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 18

Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north

Visual baseline assessment	
 Existing view from Viewpoint 18 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°31'29.735" S 152°3'54.468" E ▸ Elevation: 224 m ▸ Northerly view towards the Toowoomba Bypass and Murphys Creek Road bridge. While these areas are not identified within the regionally significant scenic amenity overlay area as defined in *ShapingSEQ*, they are identified as being of high value in *Scenic Amenity of the Lockyer* (Forest Images, 2002) ▸ Project is approximately 330 m to the north of this viewpoint ▸ Represents typical and accessible views of residents and of those travelling along Murphys Creek Road. Also representative of similar views likely to be obtained by travellers on the Toowoomba Bypass ▸ Northerly views from this point provide open views towards Toowoomba Bypass and the proposed Project, as well as landscapes typical of LCT D: Vegetated Grazing (D20: Postmans Ridge Vegetated Grazing) and LCT G: Forested Uplands (G11: Great Dividing Range Forested Uplands)
▸ Key visual sensitivities	▸ Moderate sensitivity of transient receptors, predominately travellers along Murphys Creek Road (2,242 AADT, 2019 data), which is part of a local scenic route (Cobb and Co. and Spring Bluff tourist drives) ▸ Also representative of a high number of views likely to be obtained by travellers on the Toowoomba Bypass and views from nearby residents situated on Squires Road who may have views towards proposed infrastructure in this location ▸ Includes views over landscapes with a strong forested and rural character, identified within the *Scenic Amenity of the Lockyer* (Forest Images, 2002) as having high scenic amenity value ▸ The presence of existing infrastructure (Toowoomba Bypass and the Murphys Creek Road bridge) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a moderate sensitivity overall to the change proposed, due to the large number of viewers tempered with the transience of and lack of specific interest in the views (e.g. travellers along Murphys Creek Road and Toowoomba Bypass with a lack of specific interest in this view)

Visual evaluation	
 Photomontage view from Viewpoint 18 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ The construction of the Project including rail alignment, Murphys Creek viaduct and associated earthworks will introduce considerable construction works into the view. This change will be exacerbated by proximity of this viewpoint and Toowoomba Bypass to the works in this location ▸ The proposed location of a laydown area approximately 250 m north of this viewpoint would cause a reduction in visual amenity from this viewpoint; however, this reduction in visual amenity would be temporary ▸ Clearing of existing vegetation to facilitate the construction of the Project will further open up views to construction activities ▸ Earthworks associated with the Project, including proposed embankments, will require large volumes of material to be removed ▸ The key impacts will relate to the clearance of existing vegetation for the construction of the Project and associated laydown areas, presence of construction plant and disturbance due to the construction of the alignment, cuts and embankments ▸ Construction works will be clearly evident from this vantage point the impact of these works is temporary which represents a considerable change and moderate magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 18 during construction is considered to be moderate
Operation	

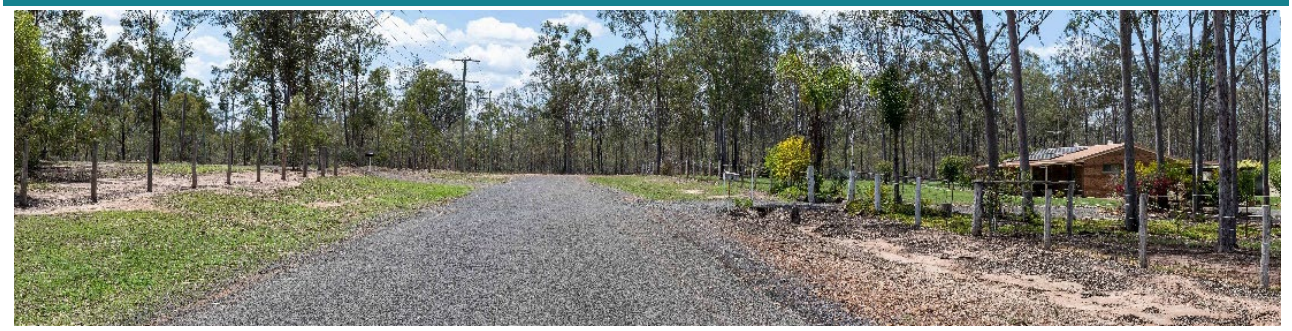
Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 330 m to the north of this viewpoint. The skyline is already affected by the presence of existing infrastructure including Toowoomba Bypass
	▸ The magnitude of change on this receptor is anticipated to be dominant due to the following factors:
	  ▸ Provision of a new rail infrastructure, including the Murphys Creek Road viaduct, with heights of up to 33 m above existing natural surface level and in cut, with depths up to -6 m
	  ▸ Vegetation clearing for the construction of the Project and associated laydown areas will increase the visibility of the permanent rail infrastructure and be clearly evident due to the vegetated nature of this landscape
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this close distance, the Project including the Murphys Creek Road viaduct will be clearly evident and will change the fundamental visual character of the landscape, as it will be introducing new rail infrastructure into what is currently a relatively intact rural setting. This represents a high magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 km long with a height of 6.5 m, including occasions when two trains will be present in the vicinity of the crossing loop on viaduct near Withcott Seedlings, will be highly evident due to the open views of the Project from this viewpoint. These views will be experienced by a high number of motorists; however, these views are typically of transient nature. Therefore, the magnitude of change is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 18 during operation is considered to be high

Viewpoint 19

TABLE 10.37 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 19

Viewpoint 19: Near 730–737 Ashlands Drive, Helidon Spa, looking north

Visual baseline assessment	
 Existing view from Viewpoint 19 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°31'29.735" S 152°3'54.468" E ▸ Elevation: 214 m ▸ Northerly view towards isolated rural residential properties of Helidon Spa ▸ The Project is approximately 225 m to the north-east of this viewpoint ▸ Represents typical and accessible views of visitors and residents of Ashlands Drive ▸ Westerly views from this point provide open views towards the existing West Moreton System rail corridor and Project, as well as landscapes typical of LCT D: Vegetated Grazing (LCA D20: Postmans Ridge) and LCT F: Rural Living (LCA F21: Postmans Ridge)
Key visual sensitivities	▸ Moderate sensitivity of receptors, particularly relatively low number of rural residents of Helidon Spa who have close views to the rail alignment ▸ The presence of existing infrastructure (power poles and powerlines) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a low sensitivity overall to the change proposed, due to the low number of nearby residential viewers with a specific interest in this view and the proximity of this viewpoint to the Project
Visual evaluation	
 Photomontage view from Viewpoint 19 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Construction	
Magnitude of change assessment	▸ The Project and associated earthworks will introduce considerable construction works into the view. This change will be exacerbated by the proximity of rural residences of Helidon Spa to the works in this location ▸ The proposed location of a laydown area for the construction of the Project including the Withcott Seedlings viaduct to the immediate north of the property (The viaduct, though not easily visible from this viewpoint, would approximately be located to the left of the viewpoint image) and Lockyer Creek viaduct nearby would cause a reduction in visual amenity from this viewpoint, however this would be temporary ▸ Due to the dense nature of existing vegetation, the effect of vegetation clearing for the construction of the Project and associated laydown area will be clearly evident

Magnitude of change assessment [continued]	▸ Earthworks associated with the Project will require large volumes of material to be removed and brought in ▸ The key impacts will relate to the removal of vegetation, presence of construction plant and disturbance due to the construction of the rail alignment, Withcott Seedlings viaduct, Lockyer Creek viaduct, cuts and embankments ▸ Construction works will be highly evident in this location due to the proximity of this viewpoint and nearby rural residential properties to the Project, proposed laydown area, as well as the extensive clearance of vegetation required. This represents a high magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 19 during construction is considered to be moderate
Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 225 m to the north-east of this viewpoint
	▸ The magnitude of change on this receptor is anticipated to be dominant due to the following factors:
	  ▸ Dominant change due to the provision of a new rail infrastructure on embankment and the Withcott Seedlings viaduct (1,794 m) into what is currently a relatively intact rural environment (noting that the Withcott Seedlings viaduct is somewhat obscured from this viewpoint, however it is anticipated that it will be more evident in views from nearby rural residential properties)
	  ▸ Due to the dense nature of existing vegetation, the effect of vegetation clearing will be clearly evident and will open up views towards the Project
	  ▸ Fencing would be provided for the extent of the rail corridor where appropriate and typically located on the corridor boundary. Fencing would be implemented as per the ARTC Fencing Strategy
	▸ At this distance, the Project will be clearly evident and will change the fundamental visual character of the landscape, as it will be introducing new rail infrastructure into what is a relatively intact rural environment in close proximity to existing rural residential properties who will have open views towards the Project. This represents a high magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 km long with a height of 6.5 m will be highly evident due to the open views of the Project from this viewpoint. Close views to the Project will be possible for nearby rural residents; however, these views will be experienced by a low number of residents and are of transient nature. Therefore, the magnitude of change is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 19 during operation is considered to be moderate

Viewpoint 20

TABLE 10.38 LIKELY VISUAL EFFECT OF THE PROJECT ON VIEWPOINT 20

Viewpoint 20: Airforce Road, Helidon, looking west

Visual baseline assessment	
 Existing view from Viewpoint 20 Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.	
Location and description	▸ GPS Location: 27°32'6" S 152°6'5.748" E ▸ Elevation: 160 m ▸ Westerly view towards the existing West Moreton System rail corridor and the intersection of Airforce Road and Cattos Road. Existing vegetation screens views to isolated rural residential properties situated to the south of the existing railway (Main Line) ▸ The Project is approximately 6 m to the south of this viewpoint, while the Lockyer Creek viaduct is approximately 685 m to the west of this viewpoint ▸ Represents typical and accessible views of those travelling along Airforce Road, including workers and visitors and residents of nearby isolated residential properties ▸ Westerly views from this point provide close, open views towards the existing West Moreton System rail corridor and Project, as well as filtered views towards landscapes typical of LCT A: Vegetated Watercourses—Creeks and Channels (LCA A9: Lockyer Creek Vegetated Watercourse); LCT B: Vegetated Grazing (LCA B24: Airforce Road Irrigated Croplands); and LCT G: Rural Living (LCA F13: Lockyer National Park Forested Uplands)
Key visual sensitivities	▸ Low sensitivity of receptors, particularly relatively low number of workers and rural residents of Helidon and Lockyer who travel along Airforce Road and have close views to the rail alignment ▸ The presence of existing infrastructure (West Moreton System rail corridor, power poles and powerlines) reduces the overall sensitivity of this view ▸ This viewpoint it is considered to have a Low sensitivity overall to the change proposed, due to the low number of nearby residential viewers with a specific interest in this view and the relatively low number of travellers along Airforce Road

Visual evaluation

Photomontage view from Viewpoint 20

Refer to Appendix H: Landscape and Visual Impact Assessment for appropriately scaled image.

Construction	
Magnitude of change assessment	▸ The construction of the Project including the proposed rail alignment, Lockyer Creek viaduct, realignment of Cattos Road and associated earthworks will introduce considerable construction works into the view. This change will be exacerbated by the proximity of isolated rural residences of Helidon and travellers along Airforce Road to the works in this location ▸ The proposed location of three laydown areas situated to the west and north-west of this viewpoint for the construction of the Project, including the Lockyer Creek viaduct would cause a reduction in visual amenity from this viewpoint, however this would be temporary. The construction laydown area on Airforce Road will contain site offices ▸ Due to the dense nature of existing vegetation, the effect of vegetation clearing for the construction of the Project and associated laydown area will be clearly evident ▸ Earthworks associated with the Project will require material to be brought in ▸ The key impacts will relate to the removal of vegetation, presence of construction plant and disturbance due to the construction of the rail alignment, Lockyer Creek viaduct, proposed retaining walls and embankments ▸ Construction works will be highly evident in this location due to the proximity of this viewpoint and nearby isolated rural residential properties to the Project, proposed laydown areas, as well as the extensive clearance of vegetation required. This represents a high magnitude of change
Significance of effect (construction)	The effect of the Project on Viewpoint 20 during construction is considered to be moderate

Operation	

Magnitude of change assessment—permanent infrastructure	▸ The nearest section of the Project is approximately 6 m to the south of this viewpoint
	▸ The magnitude of change on this receptor is anticipated to be dominant due to the following factors:
	  ▸ Dominant change due to the provision of a new rail infrastructure on a reinforced soil structure with concrete panel facing units with a maximum height of 5.5 m (approximately 5 m to the south of Airforce Road) and embankment and the Lockyer Creek viaduct (506 m) into what is currently a relatively intact rural environment (noting that the Lockyer Creek viaduct is somewhat obscured from this view, however it is anticipated that it will be more evident in views from nearby rural residential properties and further along Airforce Road)
	  ▸ Due to the dense nature of existing vegetation, the effect of vegetation clearing will be clearly evident and will open up views towards the Project
	  ▸ A concrete barrier would be provided adjacent Airforce Road
	  ▸ Fencing would be provided for the extent of the rail corridor, typically located on the corridor boundary. Fencing is to extend between the corridor and private land adjoining the railway. Adjacent Airforce Road, rural chain wire fencing is proposed, while standard rural fencing is proposed and will be in keeping with the existing rural character
	▸ At this distance, the Project will be clearly evident and will change the fundamental visual character of the landscape, as it will be introducing new rail infrastructure on high structure into what is a relatively intact rural environment (with the exception of the existing railway at grade and predominately screened by vegetation) in close proximity to existing isolated rural residential properties that will have open views towards the Project and adjacent Airforce Road. This represents a high magnitude of change

Magnitude of change assessment—train	▸ Movement of double stacked freight trains up to 1,800 km long with a height of 6.5 m will be highly evident due to the open views of the elevated railway track from this viewpoint. Close views to the Project will be possible for nearby isolated rural residents; however, these views will be experienced by a low number of residents and are of transient nature. Therefore, the magnitude of change is considered to be moderate
Significance of effect (operation)	The effect of the Project on Viewpoint 20 during operation is considered to be moderate

10.6.3.3 Lighting impact assessment

This section considers the impact of Project lighting during construction and operations. Construction lighting will only be associated with tunnel portal construction sites, site offices and fuel storage areas and is for safety and security purposes. It may also be used at bridge laydown areas and at proposed flash butt welding facilities. In terms of operational lighting, the proposed permanent lighting for the Project is associated with security lighting associated with tunnel portal locations, including the intermediate tunnel ventilation shaft location and the standard road lighting associated with the Gowrie Junction Road bridge. Transient lighting would also be associated with the train headlights as trains pass through the landscape. The viewpoint assessments detail the potential construction and operational lighting impacts for all viewpoints in Table 10.39 to Table 10.57.

Viewpoint 1

TABLE 10.39 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 1

Viewpoint 1: Lenora Court, Gowrie Mountain, looking north-east

Visual evaluation	
Sensitivity assessment	▸ Moderate as described for daytime assessment. There will be residential receptors in this location at night with elevated views towards the Project, and the residents of Gowrie Mountain would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ During construction, it is anticipated that minimal works will be undertaken at night. However, the major laydown area including satellite offices and fuel storage on Leesons Road and the provision of two potential flash butt welding facilities near Draper Road and Paulsens Road for the construction of this Project and the adjoining B2G project (visible within this view) would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 1 during construction is low
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the transient nature of impacts associated with train headlights and distance of sensitive receptors from the alignment in this location, it is considered that the impact would result in a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 1 during operation is considered to be up to low (as the trains pass), noting that the impact is transient

Viewpoint 2

TABLE 10.40 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 2

Viewpoint 2: Hilltop Drive Park, Gowrie, looking south-east towards Toowoomba

Visual evaluation	
Sensitivity assessment	▸ Moderate as described for daytime assessment. While it is unlikely that there would be receptors in this location at night, this view is also representative of elevated views towards the Project from nearby residents of Hilltop Drive and Koala Drive, who would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ During construction, tunnel construction activities will occur 24-hours a day, 7- days a week ▸ Several laydown areas will be visible within this view, including the tunnel construction site. While not visible within this view, it is considered likely that nearby residential properties would have views to the proposed location of a potential flash butt welding facility near Paulsens Road. These construction laydown areas would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, the levels would be up to 'predominantly lit' representing a low magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 2 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ Permanent standard road lighting will be required for the Gowrie Junction Road bridge, and traffic passing over the bridge will also introduce additional transient light due to vehicle headlights which will be evident to elevated residential properties in the vicinity of Hilltop Drive ▸ Permanent lighting associated with the western tunnel portal and the Toowoomba Range tunnel control centre, ventilation building, and associated infrastructure will be visible in this view; however, proposed infrastructure and associated permanent lighting is situated within cut on the approach to the tunnel portal ▸ There would be short-term impacts due to the headlight on the passing freight train, which would last for a duration of up to 2.5 minutes ▸ Due to the transient nature of impacts associated with train headlights and distance of sensitive receptors from the alignment in this location, it is considered that the impact would result in a negligible magnitude of change ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that due to this distance of this viewpoint from the light sources, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 2 during operation is considered to be low

Viewpoint 3

TABLE 10.41 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 3

Viewpoint 3: Charlton Pinch Road, Torrington, looking north-west over the Warrego Highway

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. There will be residential receptors in this location at night with distant views towards the Project, and the residents of Charlton Pinch Road would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ The construction of the Project and the location of several laydown areas and potential locations of a flash butt welding facilities will result in extensive disturbance in the landscape. However, due to the distance of this viewpoint from the Project and undulating foreground topography, views towards construction activities will be limited ▸ Distant views to several laydown areas and potential flash butt welding facilities will be visible within this view. These construction laydown areas would be lit with security lighting ▸ Due to the distance of this viewpoint from the Project and undulating foreground topography, views towards lighting associated with construction activities will be limited ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 3 during construction is considered to be negligible
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ Due to the distance of this viewpoint from the Project and presence of the Warrego Highway and associated road lighting in the foreground, it is anticipated that any short-term impacts due to the headlights on the passing freight trains, which would last for a duration of up to 2.5 minutes, would be barely perceptible. It is therefore considered that the impact would result in a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 3 during operation is considered to be up to negligible (as the trains pass), noting that the impact is transient

Viewpoint 4

TABLE 10.42 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 4

Viewpoint 4: Near 10 Paulsens Road, Gowrie, looking south-west towards Gowrie Junction Road bridge

Visual evaluation	
Sensitivity assessment	▸ Moderate as described for daytime assessment. There will be residential receptors in this location at night with close views towards the Project, and the residents of Paulsens Road, Morris Road, McMahon Road, Junction Street and Krienke Road would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ During construction, it is anticipated that minimal works will be undertaken at night, however, the bridge construction laydown areas within this view would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 4 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ There is currently a singular permanent streetlight situated immediately to the right-hand side of this view ▸ Permanent standard road lighting will be required for the Gowrie Junction Road bridge, and traffic passing over the bridge will also introduce additional transient light due to vehicle headlights, which will be highly evident to residential properties situated in close proximity to the Gowrie Junction Road bridge ▸ There would also be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ This would, at worst, change a 'predominately dark' landscape into a 'predominantly lit' landscape representing a noticeable change considered to have a low magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 4 during operation is considered to be low

Viewpoint 5

TABLE 10.43 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 5

Viewpoint 5: Near 14 Junction Street, Gowrie, looking east towards western tunnel portal

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. There will be residential receptors in this location at night with close views towards the Project, and the residents of Junction Street, who would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ During construction, tunnel construction activities will occur 24-hours a day, 7-days a week ▸ Several laydown areas will be visible within this view, including the tunnel construction site. These construction laydown areas would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, the levels would be up to 'predominantly lit' representing a low magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 5 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ Permanent lighting associated with the western tunnel portal and the Toowoomba Range tunnel control centre, ventilation building, and associated infrastructure will be visible in this view; however, proposed infrastructure and associated permanent lighting is situated within cut on the approach to the tunnel portal ▸ There would also be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 4 during operation is considered to be low

Viewpoint 6

TABLE 10.44 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 6

Viewpoint 6: Near 13–18 Treeline Drive, Gowrie, looking south

Visual evaluation	
Sensitivity assessment	▸ Moderate as described for daytime assessment. There will be a relatively high number of residential receptors in this location at night with views towards the Project and Gowrie Junction Road bridge—residents of Gowrie would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ During construction, it is anticipated that minimal works will be undertaken at night. However, the bridge construction laydown areas within this view would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 6 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ The intersection of Old Homebush Road, Gowrie–Birnam Road and Gowrie–Lilyvale Road is currently lit with permanent street lighting ▸ Permanent standard road lighting will be required for the Gowrie Junction Road bridge, and traffic passing over the bridge will also introduce additional transient light due to vehicle headlights ▸ There would also be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ This would, at worst, change a 'predominately dark' landscape into a 'predominantly lit' landscape representing a noticeable change considered to have a low magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 6 during operation is considered to be low

Viewpoint 7

TABLE 10.45 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 7

Viewpoint 7: 541–549 Ganzer Morris Road, looking east towards western tunnel portal

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. Receptors in this location at night with close views towards the Project will be limited to isolated rural receptors
Construction	
Magnitude of change assessment (construction)	▸ During construction, tunnel construction activities will occur 24-hours a day, 7-days a week ▸ Several laydown areas will be visible within this view, including the tunnel construction site. These construction laydown areas would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, due to the close proximity of this viewpoint to the tunnel construction site the levels would be up to 'brightly lit' representing a moderate magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 7 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ Permanent lighting associated with the western tunnel portal and the Toowoomba Range tunnel control centre, ventilation building, and associated infrastructure will be visible in this view; however, proposed infrastructure and associated permanent lighting is situated within cut on the approach to the tunnel portal ▸ There would also be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, due to the close proximity of this viewpoint to the tunnel portal, with careful planning, the levels would be up to 'predominantly lit' representing a low magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 7 during operation is considered to be negligible

Viewpoint 8

TABLE 10.46 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 8

Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. Travellers passing along Boundary Street and the Toowoomba Bypass at night, whose interest in the transient views obtained at night is expected to be very low, even compared to daytime interest
Construction	
Magnitude of change assessment (construction)	▸ During construction, tunnel construction activities will occur 24 hours a day, 7 days a week ▸ Several laydown areas will be visible within this view, including the tunnel construction site. These construction laydown areas would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, due to the close proximity of this viewpoint to the tunnel construction site the levels would be up to 'brightly lit' representing a moderate magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 8 during construction is considered to be moderate
Operation	
Magnitude of change assessment (operation)	▸ Permanent lighting associated with the western tunnel portal and the Toowoomba Range tunnel control centre, ventilation building, and associated infrastructure will be visible in this view; however, proposed infrastructure and associated permanent lighting is situated within cut on the approach to the tunnel portal ▸ There would also be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, due to the close proximity of this viewpoint to the tunnel portal, with careful planning, the levels would be up to 'predominantly lit' representing a low magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 8 during operation is considered to be low

Viewpoint 9

TABLE 10.47 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 9

Viewpoint 9: Phoenix Street, Highfields looking south-west

Visual evaluation	
Sensitivity assessment	▸ Moderate as described for daytime assessment. There will be a high number of residential receptors in this location at night with distant elevated views towards the Project, and the residents of Highfields would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ During construction, tunnel construction activities will occur 24-hours a day, 7-days a week ▸ Several laydown areas will be visible within this view, including the tunnel construction site. These construction laydown areas would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, due to this distance of receptors in this location from the Project, the levels would remain 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 9 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ Permanent lighting associated with the western tunnel portal and the Toowoomba Range tunnel control centre, ventilation building, and associated infrastructure will be visible in this view; however, proposed infrastructure and associated permanent lighting is situated within cut on the approach to the tunnel portal ▸ There would also be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that due to this distance of this viewpoint from the light sources, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 9 during operation is considered to be low

Viewpoint 10

TABLE 10.48 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 10

Viewpoint 10: Old Goombungee Road, Birnam looking south towards Toowoomba

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. Receptors in this location at night with close views towards the Project will be limited to isolated rural receptors and travellers passing along Goombungee Road at night, whose interest in the transient views obtained at night is expected to be very low, even compared to daytime interest
Construction	
Magnitude of change assessment (construction)	▸ During construction, tunnel construction activities will occur 24-hours a day, 7-days a week ▸ The intermediate ventilation shaft construction site will be visible within this view, which will be lit with security lighting ▸ The current light levels are assumed to be 'predominately lit' and it is assumed that, the levels would remain 'predominantly lit' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 10 during construction is considered to be negligible
Operation	
Magnitude of change assessment (operation)	▸ Existing permanent road lighting associated with the Toowoomba Bypass–Mort Street Interchange is visible in this view ▸ In addition to this, there is also existing site security lighting associated with the Toowoomba Christian Fellowship, Toowoomba Waste Management Centre (landfill), Wetalla Wastewater Treatment Plant and industrial buildings in this area ▸ Lighting associated with residential properties within Toowoomba and the Baillie Henderson Hospital are visible in this view ▸ Permanent lighting associated with the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure will be visible in this view; however it will blend somewhat into the existing setting ▸ The current light levels are assumed to be 'predominately lit' and it is assumed that, with careful planning, the levels would remain up to 'predominantly lit' representing a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 10 during operation is considered to be negligible

Viewpoint 11

TABLE 10.49 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 11

Viewpoint 11: Looking north from Baillie Henderson Hospital, Cranley

Visual evaluation	
Sensitivity assessment	▸ Moderate as described for daytime assessment. Relatively high number of receptors in this location at night with elevated views towards the Project, particularly visitors, staff and patients of the Baillie Henderson Hospital
Construction	
Magnitude of change assessment (construction)	▸ During construction, tunnel construction activities will occur 24-hours a day, 7-days a week ▸ The intermediate ventilation shaft construction site will be visible within this view, which will be lit with security lighting ▸ The current light levels are assumed to be 'predominately lit' and it is assumed that, the levels would remain 'predominantly lit' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 11 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ Existing permanent road lighting associated with the Toowoomba Bypass–Mort Street Interchange is visible in this view ▸ In addition to this, there is also existing site security lighting associated with the Toowoomba Waste Management Centre (landfill), the Wetalla Wastewater Treatment Plant and industrial buildings in this area ▸ Lighting associated with residential properties within Highfields and Cranley are visible in this view ▸ Permanent lighting associated with the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure will be visible in this view; however, it will blend somewhat into the existing setting ▸ The current light levels are assumed to be 'predominately lit' and it is assumed that, with careful planning, the levels would remain up to 'predominantly lit' representing a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 11 during operation is considered to be low

Viewpoint 12

TABLE 10.50 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 12

Viewpoint 12: Looking north-east from Hermitage Road, Cranley

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. While it is unlikely that there would be receptors in this location at night, this view is also representative of views from the Toowoomba Bypass at night, and interest in the transient views obtained at night is expected to be very low, even compared to daytime interest
Construction	
Magnitude of change assessment (construction)	▸ During construction, tunnel construction activities will occur 24-hours a day, 7-days a week ▸ Intermediate ventilation shaft construction site will be visible within this view, which will be lit with security lighting ▸ Current light levels are assumed to be 'predominately lit' and it is assumed that, the levels would remain 'predominantly lit' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 12 during construction is considered to be negligible
Operation	
Magnitude of change assessment (operation)	▸ Existing permanent road lighting associated with the Toowoomba Bypass–Mort Street Interchange is visible in this view ▸ In addition to this, there is also existing site security lighting associated with the Toowoomba Waste Management Centre (landfill), the Wetalla Wastewater Treatment Plant and industrial buildings in this area ▸ Lighting associated with residential properties within Highfields and Cranley are visible in this view ▸ Permanent lighting associated with the Toowoomba Range tunnel intermediate ventilation shaft and associated infrastructure will be visible in this view; however, it will blend somewhat into the existing setting ▸ The current light levels are assumed to be 'predominately lit' and it is assumed that, with careful planning, the levels would remain up to 'predominantly lit' representing a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 12 during operation is considered to be negligible

Viewpoint 13

TABLE 10.51 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 13

Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights

Visual evaluation	
Sensitivity assessment	▸ High as described for daytime assessment. There will be a relatively high number of residential receptors in this location at night with views towards the Project—residents of Blue Mountains Heights would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ During construction, it is anticipated that minimal works will be undertaken at night. However, the bridge construction laydown areas within this view would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 13 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the transient nature of impacts associated with train headlights and distance of sensitive receptors from the alignment in this location, it is considered that the impact would result in a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 13 during operation is considered to be up to low (as trains pass), noting that the impact is transient

Viewpoint 14

TABLE 10.52 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 14

Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights

Visual evaluation	
Sensitivity assessment	▸ High as described for daytime assessment. While it is considered unlikely that people will be accessing Katoomba Point Lookout at night, this view is also representative of views from nearby residents of Prince Henry Heights with elevated views over the Project
Construction	
Magnitude of change assessment (construction)	▸ During construction, it is anticipated that minimal works will be undertaken at night. However, the bridge construction laydown areas within this view would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 14 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ Due to the transient nature of impacts associated with train headlights and distance of sensitive receptors from the alignment in this location, it is considered that the impact would result in a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 14 during operation is considered to be up to low (as trains pass), noting that the impact is transient

Viewpoint 15

TABLE 10.53 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 15

Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville

Visual evaluation	
Sensitivity assessment	▸ High as described for daytime assessment. While it is considered unlikely that people will be accessing Picnic Point Lookout at night, this view is also representative of view from nearby residents of East Toowoomba and Rangeville with elevated views over the Project
Construction	
Magnitude of change assessment (construction)	▸ During construction, it is anticipated that minimal works will be undertaken at night. However, the bridge construction laydown areas within this view would be lit with security lighting ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 15 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ Due to the transient nature of impacts associated with train headlights and distance of sensitive receptors from the alignment in this location, it is considered that the impact would result in a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 15 during operation is considered to be up to low (as the trains pass), noting that the impact is transient

Viewpoint 16

TABLE 10.54 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 16

Viewpoint 16: Near 102–114 Jones Road, Ballard, looking north

Visual evaluation	
Sensitivity assessment	▸ Low sensitivity at night. Receptors in this location at night with close views towards the Project will be limited to isolated rural receptors
Construction	
Magnitude of change assessment (construction)	▸ During construction, it is anticipated that minimal works will be undertaken at night. However, the bridge construction laydown areas within this view would be lit with security lighting ▸ The current light levels are assumed to be 'intrinsically dark' and it is assumed that, the levels would be up to 'predominantly dark' representing a low magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 16 during construction is considered to be negligible
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ Due to the transient nature of impacts associated with train headlights, it is considered that the impact would result in a Negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 16 during operation is considered to be negligible (as the trains pass), noting that the impact is transient

Viewpoint 17

TABLE 10.55 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 17

Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west

Visual evaluation	
Sensitivity assessment	▸ Moderate as described for daytime assessment. However, somewhat fewer receptors are anticipated in this location at night as compared to the daytime view. Although travellers will still be passing along the Warrego Highway at night, their interest in the transient views obtained is expected to be low, even compared to daytime interest
Construction	
Magnitude of change assessment (construction)	▸ During construction, it is anticipated that minimal works will be undertaken at night, however, the bridge construction laydown areas within this view would be lit with security lighting ▸ The current light levels are assumed to be 'intrinsically dark' and it is assumed that, the levels would be up to 'predominantly dark' representing a low magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 17 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train that would last for a duration of up to 2.5 minutes ▸ Due to the transient nature of impacts associated with train headlights, it is considered that the impact would result in a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 17 during operation is considered to be up to low (as the trains pass), noting that the impact is transient

Viewpoint 18

TABLE 10.56 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 18

Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. Travellers passing along Murphys Creek Road and the Toowoomba Bypass at night, whose interest in the transient views obtained at night is expected to be very low, even compared to daytime interest
Construction	
Magnitude of change assessment (construction)	▸ Several bridge construction laydown areas will be visible within this view. These construction laydown areas would be lit with security lighting ▸ The current light levels are assumed to be 'intrinsically dark' and it is assumed that, with careful planning, the levels would remain up to 'intrinsically dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 18 during construction is considered to be low
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the provision of a crossing loop in this location, there may also be short-term impacts associated with the headlight of stationary trains using the crossing loop while other trains pass ▸ It is therefore considered that the impact would result in, at most, a low magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 18 during operation is considered to be up to low (as the trains pass or if a train is stationary in the crossing loop), noting that the impact is typically transient

Viewpoint 19

TABLE 10.57 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 19

Viewpoint 19: Near 730–737 Ashlands Drive, Helidon Spa, looking north

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. There will be isolated rural residential receptors in this location at night with close views towards the Project, in particular residents of Ashlands Drive, who would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ This viewpoint is in close proximity to a bridge construction laydown area will be possible from this location, which would be lit with security lighting ▸ However, it is anticipated that these views would be predominately screened by existing vegetation, and that no construction lighting will be associated with the general construction laydown area immediately to the north of the property shown within this view ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 19 during construction is considered to be negligible
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the transient nature of impacts associated with train headlights, it is considered that the impact would result in a negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 19 during operation is considered to be up to negligible (as the trains pass), noting that the impact is transient

Viewpoint 20

TABLE 10.58 LIKELY VISUAL EFFECT OF THE PROJECT LIGHTING ON VIEWPOINT 19

Viewpoint 20: Airforce Road, Helidon, looking west

Visual evaluation	
Sensitivity assessment	▸ Low as described for daytime assessment. There will be isolated rural residential receptors in this location at night with close views towards the Project, in particular residents of Airforce Road, Helidon Dip Road and Cattos Road, who would be the key night-time viewers
Construction	
Magnitude of change assessment (construction)	▸ This viewpoint is in close proximity to three laydown areas including a site office (on Airforce Road) and two bridge construction laydown areas situated on Cattos Road, however views to these laydown areas which would be lit with security lighting will be somewhat limited from this location. It is anticipated that views to construction lighting would, however, be possible from nearby isolated rural residential properties ▸ The current light levels are assumed to be 'predominately dark' and it is assumed that, with careful planning, the levels would remain up to 'predominantly dark' representing a negligible magnitude of change
Significance of effect (construction)	The effect of the Project lighting on Viewpoint 20 during construction is considered to be negligible
Operation	
Magnitude of change assessment (operation)	▸ No permanent lighting near this viewpoint ▸ There would be short-term impacts due to the headlight on the passing freight train which would last for a duration of up to 2.5 minutes ▸ Due to the transient nature of impacts associated with train headlights, it is considered that the impact would result in a Negligible magnitude of change
Significance of effect (operation)	The effect of the Project lighting on Viewpoint 20 during operation is considered to be up to negligible (as the trains pass), noting that the impact is transient

10.7 Mitigation

This section outlines the initial mitigation measures included in the Project design and identifies proposed mitigation measures to manage predicted environmental impacts in the pre-construction, construction and operational phases of the Project.

10.7.1 Initial mitigation—Design measures

The mitigation measures presented in Table 10.59 have been incorporated into the Project design. These design measures have been identified through collaborative development of the design and consideration of environmental constraints and issues, including proximity to sensitive receptors. These design measures are relevant to both the construction and operational phases of the Project.

TABLE 10.59 INITIAL MITIGATION MEASURES RELEVANT TO LANDSCAPE AND VISUAL AMENITY

Aspect	Initial mitigation measures
Landscape and visual issues	▸ The horizontal alignment of the Project has avoided direct impacts on nationally or regionally protected landscape areas such as the Lockyer National Park and Lockyer State Forest ▸ The design has been developed to use the existing rail corridor (around 5.6 km) to protect and minimise land severance and impacts to natural and rural landscapes to the greatest extent possible ▸ The corridor is within a tunnel (for around 6.2 km) that will minimise surface impacts and the intrusion of cut and fill on rural, forested and elevated landscapes associated with the Toowoomba Range ▸ The western and eastern tunnel portals are in cut, limiting direct views from surrounding receptors ▸ The Project is generally located within the proposed future rail corridor ▸ The Project has been aligned to be co-located with existing road infrastructure where possible ▸ The disturbance footprint defined in Project design has aimed to minimise vegetation clearing extents to that required to construct and operate the works ▸ The Project has minimised impacts on areas noted as being of regional landscape significance defined using the regionally significant scenic amenity methodology (*ShapingSEQ*) by tunnelling through these areas and locating it at the edge of these areas to the greatest extent possible ▸ The Project has sought to reduce the extent of impact on watercourses and their landscape setting ▸ The extent of cut and fill, including the height of structures and embankments, has been kept to a minimum, consistent with required engineering design and requirements for cross-corridor connectivity for people and vehicles ▸ The Project has been kept away from settlements to the greatest extent possible, albeit noting that complete avoidance is not possible through this settled and elevated landscape, specifically around the regional centre of Toowoomba

10.7.2 Proposed mitigation measures

To manage and mitigate impacts, a number of mitigation measures and design objectives are proposed for future stages of design and delivery to further reduce the significance of the initial impact rating. These proposed mitigation measures respond to Project-specific issues and opportunities, and address the requirements of legislation, accepted government plans, policy and practice.

Table 10.60 presents the proposed mitigation measures aligned with the Project phase they would be implemented in: detailed design, pre-construction, construction and commissioning, and operation.

These mitigation measures include Project-wide considerations as well as location or issue-specific measures in response to impacts identified in the LVIA.

TABLE 10.60 PROPOSED MITIGATION MEASURES RELEVANT TO LANDSCAPE AND VISUAL AMENITY

Delivery phase	Aspect	Proposed mitigation measures
Detailed design	Landscape and visual impacts due to the introduction of the Project	▸ Clearing extents of visually significant vegetation are further limited, where feasible, to that required to safely construct, operate and maintain the Project. Locations include: ▸ Gowrie Creek impacted by construction works associated with Gowrie Junction Road bridge (approximately Ch 2.0 km) ▸ Toowoomba Range and elevated undulating land near Ballard, Withcott and Postmans Ridge (approximately Ch 10.1 km to Ch 25.0 km), in particular with consideration of reducing the impact on the landscape character of LCT G: Forested Uplands and views towards this landscape from the Toowoomba Escarpment. ▸ Develop a Reinstatement and Rehabilitation Plan for areas within the disturbance footprint that do not form part of the permanent works (e.g. construction compounds, laydown areas, temporary access tracks etc). The plan will include and clearly identify: ▸ Location of areas subject to rehabilitation and/or reinstatement/stabilisation, in accordance with the landscape and rehabilitation design developed during detailed design. ▸ Objectives and timeframes for rehabilitation and/or reinstatement/stabilisation works (including the biodiversity, vegetation establishment and erosion and sediment control outcomes to be achieved): ▸ Where appropriate, how the objectives align with relevant recovery plans, threat abatement plans, conservation advices or policy guidance for target species in areas identified for rehabilitation ▸ Details of the actions and responsibilities to progressively rehabilitate, regenerate, and/or revegetate areas, consistent with the agreed objectives ▸ Rehabilitation requirements such as: – Milling and removal of bitumen pavement – Removal of any decommissioned culverts – Tyning and ripping of base and sub-base material – Application of soil ameliorants – Topsoiling and/or compost blanket – Stabilisation and rehabilitation (e.g. planting and or seeding) ▸ Native flora species endemic to the Darling Downs, Toowoomba and Lockyer regions or other suitable species appropriate to the landscape context and nursery/seed stock sources ▸ Consideration for maintenance or performance issues of rehabilitation e.g. vegetation that does not grow and obscure signals or impact the longevity of rail infrastructure ▸ Procedures, timeframes, measurable performance objectives and responsibilities for monitoring the success of rehabilitation and/or reinstatement/stabilisation areas. Corrective actions if the outcomes of rehabilitation or reinstatement/stabilisation are not achieved. A Reinstatement and Rehabilitation Management Plan will be developed to define post-construction maintenance requirements, monitoring requirements and completion criteria for areas defined in the landscape design or identified in the Reinstatement and Rehabilitation Plan, including identifying areas where degraded (eroded), bare or unstable (potentially erodible) soils need to be rehabilitated with consideration to the requirements of the DTMR Soil Management Manual (DTMR, 2020) and soil testing parameters and requirements as set out in Appendix of the manual.

Detailed design [continued]	Landscape and visual impacts on watercourses	▸ Develop the detailed design to minimise impacts to watercourses, riparian vegetation and in-stream flora and habitats. Particular locations (noting some of these include rail infrastructure already located on viaduct) include Gowrie Creek (LCA A1), Lockyer Creek (LCA A9) and Six Mile Creek (LCA A10).
	Visual impact of rail infrastructure	▸ Infrastructure (such as structures, embankments/cuttings, tunnel portals, tunnel control centre, viaducts and bridges) will be designed following an integrated design process with regard to landscape character and views as identified in the EIS seeking to: ▸ *Legacy:* Create consistent design treatments along the Inland Rail Program alignment to enhance the overall recognition and legacy of the Inland Rail Program ▸ *Viaducts and bridges:* Viaduct and bridge design considers appropriate design principles at key viewpoints, in particular at the following locations: – Gowrie Junction Road bridge (approximately Ch 2.0 km) – TSRC and Six Mile Creek viaduct (approximately Ch 15.8 km to Ch 16.9 km) – Murphys Creek Road viaduct (approximately Ch 25.6 km to Ch 26.0 km) ▸ *Embankments:* At locations where embankments are near roads and/or adjoin bridge structures, minimise the extent to which landform (embankments) restricts views or affects views from nearby residences, to the greatest extent possible, including through sensitive stabilisation, revegetation or, where appropriate, screen planting. These locations may include: – Draper Road – Paulsens Road (approximately Ch 0.6 km to Ch 1.4 km where residential properties are situated to the north of the Project) – Adjacent Toowoomba Bypass between Ch 19.6 km and Ch 20.8 km ▸ *Cuttings:* Minimise the extent of cut batters and undertake sensitive urban design of these to blend them into their landscape setting (for example considering potential for revegetation, rock pitching, etc.). In particular, with consideration of the following: – The approach to the eastern and western tunnel portals – Cuts within the vegetated and undulating land near Ballard, Withcott and Postmans Ridge (approximately Ch 10.1 km to Ch 22.0 km) that will be visible from a high number of receptors, including elevated scenic lookouts ▸ *Tunnels:* Consider cuts on the approach to tunnels as described above and give consideration to the detailed design of tunnel portals and the Toowoomba Range tunnel intermediate ventilation shaft location, including the provision of vegetation to screen views towards proposed infrastructure such as ventilation buildings, particularly the intermediate ventilation building with respect to its rural and industrial landscape context ▸ *Ventilation buildings:* Consider the urban design of the Toowoomba Range tunnel intermediate ventilation shaft location and associated buildings and design them to minimise the visual impact on the adjacent rural landscape and existing industrial area. ▸ *Noise barriers:* If required, minimise the use of noise barriers to the greatest extent possible. Where these are or may be required in the future, particularly in towns and urban areas, ensure they are designed sympathetically to their surroundings and consider CPTED and graffiti issues, where appropriate, considering the inclusion of community artwork and urban design. This strategy will be applied to any noise barriers required.

Detailed design [continued]	Landscape design treatments	▸ A Project landscape design will be prepared with landscaping treatments determined with reference to the key landscape characteristics and elements identified in the EIS with particular emphasis on sensitive design that is appropriate to the setting. The Project landscape design will also define appropriate treatments for areas subject to the Reinstatement and Rehabilitation Plan (or equivalent) and comply with the ARTC's *Section 17 Right of Way – Engineering Code of Practice* (ARTC 2013b): ▸ *Rural and natural landscapes:* The landscape design will respect and enhance the rural landscapes. Considerations include: – Design of the landscape earthworks and planting to screen and integrate the railway and associated structures and features, wherever practicable and appropriate, to the character and maintenance of desired views. This approach includes additional opportunities for design of targeted planting of buffer or shelter belts adjacent to major earthworks within the rail corridor, consistent with safety. For example, planting strips may be introduced adjacent to significant embankments to reduce visual impact and assist in integrating the landform into the existing landscape setting, which already include similar shelter belts beside roads and riparian vegetation along watercourses, in the following locations: • Adjacent to Gowrie Junction Road, Krienke Road, Morris Road, East Paulsens Road and the realigned Old Homebush Road (including adjacent the Gowrie Junction Road bridge), between approximately Ch 1.7 km to Ch 3.2 km to screen views to the Project from residential properties of Gowrie (to both the north and south of the Project) • Adjacent private residential properties on Ashlands Drive impacted by clearance associated with laydown area G2H-LDN023.80 ▸ The landscape design will seek to enhance the features and qualities that give the landscape its particular characteristic, ensuring the design responds to the natural patterns of the rural or natural landscape, in particular: ▸ Appropriate revegetation of disturbed areas between approximately Ch 10.1 km to Ch 25.0 km – Where appropriate, consult with local stakeholders and landowners during design (and construction) to understand the landscape context and the particular qualities of existing landscapes ▸ *Ecologically sensitive areas:* Design to provide opportunities for ecological gain to benefit biodiversity. This includes: – Development of diverse planting and seed mixes to maximise and connect habitat types for ecological gain – Enhancement of landscape corridors and ecological links across the landscape by, where possible, joining or re-joining fragmented areas of habitat – Landscape design and planting to incorporate ecological requirements to benefit the characteristic and visual amenity of local landscapes, including revegetation with locally Indigenous species ▸ *Heritage landscapes:* Through detailed design: – Seek to further limit direct impacts or impacts to the setting of identified items of Indigenous, historic or natural heritage significance including non-Indigenous heritage places (comprising local heritage places and other areas of interest as identified in Chapter 18: Cultural Heritage) and Indigenous Heritage places (to be identified through the Cultural Heritage Management Plans (CHMPs)). ▸ Consider the development of interpretation strategy and wayfinding to assist in the interpretation of visual elements of heritage significance such as old rail lines, bridges, buildings or other items of visual value.
	Visual impacts of lighting	▸ During detailed design, review assessment of the potential for operational light impacts to residents and identify if/where attenuation measures are required (such as receptors).

Preconstruction	Impacts to landscape and visual values	▸ Implement the relevant aspects of the Reinstatement and Rehabilitation Plan and progressively deliver to minimise disturbance to landscape and visual amenity values during and post the pre-construction period. ▸ Where feasible and practicable, construction areas including compounds, stockpiles, fuel storage, laydown areas and staff parking to be located outside the tree protection zone as defined in *AS4970-2009 Protection of trees on development sites* (Standards Australian, 2009b).

Construction and commissioning	Landscape and visual impacts due to vegetation removal	▸ Establish vegetation protection zones and project clearing extents prior to commencement of works to avoid impacts on adjoining vegetation and habitats as far as practicable, with particular consideration to:
		  ▸ Vegetation associated with the Toowoomba Range and elevated undulating land near Ballard, Withcott and Postmans Ridge (approximately Ch 10.1 km to Ch 25.0 km), in particular with consideration of reducing the impact on the landscape character of LCT G: Forested Uplands and views towards this landscape from the Toowoomba Escarpment
		  ▸ Vegetation within the footprint of laydown area G2H-LDN023.80 (retention of a buffer adjacent residential properties on Ashlands Drive).
		▸ Where feasible and practicable, construction areas including compounds, stockpiles, fuel storage, laydown areas and staff parking to be located outside the tree protection zone as defined in *AS4970-2009 Protection of trees on development sites* (Standards Australian, 2009b).

	Impacts to landscape and visual values	▸ Avoid or minimise locating construction compounds within close proximity to sensitive receptors to provide as much separation as possible. ▸ Minimise the height of all stockpiles to the greatest extent possible to reduce their visual impact; as well as maintain soil viability and avoid heat sterilisation of seed bank. ▸ Cover stockpiles with temporary vegetative cover (such as mulch, grass seeding/hyrdo-mulch, soil binder etc.). ▸ Temporary treatments (such as hoardings and shade-cloth screens) to site-compound fencing will be considered to assist in reducing visual impacts of temporary infrastructure and sun glare within close proximity of sensitive receptors. This may include art-based treatments to assist with screening the works from the public and using information boards (or similar) to inform the public about the construction works.
	Lighting impacts of construction activities	▸ Avoid or minimise unavoidable out of hours works (such as the Toowoomba Range tunnel construction) within close proximity to residences and, where construction light impacts are predicted, implement attenuation measures in discussion with potentially affected residents.
	Reinstatement and rehabilitation	▸ Implement the landscape design and the Reinstatement and Rehabilitation Plan and the relevant requirements of the Landscape and Rehabilitation Management Plan, including soil rehabilitation, monitoring and testing with consideration to the DTMR *Soil Management Manual*, until performance criteria are satisfactorily achieved.
Operation	Visual impact of disturbed areas	▸ As required, implement the relevant requirements of the Landscape and Rehabilitation Management Plan, until performance criteria are satisfactorily achieved and incorporate any specific ongoing management requirements into the Inland Rail Operation and Maintenance Management Plan.

10.7.3 Residual impact assessment

Potential impacts to landscape and visual amenity associated with the Project in the construction and operation phases are presented in Table 10.10 and Table 10.11. These impacts have been subjected to a significance assessment as per principles of the methodology detailed in Appendix H: Landscape and Visual Impact Assessment and as described further in Section 10.4.

The initial impact assessment is undertaken on the basis that the design measures (or initial mitigation) detailed in Table 10.59 have been incorporated into the Project design.

Proposed mitigation measures, described in Table 10.60, were then applied as appropriate to the phase of the Project to reduce the level of potential impact.

The residual risk level of the potential impacts was then reassessed after the proposed mitigation measures were applied. The initial significance levels were compared to the residual significance levels to assess the effectiveness of the proposed mitigation measures.

In conclusion, the Project was assessed as having impacts on landscape and visual values as described in Table 10.61. The proposed mitigation measures are anticipated to reduce impacts over time, for example as proposed vegetation matures, screening views of passing trains and integrating built infrastructure into the surrounding landscape.

TABLE 10.61 RESIDUAL IMPACT ASSESSMENT SUMMARY

				Initial Significance[1]		Residual Significance[2]	
Aspect	**Phase**	**Landscape Character Type/Viewpoint**	**Sensitivity**	**Magnitude**	**Significance**	**Magnitude**	**Significance**
Landscape impacts	Construction/ Operation	LCT A: Vegetated Watercourses—Creeks and Channels	Low	Moderate	Low	Low	Negligible
		LCT B: Irrigated Croplands	Low	Low	Negligible	Low	Negligible
		LCT C: Dry Croplands and Pastures	Low	High	Moderate	Moderate	Low
		LCT D: Vegetated Grazing	Low	High	Moderate	High	Moderate
		LCT E: Rural Settlement	Moderate	Moderate	Moderate	Moderate	Moderate
		LCT F: Rural Living	Moderate	Moderate	Moderate	Moderate	Moderate
		LCT G: Forested Uplands	High	High	Major	Moderate	High
		LCT H: Transitional Landscapes	No impact	No impact	No impact	No impact	No impact
Visual impacts	Construction	Viewpoint 1: Lenora Court, Gowrie Mountain, looking north-east	Moderate	Low	Low	Low	Low
		Viewpoint 2: Hilltop Drive Park, Gowrie, looking south-east towards Toowoomba	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 3: Charlton Pinch Road, Torrington, looking north-west over the Warrego Highway	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 4: Near 10 Paulsens Road, Gowrie, looking south-west towards Gowrie Junction Road bridge	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 5: Near 14 Junction Street, Gowrie, looking east towards western tunnel portal	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 6: Near 13–18 Treeline Drive, Gowrie, looking south	Moderate	Low	Low	Low	Low
		Viewpoint 7: 541–549 Ganzer Morris Road, looking east towards western tunnel portal	Low	Moderate	Low	Moderate	Low
		Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 9: Phoenix Street, Highfields looking south-west	Moderate	Low	Low	Low	Low
		Viewpoint 10: Old Goombungee Road, Birnam looking south towards Toowoomba	Low	Negligible	Negligible	Negligible	Negligible

				Initial Significance[1]		Residual Significance[2]	
Aspect	**Phase**	**Landscape Character Type/Viewpoint**	**Sensitivity**	**Magnitude**	**Significance**	**Magnitude**	**Significance**
Visual impacts	Construction [continued]	Viewpoint 11: Looking north from Baillie Henderson Hospital, Cranley	Moderate	Low	Low	Low	Low
		Viewpoint 12: Looking north-east from Hermitage Road, Cranley	Low	Moderate	Low	Moderate	Low
		Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights	High	Moderate	High	Moderate	High
		Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights	High	Moderate	High	Moderate	High
		Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville	High	Moderate	High	Moderate	High
		Viewpoint 16: Near 102–114 Jones Road, Ballard, looking north	Low	Moderate	Low	Moderate	Low
		Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west	Moderate	High	High	High	High
		Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 19: Near 730–737 Ashlands Drive, Helidon Spa, looking north	Low	High	Moderate	High	Moderate
		Viewpoint 20: Airforce Road, Helidon, looking west	Low	High	Moderate	High	Moderate
Visual impacts	Operation	Viewpoint 1: Lenora Court, Gowrie Mountain, looking north-east	Moderate	Moderate	Moderate	Low	Low
		Viewpoint 2: Hilltop Drive Park, Gowrie, looking south-east towards Toowoomba	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 3: Charlton Pinch Road, Torrington, looking north-west over the Warrego Highway	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 4: Near 10 Paulsens Road, Gowrie, looking south-west towards Gowrie Junction Road bridge	Moderate	High	High	High	High
		Viewpoint 5: Near 14 Junction Street, Gowrie, looking east towards western tunnel portal	Moderate	High	High	Moderate	Moderate
		Viewpoint 6: Near 13–18 Treeline Drive, Gowrie, looking south	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 7: 541–549 Ganzer Morris Road, looking east towards western tunnel portal	Low	High	Moderate	Moderate	Low
		Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass	Moderate	Moderate	Moderate	Low	Low

				Initial Significance[1]		Residual Significance[2]	
Aspect	**Phase**	**Landscape Character Type/Viewpoint**	**Sensitivity**	**Magnitude**	**Significance**	**Magnitude**	**Significance**
Visual impacts	Operation [continued]	Viewpoint 9: Phoenix Street, Highfields looking south-west	Moderate	Low	Low	Negligible	Negligible
		Viewpoint 10: Old Goombungee Road, Birnam looking south towards Toowoomba	Low	Low	Negligible	Low	Negligible
		Viewpoint 11: Looking north from Baillie Henderson Hospital, Cranley	Moderate	Low	Low	Low	Low
		Viewpoint 12: Looking north-east from Hermitage Road, Cranley	Low	Moderate	Low	Moderate	Low
		Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights	High	Moderate	High	Moderate	High
		Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights	High	Moderate	High	Moderate	High
		Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville	High	Moderate	High	Moderate	High
		Viewpoint 16: Near 102–114 Jones Road, Ballard, looking north	Low	High	Moderate	High	Moderate
		Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west	Moderate	High	High	High	High
		Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north	Moderate	High	High	High	High
		Viewpoint 19: Near 730–737 Ashlands Drive, Helidon Spa, looking north	Low	High	Moderate	Moderate	Low
		Viewpoint 20: Airforce Road, Helidon, looking west	Low	High	Moderate	High	Moderate
Lighting impacts	Construction	Viewpoint 1: Lenora Court, Gowrie Mountain, looking north-east	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 2: Hilltop Drive Park, Gowrie, looking south-east towards Toowoomba	Moderate	Low	Low	Low	Low
		Viewpoint 3: Charlton Pinch Road, Torrington, looking north-west over the Warrego Highway	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 4: Near 10 Paulsens Road, Gowrie, looking south-west towards Gowrie Junction Road bridge	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 5: Near 14 Junction Street, Gowrie, looking east towards western tunnel portal	Moderate	Low	Low	Low	Low

				Initial Significance[1]		Residual Significance[2]	
Aspect	**Phase**	**Landscape Character Type/Viewpoint**	**Sensitivity**	**Magnitude**	**Significance**	**Magnitude**	**Significance**
Lighting impacts	Construction [continued]	Viewpoint 6: Near 13–18 Treeline Drive, Gowrie, looking south	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 7: 541–549 Ganzer Morris Road, looking east towards western tunnel portal	Low	Moderate	Low	Moderate	Low
		Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass	Moderate	Moderate	Moderate	Moderate	Moderate
		Viewpoint 9: Phoenix Street, Highfields looking south-west	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 10: Old Goombungee Road, Birnam looking south towards Toowoomba	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 11: Looking north from Baillie Henderson Hospital, Cranley	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 12: Looking north-east from Hermitage Road, Cranley	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights	High	Negligible	Low	Negligible	Low
		Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights	High	Negligible	Low	Negligible	Low
		Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville	High	Negligible	Low	Negligible	Low
		Viewpoint 16: Near 102–114 Jones Road, Ballard, looking north	Low	Low	Negligible	Low	Negligible
		Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west	Moderate	Low	Low	Moderate	Low
		Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 19: Near 730–737 Ashlands Drive, Helidon Spa, looking north	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 20: Airforce Road, Helidon, looking west	Low	Negligible	Negligible	Negligible	Negligible

				Initial Significance[1]		Residual Significance[2]	
Aspect	**Phase**	**Landscape Character Type/Viewpoint**	**Sensitivity**	**Magnitude**	**Significance**	**Magnitude**	**Significance**
Lighting impacts	Operation	Viewpoint 1: Lenora Court, Gowrie Mountain, looking north-east	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 2: Hilltop Drive Park, Gowrie, looking south-east towards Toowoomba	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 3: Charlton Pinch Road, Torrington, looking north-west over the Warrego Highway	Low	Negligible	Negligible	No impact	Negligible
		Viewpoint 4: Near 10 Paulsens Road, Gowrie, looking south-west towards Gowrie Junction Road bridge	Moderate	Low	Low	Low	Low
		Viewpoint 5: Near 14 Junction Street, Gowrie, looking east towards western tunnel portal	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 6: Near 13–18 Treeline Drive, Gowrie, looking south	Moderate	Low	Low	Low	Low
		Viewpoint 7: 541–549 Ganzer Morris Road, looking east towards western tunnel portal	Low	Low	Negligible	Low	Negligible
		Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass	Moderate	Low	Low	Low	Low
		Viewpoint 9: Phoenix Street, Highfields looking south-west	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 10: Old Goombungee Road, Birnam looking south towards Toowoomba	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 11: Looking north from Baillie Henderson Hospital, Cranley	Moderate	Negligible	Low	Negligible	Low
		Viewpoint 12: Looking north-east from Hermitage Road, Cranley	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights	High	Negligible	Low	Negligible	Low
		Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights	High	Negligible	Low	Negligible	Low
		Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville	High	Negligible	Low	Negligible	Low
		Viewpoint 16: Near 102–114 Jones Road, Ballard, looking north	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west	Moderate	Negligible	Low	Negligible	Low

				Initial Significance[1]		Residual Significance[2]	
Aspect	**Phase**	**Landscape Character Type/Viewpoint**	**Sensitivity**	**Magnitude**	**Significance**	**Magnitude**	**Significance**
Lighting impacts	Operation [continued]	Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north	Moderate	Low	Low	Low	Low
		Viewpoint 19: Near 730–737 Ashlands Drive, Helidon Spa, looking north	Low	Negligible	Negligible	Negligible	Negligible
		Viewpoint 20: Airforce Road, Helidon, looking west	Low	Negligible	Negligible	Negligible	Negligible

Table notes:

1 Includes implementation of initial mitigation measures specified in Table 10.59
2 Includes implementation of additional mitigation measures and controls as identified in Table 10.60

10.8 Cumulative impacts

Cumulative impacts are those that result from the successive, incremental and or combined effects of an action, project or activity when added to other existing, planned and or reasonably anticipated future ones (World Bank International Finance Corporation, 2013).

The cumulative LVIA is based on descriptions of other similar scale projects to the extent that such data was publicly available at the time of this assessment. The cumulative situation may change as applications for projects or developments are made or withdrawn.

A provisional review has been conducted to streamline the assessment process to eliminate, or scope out projects that are anticipated to generate negligible landscape and visual impacts. Due to the potential for sequential impacts, for example when driving through the landscape, a wider cumulative impacts study area, broader than the LVIA study area, was considered, extending by a distance of 50 km (approximately 30 minutes' drive or more from the Project alignment), which aligns with the cumulative impacts study area defined in Chapter 22: Cumulative Impacts. Beyond this distance, it is considered that there would be no reasonable expectation of cumulative impact being registered by a viewer.

Based on this assessment, the projects that are considered to have potential cumulative landscape and visual impacts are detailed in Table 10.62.

TABLE 10.62 PROJECTS INCLUDED IN THE LANDSCAPE AND VISUAL IMPACT ASSESSMENT CUMULATIVE IMPACT ASSESSMENT

Project and Proponent	Location	Description	Project status	Lifespan (years)	Relationship to the Project (G2H)
Calvert to Kagaru (C2K) (ARTC)	Rail alignment from Calvert to Kagaru	53 km greenfield single-track, dual-gauge freight rail line as part of the ARTC Inland Rail Program	Draft EIS being prepared by ARTC	>50 years	Potential overlap of construction finalisation for C2K and commencement of construction for the Project
NSW/Queensland Border to Gowrie (B2G) (ARTC)	NSW/Queensland Border to Gowrie	Comprised of approximately 146 km of new dual-gauge track and 78 km of upgraded track from the NSW/Queensland border, near Yelarbon, to Gowrie, north-west of Toowoomba in Queensland	Draft EIS being prepared by ARTC	>50 years	Potential overlap on construction commencement for B2G and finalisation of construction for the Project. The projects adjoin (and LVIA study areas overlap) so there is the potential for cumulative landscape and visual effects
Helidon to Calvert (H2C) (ARTC)	Rail alignment from Helidon Calvert	53 km new dual-gauge rail corridor approximately 60 m wide, containing a single-track, dual-gauge rail line with up to four crossing loops. Ancillary works including road and public utility crossings and alignments	Draft EIS being prepared by ARTC	>50 years	Potential overlap on construction commencement for H2C and finalisation of construction for the Project. The projects adjoin (and LVIA study areas overlap) so there is the potential for cumulative landscape and visual effects
Asterion Medicinal Cannabis Facility	Wellcamp	The Asterion Medicinal Cannabis Facility is a high-tech medicinal cannabis cultivation, research and manufacturing facility. The project covers 51 ha and involves construction of a 40 ha glasshouse. It is located immediately to the east of Project rail alignment and west of the Wellcamp Business Park	DA recently approved by TRC	2020–2021	South-west of the Project rail alignment and west of the Wellcamp Business Park. Potential for combined, successive and sequential visual impacts during operation
Yarranlea Solar (Risen Energy)	Yarranlea	Yarranlea Solar Farm will be developed in four stages on up to 250 ha approximately 50 km west of Toowoomba. Once completed, the Project will have a generation capacity of up to 100 megawatts (MW)	Under construction	Ongoing	Around 40 km to the south-west of the Project
Defence Housing Australia (DHA) Mount Lofty Development	Mount Lofty	The development of 342 residential lots, sized from 400 square metres (m2) to 4,000 m2, on a 52 ha section of the former rifle range site at Mount Lofty	Development Application and EPBC Act Referral Lodged 2018 (development on hold)	Unknown	Around 1.7 km to the south of the Project

Project and Proponent	Location	Description	Project status	Lifespan (years)	Relationship to the Project (G2H)
Pittsworth Industrial Precinct Enabling Project (TRC/Queensland Government)	Pittsworth	New road and sewerage infrastructure at Pittsworth Industrial Precinct to open up industrial land for industries servicing agriculture and the wider region	Under construction	Ongoing	Around 34 km to the south-west of the Project
Toowoomba Wellcamp Airport (Wagner Corporation)	Wellcamp, approximately 10 km west of Toowoomba	The airport operates as an international cargo hub connecting Australia's leading primary producers and processors with growing consumer markets across the globe. The airport was constructed over 19 months from 2012 to 2014 and is the first major greenfield public airport development in Australia in over 50 years (Wagner Corporation, 2018)	Operational with expansion proposed	Ongoing	Around 8.5 km south-west of the Project
Wellcamp Business Park (Wagner Corporation)	Wellcamp, approximately 15 km west of Toowoomba	Wellcamp Business Park incorporating Toowoomba Wellcamp Airport is proposed as the business hub of Toowoomba and regional Queensland. With an aviation, logistics, transport, corporate and mining services focus	Operational with expansion proposed	Ongoing	Around 7 km south-west of the Project
Witmack Industry Park (FKG Group)	Near Charlton, approximately 10 km west of Toowoomba	Logistics and warehouse park (part of Toowoomba Enterprise Hub)	Operational with expansion proposed	Ongoing	Around 4 km south-east of the Project
Charlton Logistics Park (FKG Group)	Near Charlton, approximately 10 km west of Toowoomba	Logistics and warehouse park (part of Toowoomba Enterprise Hub)	Operational with expansion proposed	Ongoing	Around 3 km south of the Project
InterLinkSQ—Global Logistics Centre (InterLinkSQ)	13 km west of Toowoomba and (located 8 km from Wellcamp International Airport)	200 ha of new transport, logistics and business hubs. Located on the narrow-gauge regional rail network and interstate network. Located to the north of the junction of the Gore and Toowoomba Bypass/Warrego Highways and within easy accessibility of the New England Highway	Yet to commence construction	2017–2037	Overlaps and adjoins the Project at Drapers Road, Gowrie. Ongoing development could require deconfliction of construction resources. There may also be an increase of heavy vehicles using the surrounding highways. Potential for operational visual impacts

Project and Proponent	Location	Description	Project status	Lifespan (years)	Relationship to the Project (G2H)
New Acland Coal Mine Stage 3—New Acland Coal Pty Ltd (New Hope Corporation Limited)	35 km north-west of Toowoomba	Expansion of the existing New Acland open-cut coal mine to up to 7.5 million tonnes per annum	EIS approved with conditions, December 2014	Sequential development of resource areas expected to extend coal production until 2042	Ongoing development could require deconfliction of construction resources. There may also be an increase of heavy vehicles using the surrounding highways

Cumulative impacts to the landscape and visual amenity associated with the Project will be largely the product of:

- Temporal construction impacts—presence of construction traffic, workforce and machinery operating on adjoining projects at the same time
- Spatial operational impacts—the residual impact of the visibility of infrastructure of identified projects to sensitive receptors and also including as a result of the introduction of additional visual receptors (including residential receptors) into an area and with potential to view the Project.

In terms of temporal (construction) impacts, it appears likely that the C2K, B2G and H2C projects would have some overlap in construction periods. In addition, ongoing growth and expansion of Toowoomba Wellcamp Airport, Wellcamp Business Park, Asterion Medicinal Cannabis Facility, Witmack Industry Park, InterLinkSQ, Charlton Logistics Park and ongoing mining at the New Acland Coal Mine may result in some temporal overlap. Collectively, these projects have the potential to result in the perception of relatively high amounts of construction activity and ongoing views of the movement of heavy vehicles and plant within the cumulative impacts study area.

The areas of the adjoining B2G project most likely to be affected by the perception of this cumulative construction activity are the Warrego Highway, Toowoomba Bypass, Toowoomba Connection Road, New England Highway, Millmerran-Inglewood Road and the Gore Highway within the LVIA study area, with the greatest activity centred on Toowoomba. As large vehicles on these key roads would not be unexpected from a visual perspective and the construction impacts are temporary, the consequence of this cumulative impact during construction in the LVIA study area is low.

In terms of the spatial (operational) impacts of other linear transport infrastructure projects, the B2G and H2C projects immediately adjoin the Project and the recently constructed Toowoomba Bypass is also located very close to many parts of the Project, particularly in the east of the cumulative impacts study area. Consequently, some receptors will experience views of both B2G and the Project, or H2C and the Project, but the Project will, in practice, be viewed as part of the same integrated project (Inland Rail). With regards to the Toowoomba Bypass, some receptors will experience views of both the Project and the Toowoomba Bypass which intensifies the impact of infrastructure on the landscape of the LVIA study area, particularly to the east and west of Toowoomba. The tunnelling component of the Project minimises this cumulative impact for part of this alignment since the Project will be hidden from view through much of the tunneled section. Overall, the cumulative impacts of these linear infrastructure projects are considered to be an impact of medium consequence.

The cumulative impact of the DHA Mount Lofty Development is largely that it will bring additional visual receptors into the elevated landscape to the north-east of Toowoomba and will also potentially affect views from existing residents located in this part of the city. With regards to the other land development projects, InterLinkSQ, Toowoomba Wellcamp Airport, Wellcamp Business Park, Asterion Medicinal Cannabis Facility and the Toowoomba Enterprise Hub (Charlton and Logistics Park and Witmack Industry Park) lie close to the Project. Consequently, there would be potential for combined, successive and sequential impacts from these projects, resulting in the perception of development intensification, particularly in the west of the LVIA study area in the general area around Gowrie Mountain with potential impacts of up to medium consequence. Other projects including the New Acland Mine, Gatton West Industrial Zone and Yarranlea Solar Park are at greater distance and lie closer to other Inland Rail projects so cumulative impacts are considered less likely.

Mitigation to address these identified cumulative impacts will generally be those measures as described for the Project and other Inland Rail projects. Localised enhancements, for example buffer planting, may enhance outcomes and minimise localised impacts on particular receptors.

Due to the low level of lighting proposed for the Project, there are not anticipated to be any significant cumulative lighting impacts associated with these projects.

Overall, the cumulative landscape and visual impact assessment in the region is likely to be up to medium consequence. This is summarised in Table 10.63.

TABLE 10.63 PROJECT INCLUSION CRITERIA—CUMULATIVE IMPACT ASSESSMENT

Residual cumulative landscape and visual impact	Consequence
Construction impacts associated with increase in views of construction traffic and construction areas	Low
Operation impacts associated with views of combined, successive and sequential views of adjoining projects	(up to) Medium
Impacts of night lighting	Nil

10.9 Conclusions

The landscape between Gowrie and Helidon is highly varied, comprising irrigated agriculture and dry croplands and pastures interspersed with a network of creeks on the Toowoomba Plateau, and densely vegetated landscapes associated with the Great Dividing Range and Lockyer National Park to the north-east. An existing operational West Moreton System rail corridor is present in parts of the LVIA study area, facilitating both freight and passenger train movements.

The Project would introduce 28 km of new rail into the landscape, of which 5.6 km would be co-located with the existing West Moreton System rail corridor, with an additional 6.24 km in tunnel.

The key landscape and visual impacts of the Project relate to the removal of vegetation, the raising of embankments and creation of new rail bridges and viaducts.

Eight LCTs have been identified, of which seven are potentially affected by the Project. Impacts of up to Major significance were identified for one LCT, LCT G: Forested Uplands, associated with the introduction of highly evident viaduct structures, extensive cut and fill, tunnelling and vegetation clearance within the forested landscapes of the Great Dividing Range east of Toowoomba, that are recognised for their high scenic amenity value.

For part of the LVIA study area, there are relatively few visual receptors with the landscape comprising isolated homesteads set on large private farms or rural blocks. However, the landscape around Toowoomba is quite densely settled with numerous settlements located within the potential viewshed of the Project including Gowrie Mountain, Gowrie, Kingsthorpe and other suburbs to the north and east of Toowoomba. The Project also traverses within close proximity to the residential areas of Withcott, Postmans Ridge, Helidon Spa and Helidon. Visual impacts are typically contained by the presence of vegetation, including along creek lines, and localised undulations in landform. Visual impacts are also contained through the use of a tunnel for a significant length of the Project. Elevated and panoramic views over the Project are also available from the edge of Toowoomba and the Forested Uplands associated with the Toowoomba Range, scenic lookouts, walking trails within public parks including Jubilee Park, Redwood Park, and Picnic Point Parklands and residential properties with views towards the Project as well as from parts of the Toowoomba Bypass.

As part of the visual assessment, 20 representative viewpoints were selected and assessed for both construction and operation phases of the Project. During construction, the greatest visual impact identified was up to High significance, relating to three viewpoints: Viewpoint 13: Keira Court, Blue Mountain Heights looking south-east; Viewpoint 14: Katoomba Point Lookout, Prince Henry Heights looking north; and Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville.

For visual impacts during operation, seven visual impacts of up to High significance were identified. These are associated with Viewpoint 4: Near 10 Paulsens Road, Gowrie, looking south-west towards Gowrie Junction Road bridge; Viewpoint 5: Near 14 Junction Street, Gowrie, looking east towards western tunnel portal; Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights; Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights; Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville; Viewpoint 17: Warrego Highway near Gittins Road, Postmans Ridge, looking west; and Viewpoint 18: Murphys Creek Road near Toowoomba Bypass, looking north. These impacts relate to elevated views from significant locations over the wider Project or viewpoints situated in close proximity to the Project. Other visual impacts during both construction and operation are of lower significance, typically relating to views experienced by relatively small numbers of homesteads or with a lower magnitude of change to the existing view.

Three viewpoints will experience visual impacts of up to High significance during both construction and operations: Viewpoint 13: Looking south-east from Keira Court, Blue Mountain Heights; Viewpoint 14: Looking north from Katoomba Point Lookout on Prince Henry Drive, Prince Henry Heights; Viewpoint 15: Looking north-east from Picnic Point Lookout within Picnic Point Parklands, Rangeville. These viewpoints are located on top of the Great Dividing Range overlooking Lockyer Valley, where the Project is predominantly located.

For lighting impacts, the most significant effect during construction is up to Moderate for Viewpoint 8: Looking west from Boundary Street bridge over the Toowoomba Bypass, the greatest impact identified during operation is up to Low significance for 13 viewpoints.

Cumulative impacts, particularly the effects in combination with the adjoining B2G and H2C projects have been considered. Cumulative impacts during both construction and operation are up to medium consequence, due to the potential for localised areas (particularly the area around Gowrie Mountain in the west of the Project) to be affected by multiple infrastructure and building projects, dependent upon project phasing. There are no identified cumulative impacts associated with night lighting.

ARTC will develop a Reinstatement and Rehabilitation Management Plan and a Landscape and Rehabilitation Management Plan that will include landscape objectives and principles, as well as outline landscape and rehabilitation treatments for various phases of the Project. These will include reference to the mitigation measures described in Section 10.7 that will reduce the residual impact for some of the identified effects on landscape and visual values.