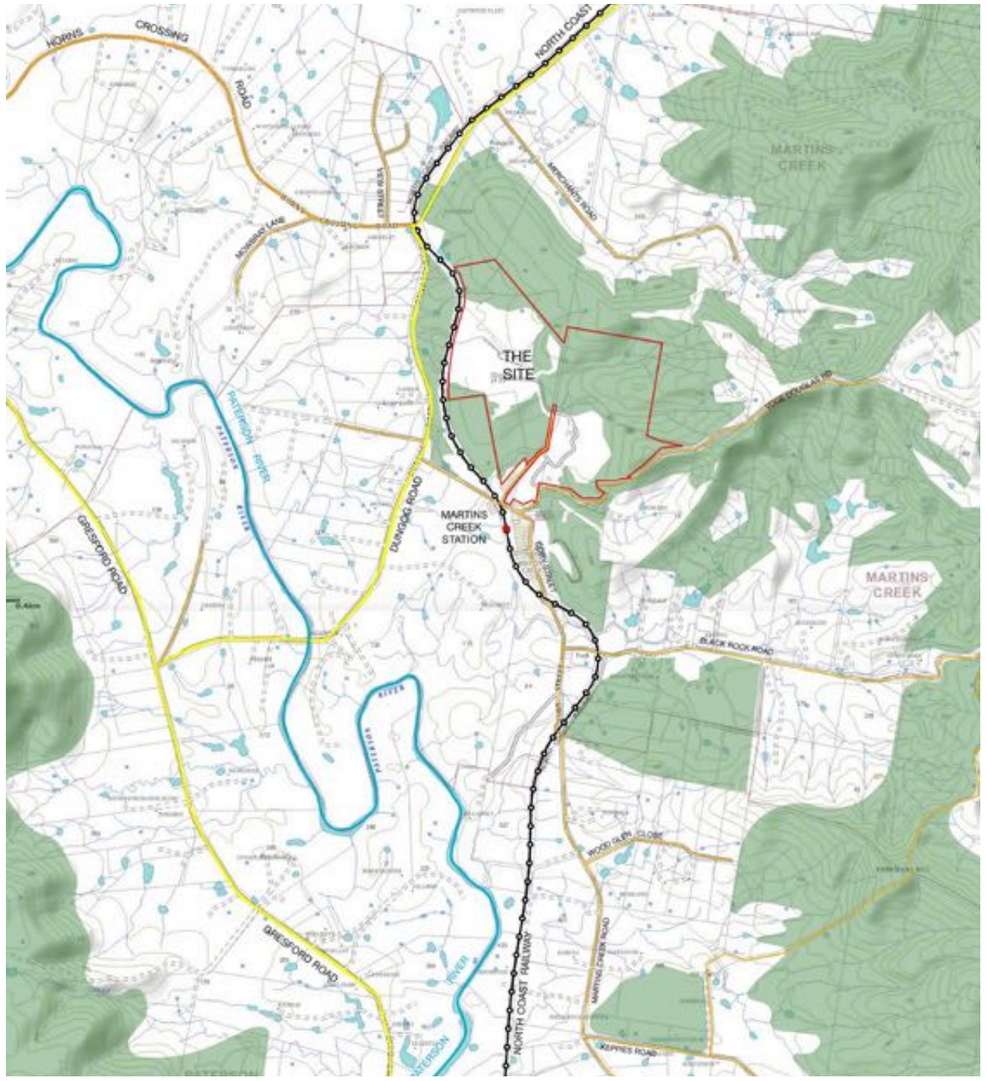
Landscape & Visual Impact Assessment



PROPOSED MARTINS CREEK QUARRY EXPANSION

moir landscape architecture

88 Fern Street | PO Box 111 Islington NSW 2296
P | 02 4965 3500 F | 02 4965 3555
admin@moirlandscapearchitecture.com.au
www.moirlandscapearchitecture.com.au

Prepared for: **DARACON**

Project No: **1149**

Issue: **REV A**

Date: **04.05.16**

Contents

1.0 Introduction

1.1 Background

Moir Landscape Architecture have been commissioned by Daracon Group to prepare a Landscape and Visual Impact Assessment (LVIA) for the proposed extension of the existing Quarry at Martins Creek, NSW (Refer to **Figure 1**). The LVIA has been prepared with regard to Dungog Shire Council's (DSC) relevant guidelines.

As cadastral information has little influence in defining visual catchments this assessment aims to identify the landscape character, and dominant features of the relevant visual catchments that The Site lies within. The purpose of this report is to provide a qualitative and quantitative assessment of the visibility and potential visual impacts of the Proposal.

Field work for the study was undertaken during February 2015 using key viewpoints and locations with potential views towards The Site. The report details the results of the field work, documents the assessment of the landscape character and visual setting, and potential visual impacts.

The report also provides detailed recommendations for the mitigation of determined impacts. This information is provided to assist the Department of Planning and Infrastructure (DP&I) and Council in understanding the likely impacts and how they may be managed to ensure that the positive character elements of the Martins Creek visual landscape are not overly eroded or diminished.

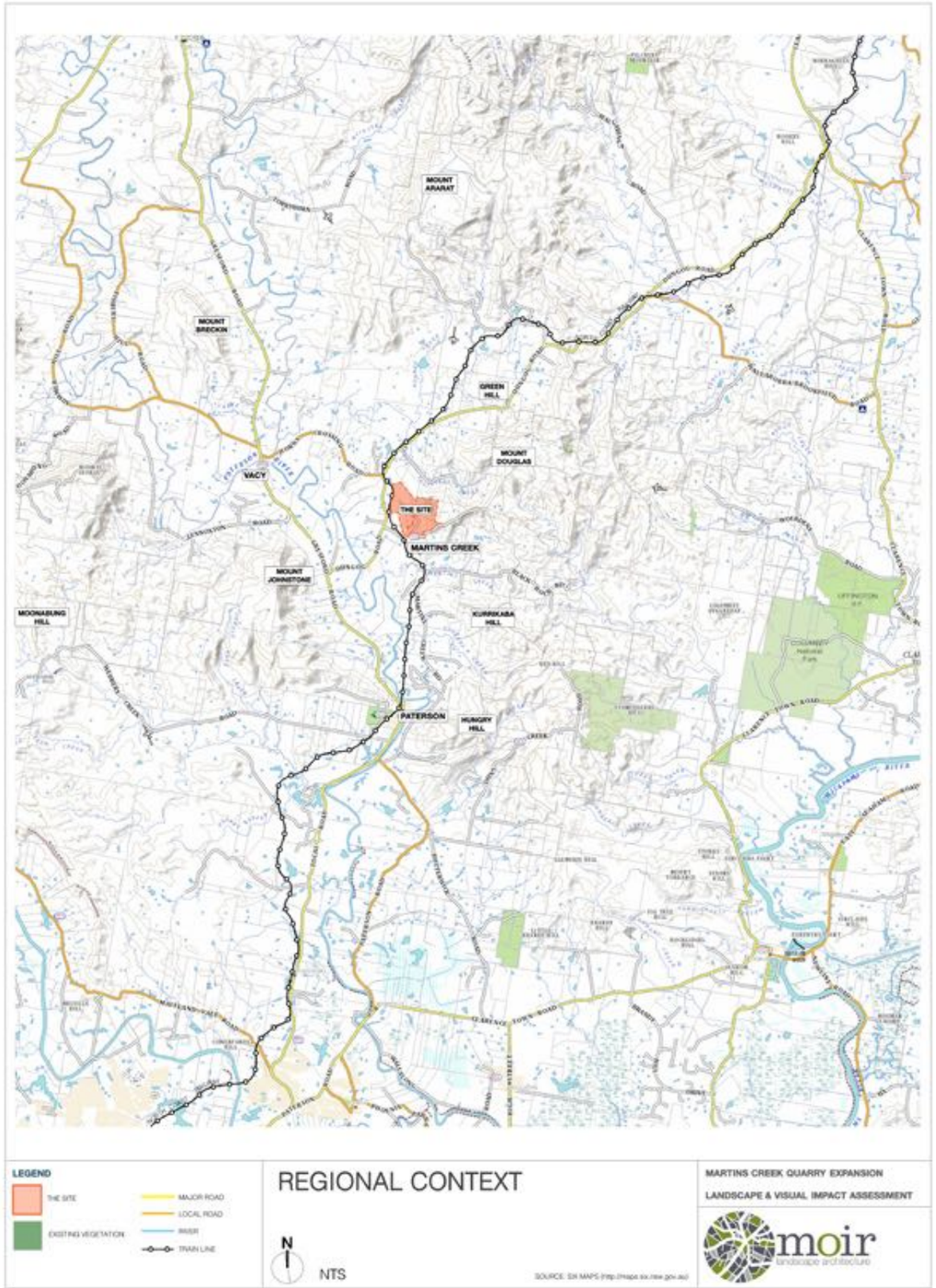


FIGURE 1: Regional Context.

2.0 Study Method

2.1 Landscape and Visual Impact Assessment

A Landscape Assessment and Visual Impact Assessment is used to identify and determine the value, significance and sensitivity of a landscape. The method applied to this study involved systematically evaluating the visual environment pertaining to the site and using value judgements based on community responses to scenery. The assessment was undertaken in stages as noted below:

The process involves:

- Classification of the landscape into different character types and a description of those types. These are referred to as Landscape Character Units (LCU).
- Objective assessment of the relative aesthetic value of the landscape, defined as Visual Quality and expressed as high, medium or low. This assessment generally relates to variety, uniqueness, prominence and naturalness of the landform, vegetation and water forms within each character type or LCU.
- Determination of the landscapes ability to absorb different types of development on the basis of physical and environmental character.
- An assessment of viewer sensitivity to change. This includes how different groups of people view the landscape (for example, a resident as opposed to a tourist), and how many people are viewing and from how far.
- The undertaking of a viewpoint analysis to identify areas likely to be affected by development of The Site and a photographic survey using a digital camera and a handheld GPS unit to record position and altitude.
- An assessment of visual impacts; and the preparation of recommendations for impact mitigation and suggestions for suitable development patterns that would maintain the areas visual quality.

The purpose of the above methodology is to reduce the amount of subjectivity entering into visual impact assessment and to provide sufficient data to allow for third party verification of results.

The second stage of the assessment involves a quantitative approach. The quantification of the visual impacts is defined by methods including:

- Digital terrain modelling for The Site and its surrounds.
- View shed analysis to determine visibility of the Proposal.
- Preparation of survey accurate photomontages depicting the Proposal and mitigation measures.

2.2 Definitions

Definitions for terms used throughout the VIA have been included in this section of the report.

2.2.1 Landscape Values

Landscape values are the cultural attributes (social, indigenous, artistic and environmental) as well as the aesthetics of a place, as shown in figure 2.

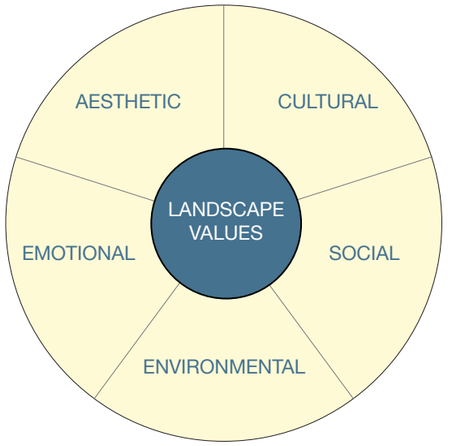


FIGURE 2: Landscape Values.

2.2.2 Visual Quality

Visual quality of an area is essentially an assessment of how viewers may respond to designated scenery. Scenes of high visual quality are those which are valued by a community for the enjoyment and improved amenity they can create. Conversely, scenes of low visual quality are of little value to the community with a preference that they be changed and improved, often through the introduction of landscape treatments.

As visual quality relates to aesthetics its assessment is largely subjective. There is evidence to suggest that certain landscapes are constantly preferred over others with preferences related to the presence or absence of certain elements. The rating of visual quality for this study has been based on scenic quality ratings and on the following generally accepted assumptions arising from scientific research (DOP, 1988):

- visual quality increases as relative relief and topographic ruggedness increases;
- visual quality increases as vegetation pattern variations increase;
- visual quality increases due to the presence of natural and/or agricultural landscapes;
- visual quality increases owing to the presence of water forms (without becoming too common) and related to water quality and associated activity; and
- visual quality increases with increases in land use compatibility.
- In addition to the above, cultural items may also endow a distinct character to an area and therefore contribute to its visual quality due to nostalgic associations and the desire to preserve items of heritage significance.

2.0 Study Method (contd.)

In addition to the before mentioned, cultural items may also endow a distinct character to an area and therefore contribute to its visual quality due to nostalgic associations and the desire to preserve items of heritage significance.

2.2.3 Visual Sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different areas. The assessment is based on the number of people affected, land use, and the distance of the viewer from the proposal. (EDAW, 2000).

For example, a significant change that is not frequently seen may result in a low visual sensitivity although its impact on a landscape may be high. Generally the following principles apply:

- Visual sensitivity decreases as the viewer distance increases.
- Visual sensitivity decreases as the viewing time decreases.
- Visual sensitivity can also be related to viewer activity (eg. a person viewing an affected site whilst engaged in recreational activities will be more strongly affected by change than someone passing a scene in a car travelling to a desired destination).

Sensitivity ratings are defined as high, moderate or low and are shown in the table below (Adapted from EDAW, 2000).

VISUAL SENSITIVITY					
LAND USE	DISTANCE ZONES				
	FOREGROUND		MIDDLE GROUND		BACKGROUND
	0-1	1-2km	2-4.5	4.5-7	> 7kms
Tourist / Recreation	High	High	High	Mod	Low
Residential: Rural or Urban	High	High	High	Mod	Low
Main Travel Corridor	Mod	Mod	Low	Low	Low
Minor / Local Roads	Mod	Mod	Low	Low	Low
Railway Line (Freight)	Low	Low	Low	Low	Low
Industrial Areas	Low	Low	Low	Low	Low

TABLE 1: Visual Sensitivity Table.

2.2.4 Visual Effect

Visual effect is the interaction between a proposal and the existing visual environment. It is often expressed as the level of visual contrast of the proposal against its setting or background in which it is viewed.

Low visual effect: occurs when a proposal blends in with its existing viewed landscape due to a high level of integration of one or several of the following: form, shape, pattern, line, texture or colour. It can also result from the use of effective screening often using a combination of landform and landscaping.

Moderate visual effect: occurs where a proposal is visible and contrasts with its viewed landscape however, there has been some degree of integration (eg. good siting principles employed, retention of significant existing vegetation, provision of screen landscaping, appropriate colour selection and/or suitably scaled development).

High visual effect: results when a proposal has a high visual contrast to the surrounding landscape with little or no natural screening or integration created by vegetation or topography.

2.2.5 Visual Impact

Visual impact is the combined effect of visual sensitivity and visual effect. Various combinations of visual sensitivity and visual effect will result in high, moderate and low overall visual impacts as suggested in the below table (URBIS, 2009).

VISUAL IMPACT				
		VISUAL EFFECT ZONES		
		HIGH	MODERATE	LOW
VISUAL SENSITIVITY LEVELS	HIGH	High Impact	High Impact	Moderate Impact
	MODERATE	High Impact	Moderate Impact	Low Impact
	LOW	Moderate Impact	Low Impact	Low Impact

TABLE 2: Visual Impact Table.

2.2.6 Landscape Quality Rating

The landscape quality for each Landscape Character Unit (refer to **Section 4.2**) has been rated using **Table 3.** As visual quality relates to aesthetics its assessment is largely subjective. There is evidence to suggest that certain landscapes are constantly preferred over others with preferences related to the presence or absence of certain elements.

The table below was utilised to determine the landscape quality of each Landscape Character Unit.

LANDSCAPE QUALITY RATING TABLE

		LANDSCAPE QUALITY RATING	
		VERY LOW ← LOW MODERATE HIGH → VERY HIGH	
LANDSCAPE CHARACTER	Topography/ Landscape Features	- Flat Topography - Absence of Landscape Features - Absence of Water - Open, broad extents of spaces	- Diversity in Topographical Range - Unique Landscape Features - Presence of Water - Intimate spaces
	Vegetation	- Absence of vegetation - Lack of diversity - Land cleared of endemic vegetation - Low level of connection between vegetation and landscape/topography	- Abundant vegetation - High diversity - High retention of endemic vegetation. - High level of connectivity between natural landscape and landforms.
	Human Influence	- High population. - High density in settlement - High presence of Infrastructure - High levels of landscape modification	- Low/dispersed population - No settlement - Absence of infrastructure - Landscape in natural state
	Activity	- High levels of traffic movement - Presence of freight and passenger transport networks. - Presence of production or industry.	- Low traffic movement - Absence of freight and passenger transport. - Absence of production or industry
	Rarity	- Typical landscape within a local and regional context.	- Unique combination of landscape features in a local and regional context.
	Relationship with Adjoining Landscapes	- Low visible connection with adjoining landscapes. - Low variability between adjoining landscapes. - Landscape features do not contribute to amenity from adjoining landscapes.	- High visibility with adjoining landscapes. - High variability and contrast with adjoining landscapes. - Landscape features contribute significantly to amenity of adjoining landscapes.

TABLE 3: Landscape Quality Rating

(Adapted from: Green Bean Landscape Architects, Collector Wind Farm: Visual Impact Assessment V5, Jan 2012)

2.2.7 Photomontages

A photomontage is a visualisation based on the superimposition of an image (ie building, road, landscape addition etc) onto a photograph for the purpose of creating a realistic representation of proposed or potential changes to a view. (Horner and Maclennan et al, 2006). Photomontages have been utilised in this Visual Impact Assessment to assist in the impact assessment of the proposal. Refer to **Section 6.0.**

3.0 The Site

3.1 The Site

Martins Creek Quarry is located off Station Street, Martins Creek approximately 20 Kilometres to the north of Maitland and 7 Kilometres north of Paterson in the Local Government Area (LGA) of Dungog Shire Council (DSC).

The subject land referred to as 'the Site', occupies a large parcel of irregular shaped land. The Site has been operating as a quarry extraction and processing area since 1915. The quarry was originally developed as a quarry for the purpose of providing materials for the construction and maintenance of the North Coast Railway. Materials for other purposes have also been produced from the high quality rock source including aggregates, ballast, manufactured sand and rock.

The Site is bounded to the west by the North Coast Rail line, to the south by Vogeles Road and to the north and east by dense vegetation associated with the ridgeline to the south of Merchants Road.

The topography of the site slopes downward in a generally south west direction from the vegetated ridgeline to the north east. A number of creek lines and ephemeral drainage lines run through the Site along valleys created by the topography.

Previous extraction undertaken on the Site has created two exposed pit sites, one to the east of Station Street (as shown in the birds eye image below), and one to the north west of Station Street. The remaining land on the site is densely vegetated.

Birds eye view of Martins Creek Quarry

(Source: http://www.theherald.com.au/story/2435373/daracon-expected-to-submit-da-for-martins-creek-quarry/)

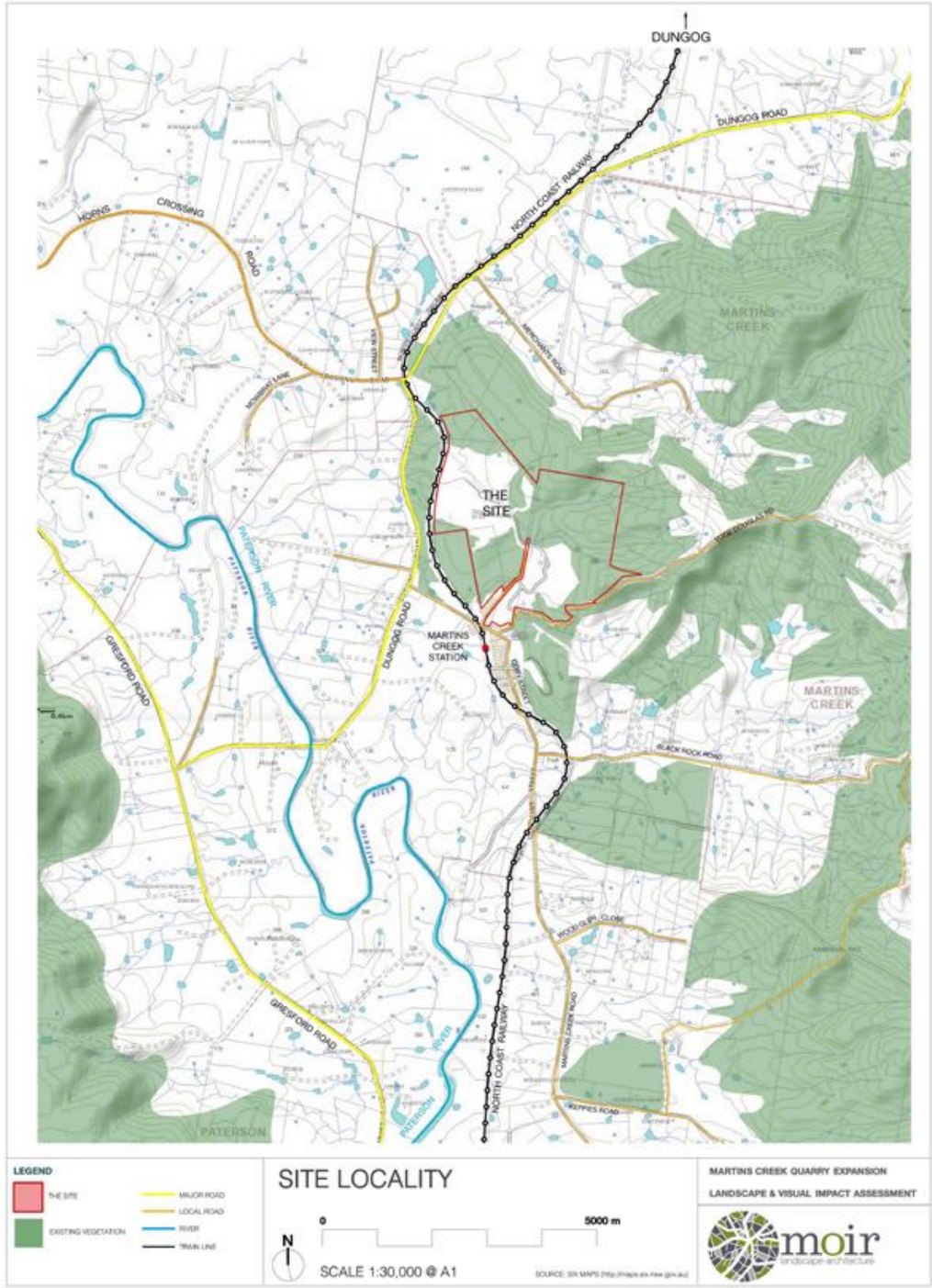


FIGURE 3: The Site Locality Plan

3.2 Proposed Development

Martins Creek Quarry was the subject of Development Consent in the early 1900s, enabling rock extraction from lots 5, 6 and 42 and processing (in the area described as Lot 1). The consent for lot 42 has since lapsed.

Operational faces upon lots 5 and 6 are well established and will continue to be developed to anticipated further depth of approximately 12 - 15 metres. Further rock extraction is planned to be conducted upon lots 5, 6, 42, 21 and 1 (as shown in **Figure 4**).

Daracon are seeking new consent for the operations of Martins Creek Quarry.

The proposed extension project involves:

- the extraction of up to 1.5 million tonnes of hard rock material per annum
- expanding into new extraction areas and clearing approximately 36.8 Hectares of vegetation
- Increasing the hours of operation
- consolidating existing operations and approvals
- rehabilitating the site
- access road is proposed to be located off Dungong Road, crossing the North Coast Railway into the western boundary of the Site.

An acoustic wall is proposed along the existing railway line on the eastern side of Station Street at a maximum height of up to 5 metres.

The development of the extraction faces and associated removal of vegetation will be progressive. It is anticipated areas determined to have the highest visual impact will be rehabilitated as early as practical to reduce the visual impacts.

Martins Creek Quarry - Viewed from Vogeles Road

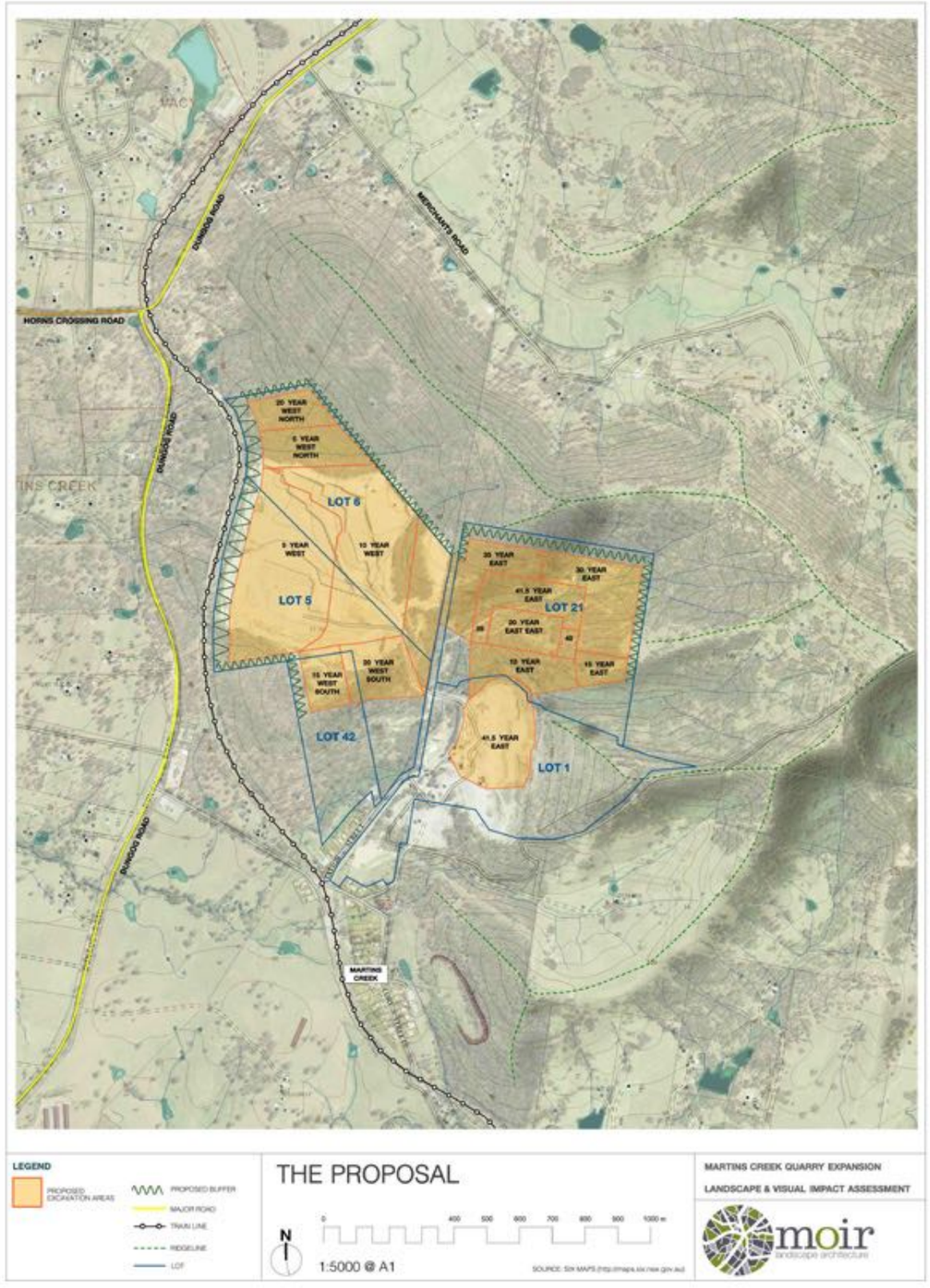


FIGURE 4: The Proposal

4.0 Existing Landscape Character

4.1 Regional Character

Martins Creek is a small town located between Dungong and Maitland within the south western corner of the Dungog Shire Council LGA. The main street of Martins Creek is Cory Street, which runs in a generally north south direction parallel with the North Coast railway line. The town consists a small number of older single storey dwellings concentrated along the main street. A small church and primary school are located on Cook Street to the south of the town.

While most of the surrounding land is utilised for agricultural purposes, some rural residential land has been established in the area. A more recent rural residential subdivision has been established to the north of Martins Creek, and to the south.

The region is characterised by a range of landscapes from steep vegetated slopes to gently undulating foothills and sloping agricultural land with scattered vegetation. Much of the area has retained a picturesque landscape character which is attributed to agricultural areas, large lot housing, undulating hills and vegetated ridge lines. A large, vegetated escarpment contains views to the west from Martins Creek, associated with Mount Johnstone. Views to the east from Gresford Road and surrounding land are contained by the vegetated hills associated with Martins Creek.

Paterson River runs in a generally north to south direction to the west of Martins Creek and has scattered to dense riparian vegetation. The river forms a part of the Hunter River catchment, running down from the Barrington Tops to the Hunter River. A number of smaller creek lines and drainage lines run into the Paterson River from surrounding mountain ranges through the slightly sloping rural land.

The North Coast railway line runs in a north direction, along the western boundary of the Site and then North West towards Dungog. Dungog Road and Gresford are the major roads in the area, with local roads running from these to provide access to rural residential properties.

Dense roadside vegetation - Typical of the area.

Vegetated ridge line associated with Martins Creek.

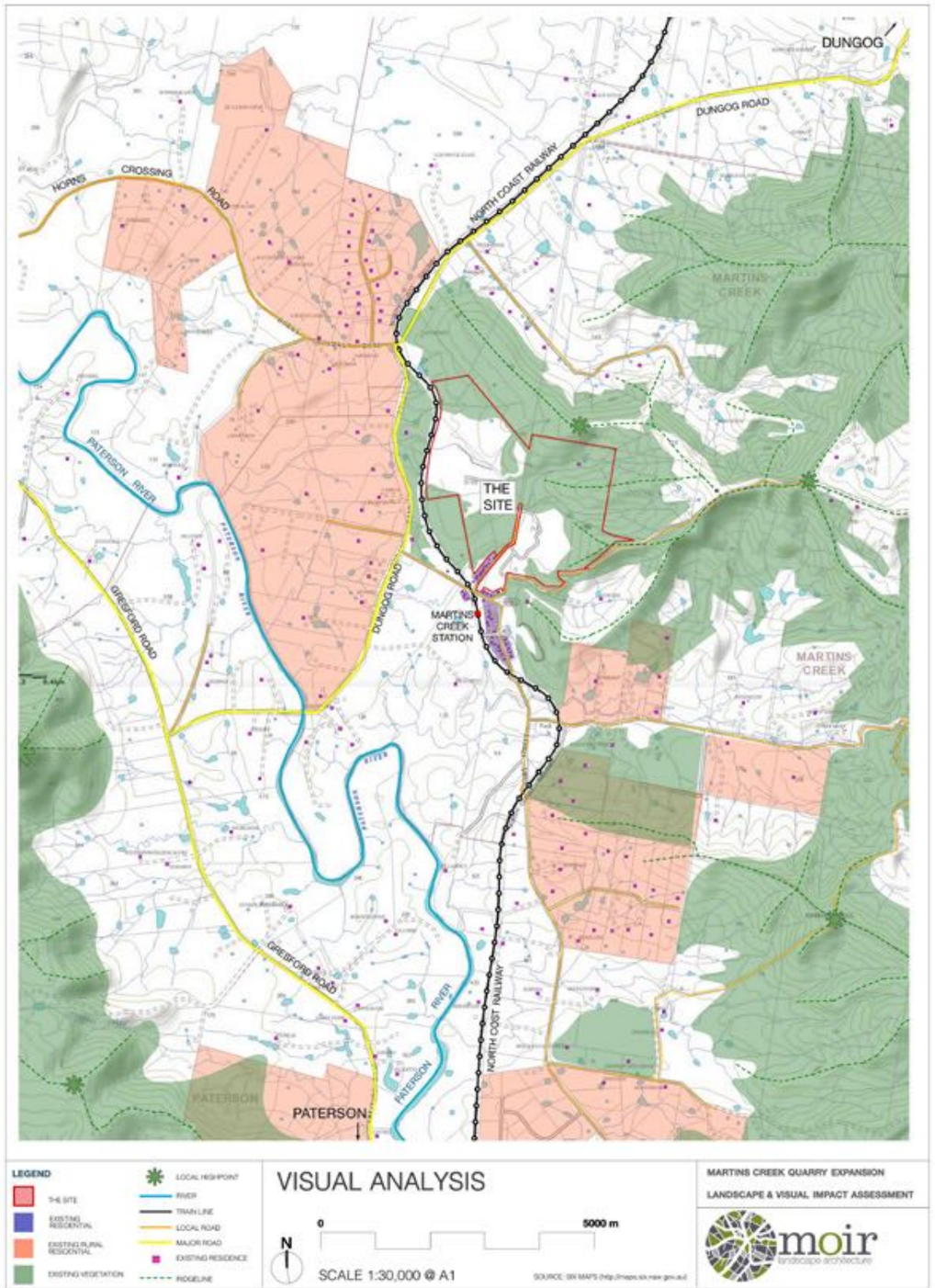


FIGURE 5: Visual Analysis.

4.2 Landscape Character Units

Generally one of the first steps in carrying out a landscape and visual assessment is to identify and map the Landscape Character of the surrounding area.

The landscape character of a site refers to the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects a particular combination of geology, landform, soils, vegetation, land use and human settlement and creates a particular sense of place for different areas within the landscape. (Horner and Maclennan et al, 2006).

The existing landscape context of the site and its surrounding environment are classified into distinct and relatively homogenous units of landscape character (refer to **Figure 6**). These landscape character units (LCU) are summarised below and form the elements of the local visual context hence their quality also reflects to a degree its visual amenity.

The landscape quality of each LCU has been assessed using process outlined in **Table 3** in **Section 2** of this report. Due to the predominantly rural character of the area, the LCUs generally have a moderate landscape quality rating. Modifications to the landscape has occured overtime through roads, railway lines, infrastructure land clearing and ancillary structures associated with agriculture.

The Landscape Character Units for the purpose of this report and their landscape quality rating been defined in **Table 4**.

LCU	LANDSCAPE CHARACTER UNIT	LANDSCAPE QUALITY RATING
LCU01	Mount Johnstone	MODERATE - HIGH
LCU02	Martins Creek	MODERATE
LCU03	Martins Creek Rural	MODERATE
LCU04	Horns Crossing	MODERATE
LCU05	Paterson Rural	MODERATE - HIGH

TABLE 4: Landscape Character Units Quality Rating.

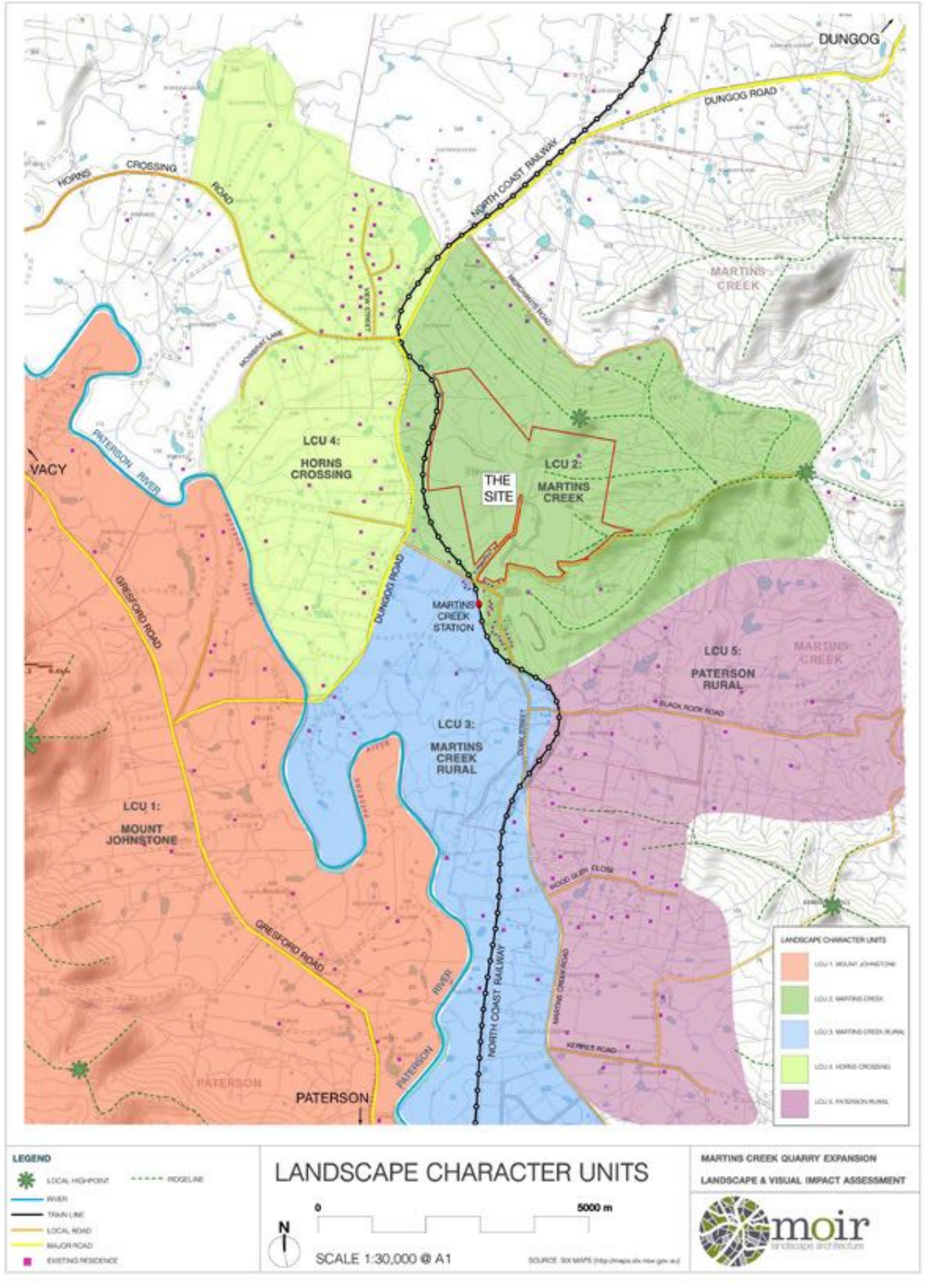


FIGURE 6: Landscape Character Units

4.3 Landscape Character Unit Descriptions

LCU 1. Mount Johnstone

The Mount Johnstone Landscape Character Unit (LCU) is located to the south west of the Site. The LCU is defined as the open, rural land associated with the foothills of the Mount Johnstone Ranges.

The LCU is characterised by gently undulating land which has been extensively cleared for agricultrual pruposes. Some scattered vegetation exists within the LCU, generally associated with residences, drainage lines and roads.

The LCU is bounded to the east by the Paterson River and associated vegetation which creates a physical and visual barrier through the otherwise cleared land. A number of small creek lines and drainage lines run through the landscape from the nearby ranges into Paterson River. Gresford Road runs along the slightly sloping land to the east of the Mount Johnstone Ranges in a generally north west direction from the small town of Paterson to Vacy.

The LCU is largely uninhabited agricultural land, with scattered residences servicing the agricultural land, generally accessed via long driveways off Gresford Road.

Distant views are available across the predominantly cleared land towards the ranges associated with Martins Creek.

The landscape quality rating of the Mouth Johnstone LCU has been rated as moderate to high due to the low level of development, diversity of topographical range and distant views.

LCU 2. Martins Creek

For the purpose of this report, the Martins Creek LCU is characterised by the town of Martins Creek and surrounding vegetated hills to the north east of the town. Martins Creek is a small rural town located off Dungog Road. The town itself consists of a small number of one storey residential dwellings located along Cory Street, Grace Avenue and Station Street.

The North Coast Railway line runs along the western boundary of lots associated with Cory Street, crossing Grace Avenue near the intersection of Station Street. A rail siding runs parallel to Station Street in a north east direction into the Martins Creek Quarry. The siding has a level rail crossing across Cory Street to allow it to connect into the NSW rail network.

The LCU is predominantly vegetated with some cleared areas (generally associated with the Site and residential lots). The landscape is undulating with two major ridgelines to the north, east and south of the Quarry. Martins Creek Quarry is a dominant landscape element within the LCU. The Quarry is located within close proximity to a number of residential lots.

Views within the LCU, are mostly contained by the dense vegetation and undulating topography associated with hills surrounding the Quarry. The existing quarry is largely screened from residences by vegetation. Dense vegetation associated with the LCU contributes to the character of the town.

The Martins Creek LCU has been rated as having a moderate landscape quality rating due to a moderate level of development and change to the existing landscape by resulting from the modification to land associated with the existing quarry.

View of Mount Johnstone from the intersection of Dungog and Gresford Road.

Rural residence accessed via long driveway off Gresford Road. Views towards vegetated ranges in Martins Creek.

Martins Creek Quarry - viewed from southern site boundary along Vogeles Road.

Single storey residential dwellings associated with Cory Street - Martins Creek.

4.0 Existing Landscape Character (contd.)

LCU 3. Martins Creek Rural

The Martins Creek Rural LCU is generally characterised as the rural residential land to the west of Martins Creek Road and east of Paterson River and Dungog Road.

The land in this area is generally characterised by slightly sloping topography with isolated rural residences accessed off Martins Creek Road. The majority of land has been cleared with the exception of scattered native vegetation throughout the landscape, generally associated with homesteads and roads. A number of small creeklines and drainage lines run through the landscape, into the Paterson River. Creek lines and rivers are skirted by native riparian vegetation.

The North Coast Railway Line runs through landscape in a generally north - south direction from Martins Creek Station.

The Martins Creek Rural LCU has been rated as having a moderate landscape quality.

LCU 3 - Rural residential property on Black Rock Road.

LCU 3 - Rural residential property on Cook Street.

LCU 4 - View from View Street to Horns Crossing Road.

LCU 4 - View from View Street to Horns Crossing Road.

LCU 4. Horns Crossing

For the purpose of this report, the Horns Crossing LCU is identified as the land to the west of Dungog Road, north of the Paterson River and Horns Crossing Road. The LCU is characterised by moderate to densely vegetated land which accomodates rural residential properties.

The topography is undulating and combined with the dense vegetation, views both within and out from the LCU are generally screened. A more recent residential estate is located north off Horns Crossing Road, associated with View Street.

The landscape quality of this LCU has been rated as moderate.

LCU 5. Paterson Rural

The Paterson Rural LCU is generally characterised as the rural residential land to the east of Martins Creek Road, and to the south of the ridgeline associated with Voge Douglas Road.

Residences are generally located on the slightly undulating land associated with roads accessed off Martins Creek Road including Black Rock Road, Woodglen Close and Keppies Road.

Land in this area is undulating and moderately to densely vegetated with the exception of some lots which have been cleared for agricultural purposes.

Views from the LCU are generally contained to the north and east by the undulating topography and dense vegetation.

The Paterson rural LCU has been rated as having a moderate - high landscape quality due to the diversity in topographical range and low level of human influence.

LCU 5 - Black Rock Road.

LCU 5 - Rural residence on Woodglen Close.

5.0 Viewpoint Analysis

5.1 Viewpoint Analysis

This part of the visual assessment considers the likely impact that development would have on the existing landscape character and visual amenity by selecting prominent sites, otherwise referred to as viewpoints.

5.1.1 Viewpoint Selection Process

Viewpoints are selected to illustrate a combination of the following:

- Present landscape character types.
- Areas of high landscape or scenic value.
- Visual composition (eg. focused or panoramic views, simple or complex landscape pattern).
- Range of distances.
- Varying aspects.
- Various elevations.
- Various extent of development visibility (full and partial visibility).
- Sequential along specific routes.

Viewpoints have been carefully selected to be representative of the range of views within the study area. The selection of viewpoints is informed by topographical maps, field work observations and other relevant influences such as access, landscape character and the popularity of vantage points.

A total of **16 viewpoints** were taken as apart of the field work process. The majority of these viewpoints were taken from roads within close proximity to the Site. A number of viewpoints were also taken from regionally significant locations. The viewpoints which have been included represent the areas from where the development would appear most prominent, either based on the degree of exposure or the number of people likely to be affected.

It is important to note that viewpoints for this study have been taken only from accessible public land, however where possible this does incorporate viewpoints adjacent to residences potentially affected by the development.

5.1.2 Process of Viewpoint Analysis

Once the viewpoint had been selected, panoramic photographs were taken at eye level from the viewpoints towards The Site. Photographs were taken with a Canon EOS 50D Mark III Full Frame Digital SLR through a 50mm fixed focal lens which closely represents the central field of vision of the human eye. The visual impact of the viewpoint was then assessed both on site and with the topographic and aerial information to ensure accuracy. Viewpoint photographs and analyses are included the following pages. The findings of the viewpoint analysis have been quantified and are summarised in **Table 5**.

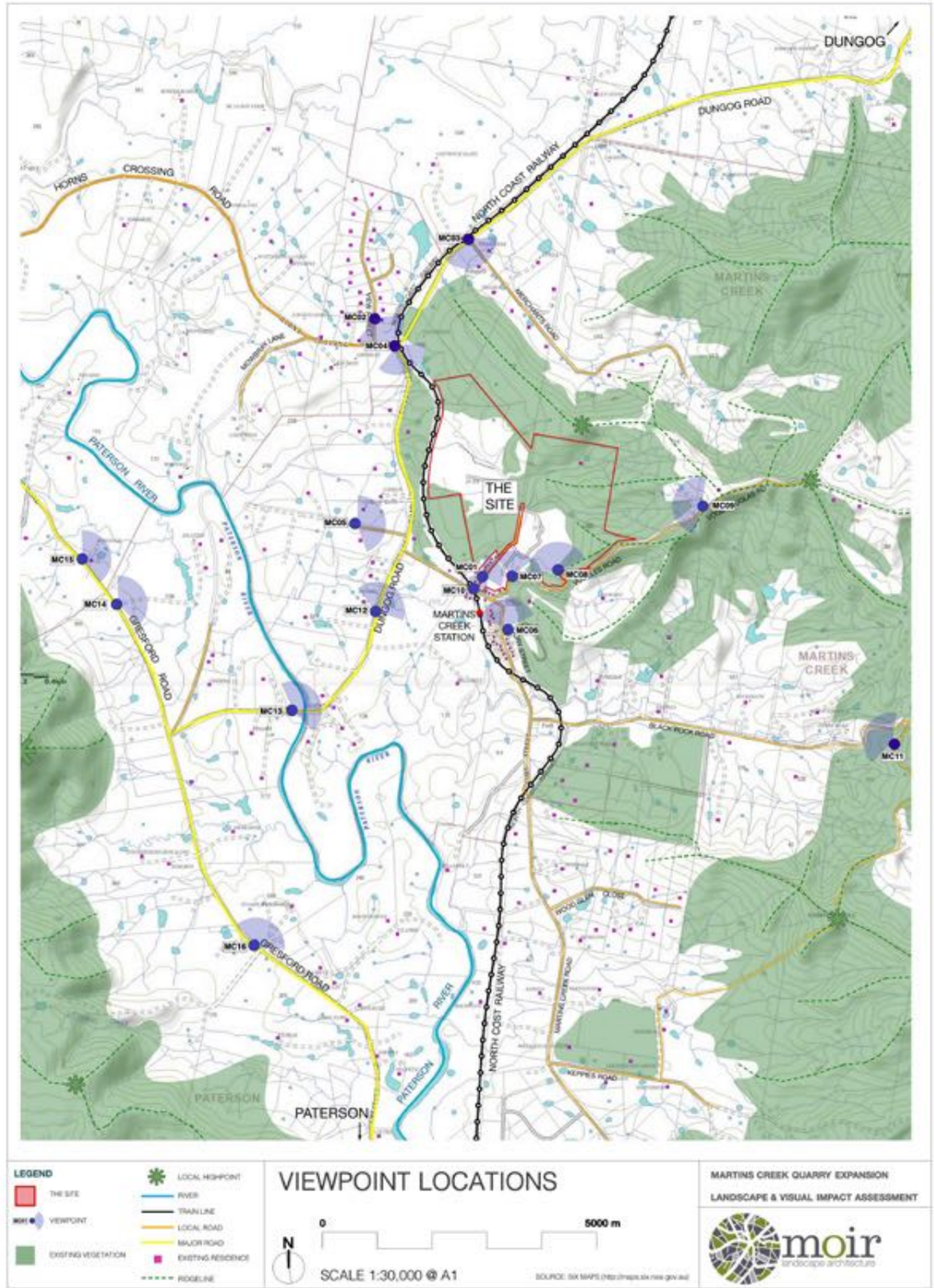


FIGURE 7: Viewpoint Assessment Locations.

5.0 Viewpoint Analysis (contd.)

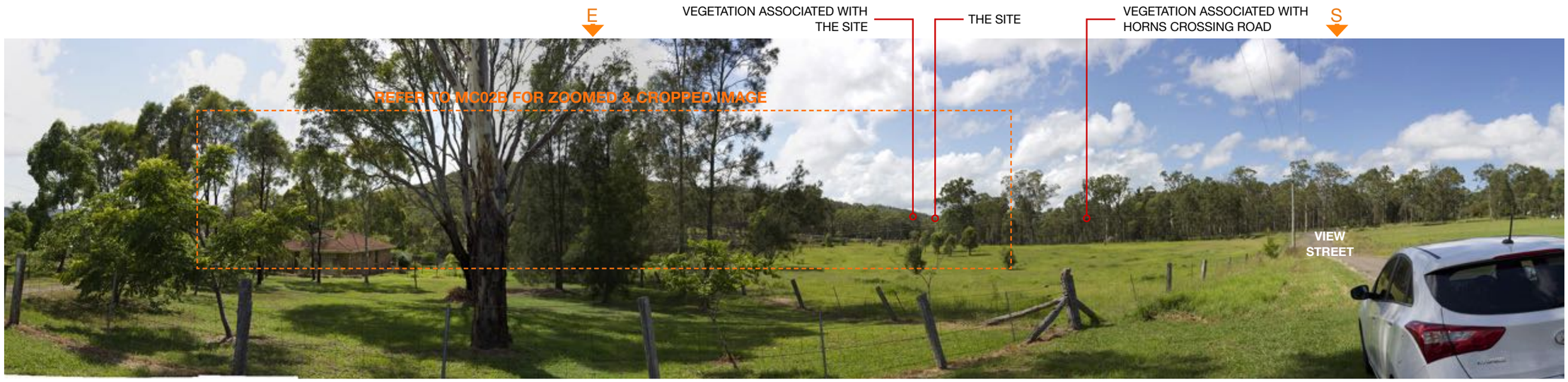
VIEWPOINT MC01A: Station Street

VIEWPOINT MC01B: Station Street cropped from MC01A

MC01 Viewpoint Location

VIEWPOINT MC01			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Station Street, Martins Creek	View looking north east along Station Street towards the proposed expansion of the site. Single storey residential dwellings typical of Martins Creek are evident along Station Street with little vegetation within residential lots. A small rise in topography is associated with the rail siding which runs parallel to Station Street into the site. The visual sensitivity of this viewpoint has been rated as high due to the close proximity of the site to surrounding residential dwellings.	From this viewpoint some glimpse views of change to distant tree canopies associated with the proposal may be evident as the topography rises towards the Station Street quarry entry. The proposed acoustic wall along the existing railway line will be visible along the top of the embankment on the eastern side of Station Street. The visual effect has been assessed as moderate resulting in a visual impact of high from this location. Landscaping to the front of the proposed wall would significantly reduce the visual impact overtime. **Refer to Photomontage 01.**
COORDINATES	S 32º 33.404' E 151º 37.117'		
ELEVATION	27m		
VIEWING DIRECTION	North East		
DISTANCE TO SITE	15m (to nearest boundary)		
LCU	Martins Creek		
VISUAL EFFECT	Moderate		
VISUAL IMPACT	High		

5.0 Viewpoint Analysis (contd.)



VIEWPOINT MC02A: View Street

VIEWPOINT MC02B: View Street cropped from MC02A

MC02 Viewpoint Location

VIEWPOINT MC02			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	View Street, Vacy	View from minor local road, View Street with surrounding rural residential properties. Topography in this area is generally cleared and slightly sloping with vegetation clusters surrounding residential dwellings. The open low rise areas are viewed against a backdrop of densely vegetated hilltops. The visual sensitivity of this viewpoint has been rated as high due to the close proximity to the site and surrounding residential dwellings.	Vegetation associated with Horns Crossing Road screens views towards the south from this viewpoint. It is likely some clearing of vegetation associated with the proposed excavation would be noticeable. However in the context of the surrounding vegetation the visual effect would not be discernible.
COORDINATES	S 32° 32.410' E 151° 36.645'		
ELEVATION	14m		
VIEWING DIRECTION	South East		
DISTANCE TO SITE	650m (to nearest boundary)		
LCU	Horns Crossing		
VISUAL EFFECT	Nil		
VISUAL IMPACT	Nil		

5.0 Viewpoint Analysis (contd.)

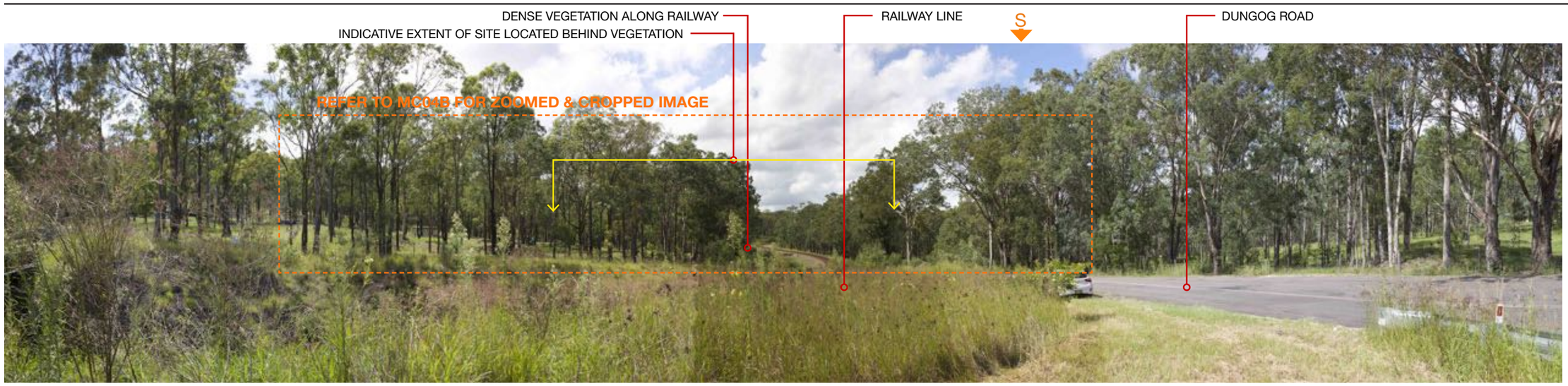
VIEWPOINT MC03A: Dungog Road

VIEWPOINT MC03B: Dungog Road cropped from MC03A

MC03 Viewpoint Location

VIEWPOINT MC03			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Corner of Dungog Rd & Merchants Road	View from Dungog Road looking generally south east direction towards the site. Dungog Road is a major road linking Paterson and Martins Creek with the town of Dungog approximately 20km north east. The land is slightly sloping and generally open surrounding rural residential properties. Clusters of vegetation around dwellings and property boundaries is evident. Densely vegetated undulating topography is dominant in the backdrop behind residential properties from this viewpoint. The visual sensitivity of this viewpoint has been rated as moderate due to the land use being a main road corridor and proximity to the site.	The densely vegetated ridge screens views from this viewpoint towards the south. The proposal would not be visible from this viewpoint. This viewpoint has been included to illustrate the character of this area.
COORDINATES	S 32º 32.094' E 151º 37.072'		
ELEVATION	12m		
VIEWING DIRECTION	Generally South East		
DISTANCE TO SITE	1.04km		
LCU	N/A		
VISUAL EFFECT	Nil		
VISUAL IMPACT	Nil		

5.0 Viewpoint Analysis (contd.)



VIEWPOINT MC04A: Corner of Dungog & Horns Crossing Roads

VIEWPOINT MC04B: Corner of Dungog & Horns Crossing Roads cropped from MC04A

MC04 Viewpoint Location

VIEWPOINT MC04			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Corner Dungog & Horns Crossing Road	View from the corner of Dungog Road and Horns Crossing Road, directly adjacent to the railway corridor, looking generally south towards the site. Land in this area is generally characterised by the railway and road intersection with dense surrounding vegetation. The topography surrounding is low rise with disturbance from the railway corridor. The visual sensitivity of this viewpoint is moderate due to the land use and close proximity to the site boundary.	The dense vegetation adjacent to the railway corridor screens views from this viewpoint towards the proposal. The proposal would not be visible from this viewpoint.
COORDINATES	S 32° 32.506' E 151° 36.743'		
ELEVATION	32m		
VIEWING DIRECTION	Generally South		
DISTANCE TO SITE	420m		
LCU	Martins Creek		
VISUAL EFFECT	Nil		
VISUAL IMPACT	Nil		

5.0 Viewpoint Analysis (contd.)

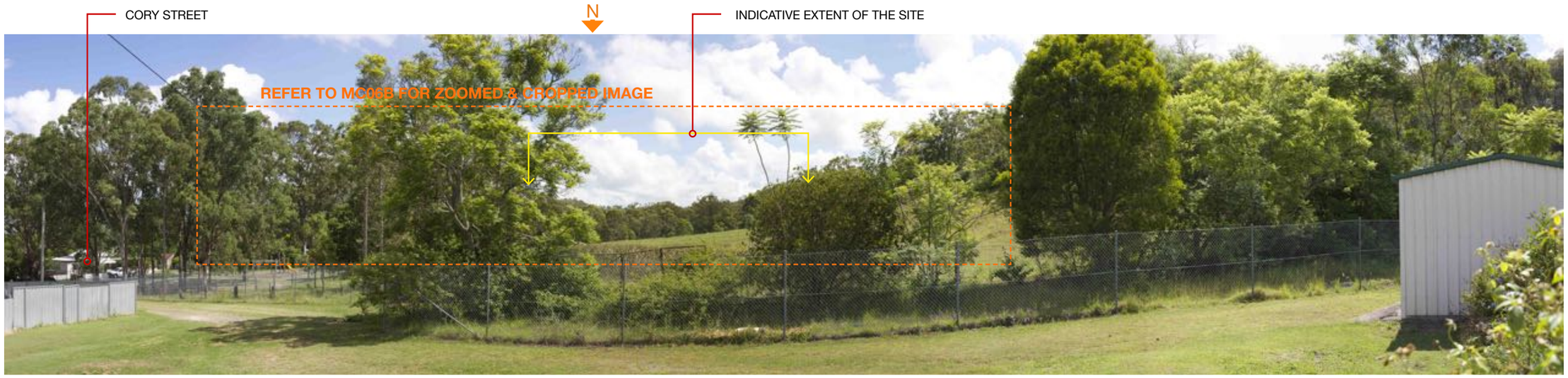
VIEWPOINT MC05A: Lane off Dungog Road

VIEWPOINT MC05B: Lane off Dungog Road zoomed and cropped from MC05A

MC05 Viewpoint Location

VIEWPOINT MC05			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Lane off Dungog Road	This photograph was taken in a generally south east direction from the highpoint of an unsealed road off Dungog Road. The road links to surrounding rural residential properties of undulating topography. Views from this location are contained by fragmented vegetation within rural properties and undulating, densely vegetated topography in the backdrop. The visual sensitivity of this viewpoint has been rated as high due to the close proximity of the site and surrounding residential land use.	From this viewpoint it is likely the proposal would be screened by vegetation associated with surrounding properties. The proposal would not be visible from this viewpoint. This viewpoint has been included to illustrate the character of the areas.
COORDINATES	S 32° 33.199' E 151° 36.569'		
ELEVATION	30m		
VIEWING DIRECTION	South East		
DISTANCE TO SITE	557m		
LCU	Horns Crossing		
VISUAL EFFECT	Nil		
VISUAL IMPACT	Nil		

5.0 Viewpoint Analysis (contd.)



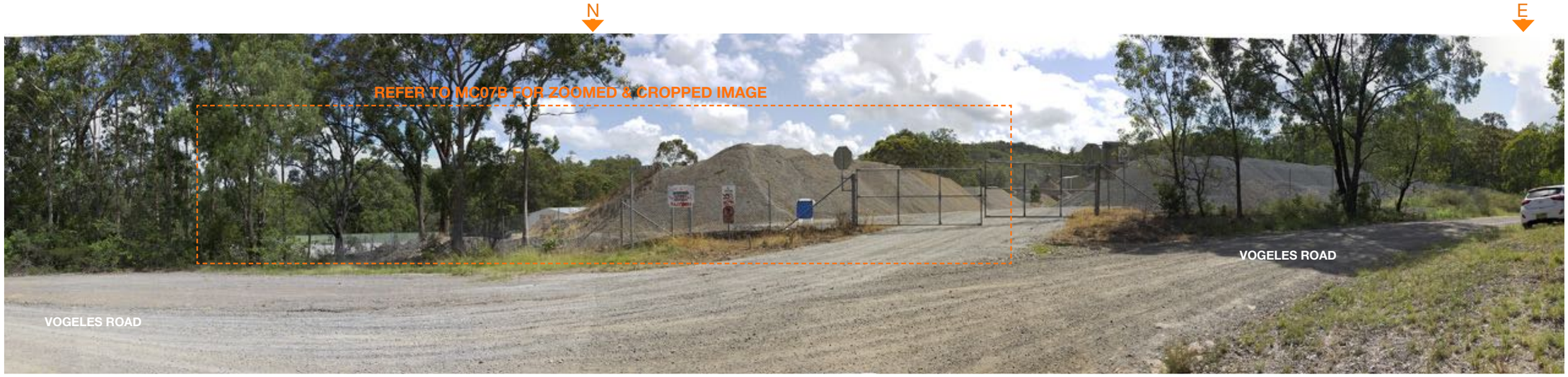
VIEWPOINT MC06A: Martins Creek Tennis Court

VIEWPOINT MC06B: Martins Creek zoomed and cropped from MC06A

MC06 Viewpoint Location

VIEWPOINT MC06			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Martins Creek Tennis Court	View north towards the proposal from the Martins Creek tennis courts, adjacent to single storey residential dwellings associated with Cory Street. Views are contained due to gently sloping topography and dense vegetation both in the foreground and backdrop. Tree canopies within the proposal are visible on a slightly raised portion of land in the distance to the north. Visual sensitivity of this viewpoint has been rated as high due to the close proximity to surrounding residential dwellings.	From this viewpoint some glimpse views of change to distant tree canopies may be evident. It is unlikely the proposal would be noticeable, resulting in minimal visual effect as a result. There is likely to be no visual impact from this location.
COORDINATES	S 32º 33.620' E 151º 37.261'		
ELEVATION	38m		
VIEWING DIRECTION	North		
DISTANCE TO SITE	375m		
LCU	Martins Creek		
VISUAL EFFECT	Nil		
VISUAL IMPACT	Nil		

5.0 Viewpoint Analysis (contd.)



VIEWPOINT MC07A: Vogeles Road

VIEWPOINT MC07B: Vogeles Road zoomed and cropped from MC07A

MC07 Viewpoint Location

VIEWPOINT MC07			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Vogeles Road, Martins Creek	This photograph was taken from a dominant bend in Vogeles Road, looking north directly into the site. Vogeles Road is a minor local road of low frequency use, increasing in elevation towards the east. The road provides access to a few rural residential properties east of the site. The unseal road is characterised by unscreened views of the quarry and dense vegetation on the opposite side of the road. The topography is generally low rise with disturbance visible due to the close proximity to the site. The visual sensitivity of this viewpoint is moderate due to the direct proximity to the site and minor local road.	From this viewpoint it is likely the removal of vegetation associated with the proposed expansion would be visible in the background where the topography rises. The visual effect from this viewpoint has been rated moderate and the resulting visual impact is rated as moderate impact.
COORDINATES	S 32° 33.388' E 151° 37.263'		
ELEVATION	47m		
VIEWING DIRECTION	North		
DISTANCE TO SITE	10m		
LCU	Martins Creek		
VISUAL EFFECT	Moderate		
VISUAL IMPACT	Moderate		

5.0 Viewpoint Analysis (contd.)

VIEWPOINT MC08A: Douglas Voge Road

VIEWPOINT MC08B: Douglas Voge Road zoomed and cropped from MC08A

MC08 Viewpoint Location

VIEWPOINT MC08			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Douglas Voge Road	View from highpoint in the road verge along Douglas Voge Road looking north west. Douglas Voge Road is unsealed and steeply sloping with dense native vegetation screening the surrounding outlook from street level. The road links to surrounding rural properties as the road climbs in elevation from the town of Martins Creek. This photograph was taken off the road and from a highpoint in the road verge with open and unscreened views of the site. This viewpoint differs to the typical screened outlook from the usual road level. The visual sensitivity of this viewpoint has been assessed as moderate as a result of the close proximity to the site and minor local road.	From this viewpoint change to vegetation and topography associated with the proposal is likely to be visible and unscreened. The proposed works would appear as an extension of the existing quarry. Due to the extent of existing disturbance to the natural topography the proposed quarry extension would have a low visual effect from this viewpoint. The resulting visual impact has been rated as moderate. **Refer to photomontage 02.**
COORDINATES	S 32° 33.370' E 151° 37.475'		
ELEVATION	87m		
VIEWING DIRECTION	North West		
DISTANCE TO SITE	30m		
LCU	Martins Creek Hills		
VISUAL EFFECT	Moderate		
VISUAL IMPACT	Moderate		

5.0 Viewpoint Analysis (contd.)

VIEWPOINT MC09A: Douglas Voge Road

VIEWPOINT MC09B: Douglas Voge Road zoomed and cropped from MC09A

MC09 Viewpoint Location

VIEWPOINT MC09			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Douglas Voge Road	This photograph was taken looking north west from a cleared highpoint along Douglas Voge Road as the road climbs in elevation from the town of Martins Creek. Douglas Voge Road provides access to a small number of rural properties. The road is unsealed and steep, characterised by dense roadside vegetation screening the outlook beyond. The landscape is typically undulating agricultural land with scattered vegetation that fragments views to distant vegetated ranges. The visual sensitivity of this viewpoint has been assessed as moderate due to close proximity to the nearest site boundary and surrounding land use.	From this viewpoint change to vegetation canopies and topography associated with the proposal is likely to be visible to the west. The visual effect of this viewpoint has been rated as low. The fragmented vegetation along the roadside and within properties would assist in screening the proposal. The resulting visual impact has been rated as low.
COORDINATES	S 32º 33.134’ E 151º 38.123’		
ELEVATION	200m		
VIEWING DIRECTION	North West		
DISTANCE TO SITE	650m (nearest boundary)		
LCU	Martins Creek Hills		
VISUAL EFFECT	Low		
VISUAL IMPACT	Low		

5.0 Viewpoint Analysis (contd.)

VIEWPOINT MC10A: Cory Street

VIEWPOINT MC10B: Cory Street zoomed and cropped from MC10A

MC10 Viewpoint Location

VIEWPOINT MC10			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Cory Street	View looking north from Cory Street, adjacent to the rail siding within the town of Martins Creek. The landscape is slightly sloping, characterised by the dominant railway corridor, nearby station and intersection of Grace Avenue and Station Street. The main quarry entry is accessed via the intersection at Station Street, regularly utilised by vehicles associated with the quarry. Vegetation within surrounding residential properties and road verges is present and screens views towards the site. The visual sensitivity of this viewpoint is high due to surrounding residential dwellings and close proximity to the nearest site boundary.	From this viewpoint some glimpse views of change to distant tree canopy densities may be evident as the topography rises to the north. It is unlikely the proposal would be discernible, resulting in minimal visual effect. The proposed acoustic wall associated with the existing railway corridor will be visible from this location, resulting in a low visual effect. The visual impact has been assessed as moderate from this location.
COORDINATES	S 32º 33.455’ E 151º 37.110’		
ELEVATION	46m		
VIEWING DIRECTION	North		
DISTANCE TO SITE	45m (nearest boundary)		
LCU	Martins Creek		
VISUAL EFFECT	Low		
VISUAL IMPACT	Moderate		

5.0 Viewpoint Analysis (contd.)

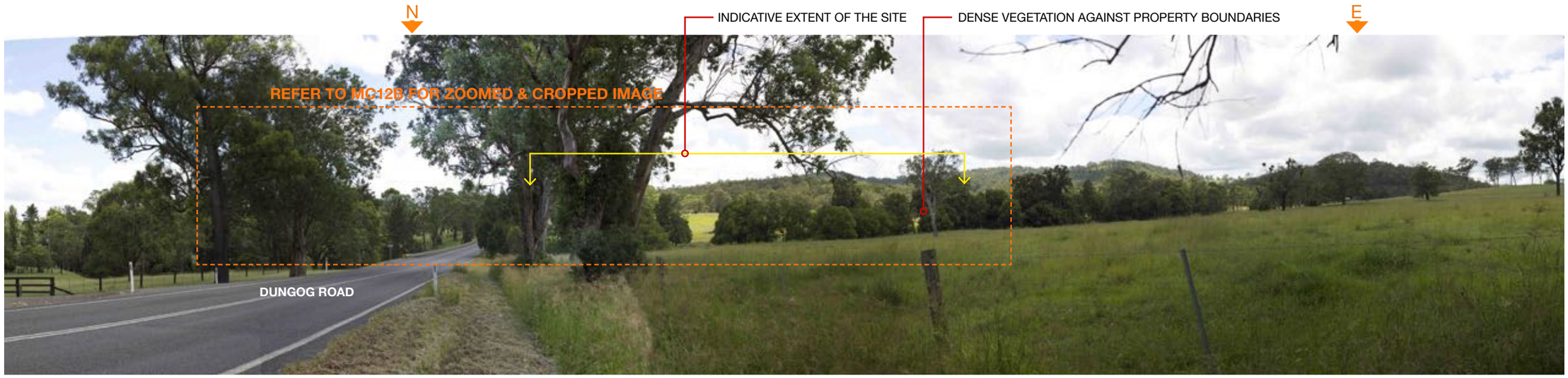
VIEWPOINT MC11A: Black Rock Road

VIEWPOINT MC11B: Black Rock Road zoomed and cropped from MC11A

MC11 Viewpoint Location

VIEWPOINT MC11			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Black Rock Road	View looking in a generally west direction from a highpoint and clearing along the unsealed Black Rock Road. Black Rock Road climbs steeply in elevation, serving as an access road to various rural properties. The road follows the natural ridgeline, characterised by undulating topography and dense vegetation communities. Distant views are evident from high points in the topography to mountain ranges west of the viewpoint. The visual sensitivity of this viewpoint has been rated as low due to the distance from the site and land use.	The dominant mountain ridgeline in the backdrop screens all visibility to the site in the north west. Consequently, the proposal would not be visible from this viewpoint. This viewpoint has been included to illustrate the typical character of this area.
COORDINATES	S 32° 34.032' E 151° 38.984'		
ELEVATION	164m		
VIEWING DIRECTION	West		
DISTANCE TO SITE	2.66km		
LCU	Paterson Rural		
VISUAL EFFECT	Nil		
VISUAL IMPACT	Nil		

5.0 Viewpoint Analysis (contd.)



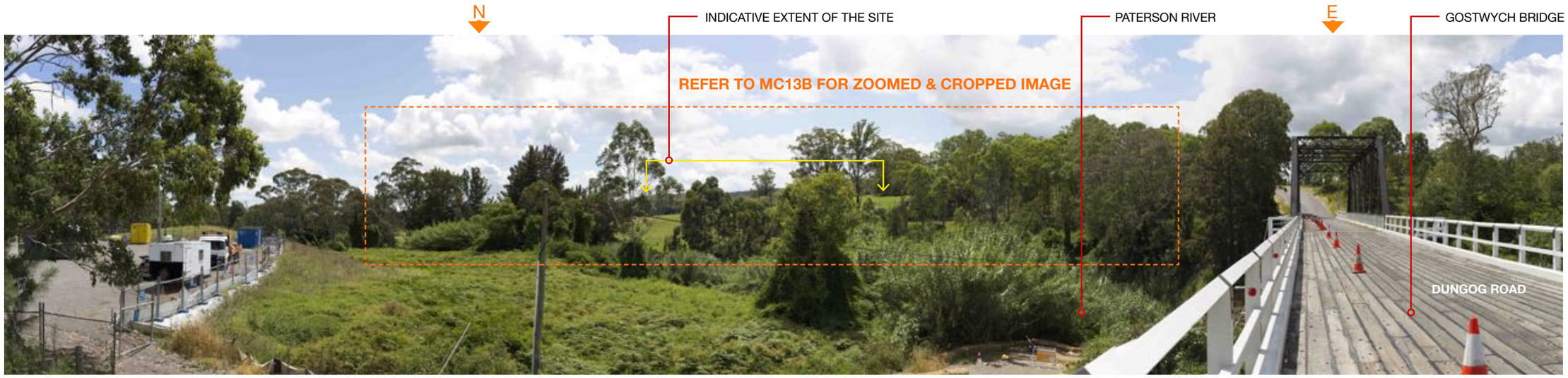
VIEWPOINT MC12A: Dungog Road

VIEWPOINT MC12B: Dungog Road zoomed and cropped from MC12A

MC12 Viewpoint Location

VIEWPOINT MC12			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Dungog Road	This photograph was taken looking north east from Dungog Road approximately 500m south from the intersection with Grace Avenue. Dungog Road is a main travel corridor connecting Martins Creek with Vacy and Paterson. The surrounding landscape is characterised by undulating topography and cleared rural properties. Vegetation is generally associated with roads, drainage lines and properties. Tree canopies within the proposal form part of the distant high points in the backdrop to the north east. The visual sensitivity of this viewpoint has been rated as moderate as a result of the close proximity to the site.	From this viewpoint the removal of vegetation to accommodate the proposal is likely to be visible to the north east. The undulating topography and dense vegetation along property boundaries would help to fragment views of the vegetation clearing. Consequently, the visual effect of this viewpoint has been rated as moderate and the resulting visual impact has been rated as moderate. **Refer to Photomontage 03.**
COORDINATES	S 32° 33.527' E 151° 36.652'		
ELEVATION	37m		
VIEWING DIRECTION	North East		
DISTANCE TO SITE	740m		
LCU	Martins Creek Rural		
VISUAL EFFECT	Moderate		
VISUAL IMPACT	Moderate		

5.0 Viewpoint Analysis (contd.)



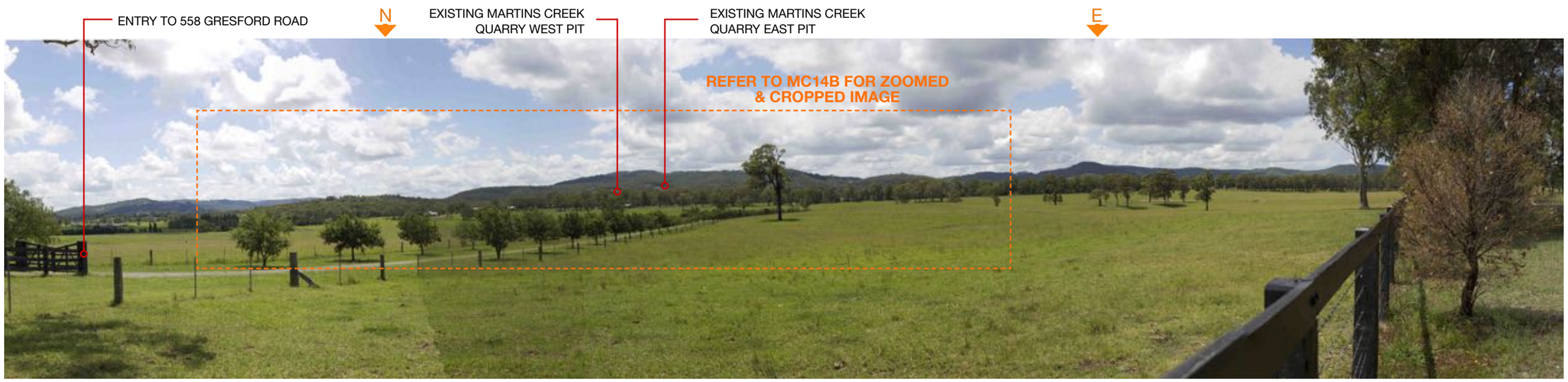
VIEWPOINT MC13A: Gostwych Bridge

VIEWPOINT MC13B: Gostwych zoomed and cropped from MC13A

MC13 Viewpoint Location

VIEWPOINT MC13			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Gostwych Bridge	View looking north east from Gostwych Bridge at the Paterson River crossing of Dungog Road. The surrounding landscape is characterised by the main travel corridor and bridge of Dungog Road, connecting Martins Creek with the intersection of Gresford Road approximately 700m west. Surrounding rural properties are mostly open with scattered vegetation along the road corridor. The Paterson River and associated steep banks form a dominant feature as well as the dense riparian vegetation that screens surrounding views at road level. The visual sensitivity of this viewpoint is rated as moderate due to the land use as a main travel corridor and close proximity to the site.	Tree canopies visible on the distant hills from this viewpoint are likely to change as a result of trees being removed to accommodate the proposed works. It is likely views towards the change in vegetation would be fragmented by existing vegetation and unlikely to be discernible by motorists travelling along Dungog Road. The visual effect of this viewpoint has been rated as low and the resulting visual impact as low.
COORDINATES	S 32° 33.896’ E 151° 36.283’		
ELEVATION	31m		
VIEWING DIRECTION	North East		
DISTANCE TO SITE	1.55km		
LCU	Martins Creek Rural		
VISUAL EFFECT	Low		
VISUAL IMPACT	Low		

5.0 Viewpoint Analysis (contd.)



VIEWPOINT MC14A: Gresford Road

VIEWPOINT MC14B: Gresford Road zoomed and cropped from MC14A

MC14 Viewpoint Location

VIEWPOINT MC14			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Gresford Road	View looking north east from Gresford Road, approximately 1km north from the intersection of Dungog Road. The surrounding landscape is characterised by the dominant vegetated mountain ranges to the north east, and open low lying rural properties with fragmented vegetation clusters. From this viewpoint the existing quarry excavation is evident to the north east within the mountain ranges. The visual sensitivity of this viewpoint is rated as moderate due to the land use and distance to the proposal.	From this viewpoint change to distant vegetation canopies and earthworks associated with the proposal is likely to be visible on the dominant mountain backdrop. The limited vegetation screening and surrounding properties results in a moderate visual effect and moderate visual impact.
COORDINATES	S 32° 33.503' E 151° 35.485'		
ELEVATION	41m		
VIEWING DIRECTION	North East		
DISTANCE TO SITE	2.34km		
LCU	Mount Johnson		
VISUAL EFFECT	Moderate		
VISUAL IMPACT	Moderate		

5.0 Viewpoint Analysis (contd.)

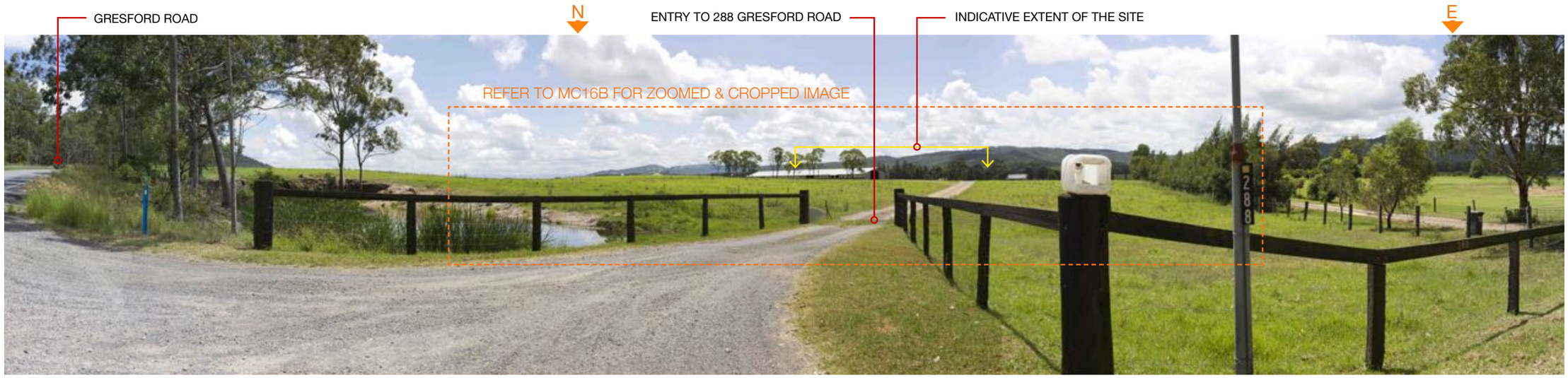
VIEWPOINT MC15A: Gresford Road

VIEWPOINT MC15B: Gresford Road zoomed and cropped from MC15A

MC15 Viewpoint Location

VIEWPOINT MC15			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Gresford Road	View north east from Gresford Road, near the entry to number 598. The surrounding landscape is predominantly cleared agricultural land with fragmented vegetation along boundaries. The distant mountains to the north east are a dominant characteristic of the landscape. The visual sensitivity of this viewpoint is moderate.	As a result of the existing quarry excavation being clearly visible, it is likely the proposal will change the natural ridgeline in the backdrop. The associated proposal is likely to change visible tree canopies and the natural topography. As a result of the proposed expansion the visual effect is likely to be moderate, resulting in a moderate visual impact. **Refer to Photomontage 04.**
COORDINATES	S 32° 33.327' E 151° 35.324'		
ELEVATION	39m		
VIEWING DIRECTION	North East		
DISTANCE TO SITE	2.52km		
LCU	Paterson Rural		
VISUAL EFFECT	Moderate		
VISUAL IMPACT	Moderate		

5.0 Viewpoint Analysis (contd.)



VIEWPOINT MC16A: Gresford Road

VIEWPOINT MC16B: Gresford Road zoomed and cropped from MC16A

MC16 Viewpoint Location

VIEWPOINT MC16			
SUMMARY OF VIEWPOINT		VIEWPOINT DESCRIPTION	POTENTIAL VISUAL IMPACT
LOCATION	Gresford Road	View north east towards the site from the entry to 288 Dungog Road, approximately 3.2km north west of Paterson town centre. The surrounding landscape is slightly undulating between rural residential properties with mostly open agricultural land, dense boundary vegetation and dominant views to the vegetated mountain backdrop beyond. The land use and distance to the site results in a moderate visual sensitivity.	The loss of vegetation associated with the proposal is likely to be visible to the north east. Vegetation and structures associated with the property will assist in screening views to the proposal. The visual effect of this viewpoint is rated as moderate and the resulting visual impact as moderate.
COORDINATES	S 32° 34.801' E 151° 36.121'		
ELEVATION	39m		
VIEWING DIRECTION	Generally North East		
DISTANCE TO SITE	2.98km		
LCU	Paterson Rural		
VISUAL EFFECT	Low		
VISUAL IMPACT	Moderate		

5.2 Overview of Viewpoint Analysis

As discussed in the rationale for the viewpoint selection process, these viewpoints are representative of the worst case scenario. For each viewpoint, the potential visual impact was analysed through the use of a combination of topographic maps and on site analysis.

The visual sensitivity and visual effect of each viewpoint have been assessed which, when combined, result in an overall visual impact for the viewpoint (Refer to **Tables 1 and 2**). A summary of these results has been included in **Table 5**.

Of the **16** viewpoints assessed as part of this VIA, works associated with the proposal is likely be visible from **10** viewpoints. Of the **10** viewpoints from which the proposal would be visible, **3** of these has been assessed as having a low visual impact, **6** have been assessed as having a moderate visual impact and **1** was assessed as having a high visual impact.

Four of the viewpoints (***MC12, MC14, MC15 & MC16***) rated as having a moderate visual impact were located along Dungog and Gresford Road, with views across the cleared rural land towards the vegetated hills in the background.

MC01 was identified as having a moderate visual effect due to the close proximity to the proposed acoustic wall. The visual impact was rated as high due to the residential land use. Proposed landscape screening measures would significantly reduce the visual impact from residences associated with Station Street. The proposed acoustic wall is likely to be visible from Cory Street (***MC10***).

Generally, viewpoints located within close proximity to the proposal were screened by vegetation or topography, which is typical of the landscape in the area. An exception was ***Viewpoint MC07*** which was taken from the site boundary to provide a worst case view of the proposal.

Mitigation measures proposed in **Section 8.0** of this report are likely to significantly reduce the potential visual impact from these viewpoints.

VIEW-POINT	LOCATION	DISTANCE TO SITE	VISUAL SENSITIVITY	VISUAL EFFECT	VISUAL IMPACT
MC01	Station Street	15m	HIGH	MODERATE	HIGH
MC02	View Street	650m	HIGH	NIL	NIL
MC03	Dungong / Merchants Road	1.04km	MODERATE	NIL	NIL
MC04	Dungog / Horns Crossing Rd	420m	MODERATE	NIL	NIL
MC05	Lane off Dungong Road	557m	HIGH	NIL	NIL
MC06	Martins Creek Tennis Court	375m	HIGH	NIL	NIL
MC07	Vogeles Road	10m	MODERATE	MODERATE	MODERATE
MC08	Douglas Voge Road	30m	MODERATE	LOW	LOW
MC09	Douglas Voge Road	650m	MODERATE	LOW	LOW
MC10	Cory Street	45m	HIGH	LOW	MODERATE
MC11	Black Rock Road	2.66m	LOW	NIL	NIL
MC12	Dungog Road	740m	MODERATE	MODERATE	MODERATE
MC13	Gostwyck Bridge	1.55km	MODERATE	LOW	LOW
MC14	Gresford Road	2.34km	MODERATE	MODERATE	MODERATE
MC15	Gresford Road	2.52km	MODERATE	MODERATE	MODERATE
MC16	Gresford Road	2.98km	MODERATE	MODERATE	MODERATE

Please note the Viewpoint Visibility Assessment Summary is based on the visibility assessment criteria outlined in Section 2.4 of this report.
** The visual impact is likely to be reduced by mitigation methods outlined in this report.

TABLE 5: Viewpoint Visibility Assessment Summary.

6.0 Photomontages

6.1 Photomontages

Photomontages of the proposed expansion of the Site were prepared to assist in the impact assessment of the proposed rezoning. The photomontages seek to convey a visual image of the proposed site works prior to the construction of future development. Considerable effort was made to obtain photos in clear weather conditions to ensure that the photomontages would provide an accurate representation of the proposed site works, especially when viewed at a distance.

The photomontages have been developed to illustrate the loss of vegetation and areas of exposed earth resulting from the proposal. It is important to note the photomontages are based on worst case scenario without the inclusion of the proposed mitigation methods.

6.1.1 Photomontage Development Process

Photomontages are representations of the development that are superimposed onto a photograph of the Site. The process for generating these images involves computer generation of a wire frame perspective view of the Site and the topography from each viewpoint.

The photo simulations based on photography from typical sensitive viewpoints are included within the following analysis section. The images that the photo simulations have been based on have been were captured with a Canon EOS 50D Mark III Full Frame Digital SLR through a 50mm fixed focal lens which closely represent the central field of vision of the human eye. The process for photomontage development is demonstrated in the following example:

Scaled perspective view of Digital Terrain Model placed over photograph of the existing landscape showing the extent of The Site.

Photomontage developed using a light grey colour to depict clearing of land zoned for industrial use (taking into account retained trees).

FIGURE 8: Photomontage development process (Moir LA, 2013)

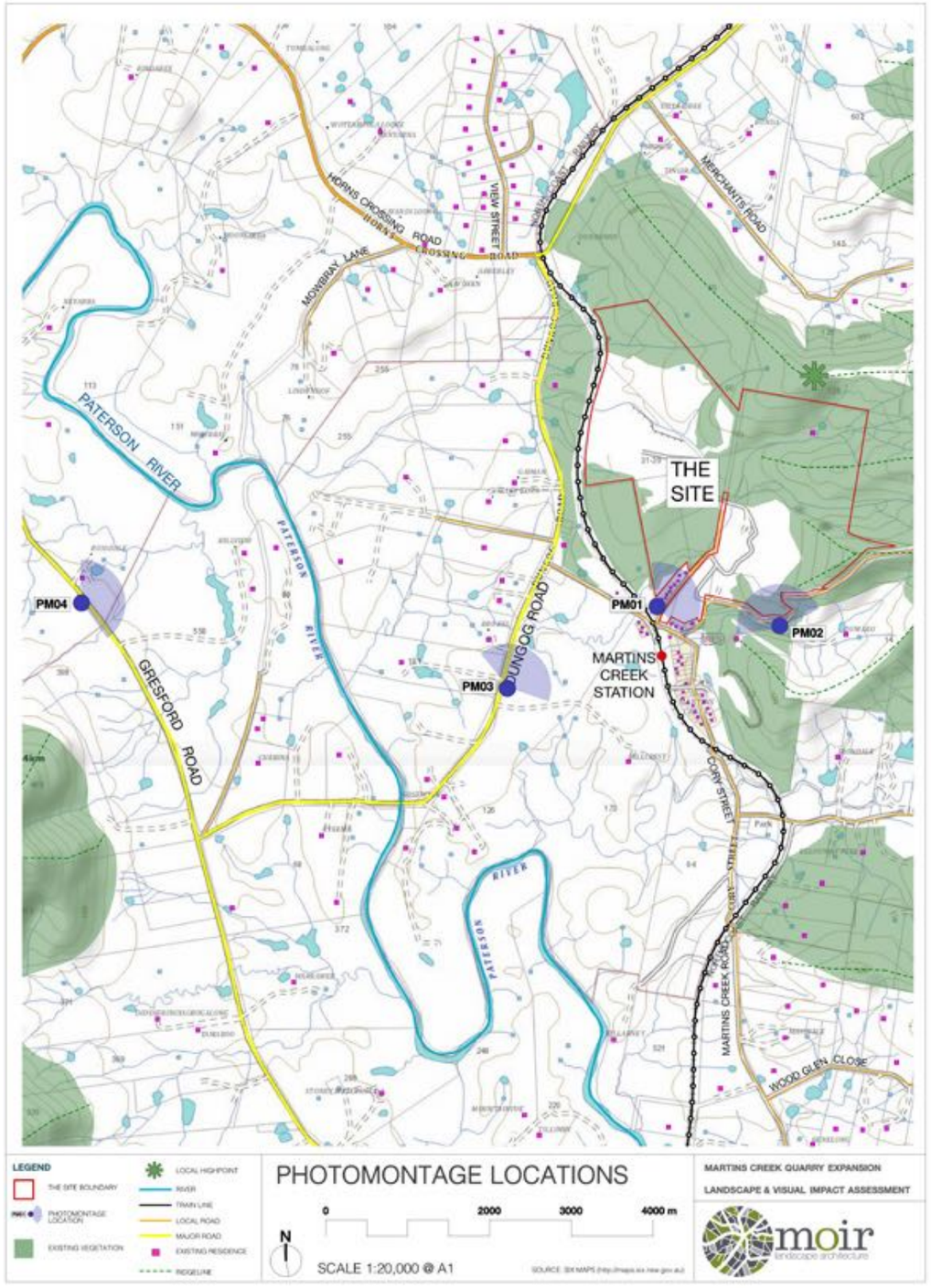


FIGURE 9: Photomontage Locations.

6.0 Photomontages

PHOTOMONTAGE 01A: Existing view from Station Street (Viewpoint MC01)

PHOTOMONTAGE 01B: Proposed view from Station Street (Viewpoint MC01)

PHOTOMONTAGE 01C: Image Zoomed and Cropped from PM01B.

6.0 Photomontages (contd.)

PHOTOMONTAGE 02A: Existing view from Douglas Voge Road (Viewpoint MC08)

PHOTOMONTAGE 02B: Proposed view from Douglas Voge Road (Viewpoint MC08)

PHOTOMONTAGE 02C: Image Zoomed and Cropped from PM02B.

6.0 Photomontages (contd.)

PHOTOMONTAGE 03A: Existing view from Dungog Road (Viewpoint MC12)

PHOTOMONTAGE 03B: Proposed view from Dungog Road (Viewpoint MC12)

PHOTOMONTAGE 03C: Image Zoomed and Cropped from PM03B.

6.0 Photomontages (contd.)

PHOTOMONTAGE 04A: Existing view from Gresford Road (Viewpoint MC15)

PHOTOMONTAGE 04B: Proposed view from Gresford Road (Viewpoint MC15)

PHOTOMONTAGE 04C: Image Zoomed and Cropped from PM04B.

7.0 Visual Impact

7.1 Assessment of Visual Impacts

7.1.1 Introduction

In addition to the viewpoint assessment the following section provides an overview of the potential visibility from local and regional areas surrounding the Site. This is by no means an exhaustive description of the visibility from every residence or locality. It is intended to provide an assessment of the potential visual impact on areas affected by the Proposal. Existing features of the landscape which contribute to the areas scenic value as well as landscape features that reduce scenic values are also discussed.

Overall, anticipated clearing to accommodate the expansion of the quarry would result in impacts on the existing surrounding environment in terms of landscape and scenic values. The visual impacts associated with the expansion will vary depending on the viewing location.

7.1.2 Visual Impact on Regional Landscape Character

Martins Creek Quarry has been operating for 100 years, since 1915. As a result, the quarry forms part of the existing landscape character. Due to the limited opportunities for unimpeded views towards the proposal, it is unlikely the proposed development would result in a significant change to the existing overall regional landscape character.

7.1.3 Visual Impact on Landscape Character

The following discussion of the potential visual impacts on the Landscape Character corresponds with the Landscape Character Units (LCUs) identified in **Section 4.0** to provide consistency throughout the document and a means of rating the level of impact.

LCU01: Mount Johnstone

Views from the Mount Johnstone LCU are expansive to the east (towards the Site), towards vegetated mountain ranges. The existing quarry appears as a small area of exposed earth in the overall vegetated mountain range.

A number of viewpoints were recorded along Gresford Road, the most publicly accessible road within the Mount Johnstone LCU. Generally, views towards the existing Quarry are available from Gresford Road through clearings in roadside vegetation. Views of the proposed quarry expansion from motorists travelling along Gresford Road are likely to be fleeting and would appear in context with the existing quarry. Rural residences sited within the LCU would potentially have views towards the existing quarry and proposed areas of expansion.

Overall, the impact on the existing landscape character within the Mount Johnstone LCU has been assessed as low - moderate. The extent of existing vegetation associated with residences may vary the degree of impact from residences with the LCU. Additionally, mitigation methods outlined in **Section 8.0** of this report would significantly reduce these potential visual impacts.

Refer to viewpoints **MC14**, **MC15, MC16 and Photomontage 04**.

LCU02: Martins Creek

Views to the proposal from areas within the Martins Creek LCU are limited. Views of the quarry are available from the site entry gates off Vogeles Road and Station Street. The existing quarry is currently concealed from residences and local roads within the Martins Creek LCU by vegetation. The proposed acoustic wall will be visible from residences along Station Street. It is likely that overtime as screen planting establishes, the visual effect would be significantly reduced. **Refer to Photomontage 01**.

Views from residences within Martins Creek associated with Cory Street are screened by vegetation and built elements in the foreground. The vegetation buffer along the site boundary will assist in screening views of the expansion from these residences. The landscape character which characterises the Martins Creek LCU will remain intact resulting to little to no change in the existing landscape character. **Refer to Photomontage 04**.

LCU03: Martins Creek Rural

Martins Creek Rural LCU is relatively inaccessible. Views from Martins Creek Road are largely contained by roadside vegetation. From most areas with the LCU views are contained by low rises in topography and scattered to dense pockets of vegetation. Although there is the potential to view the proposed expansion from areas within the LCU, this would not result in a significant change to the overall landscape character of this LCU.

LCU04: Horns Crossing

As outlined in the LCU description, dense vegetation and undulating topography characteristic of the Horns Crossing LCU contain views from roads and residences within the LCU. As a result there is unlikely to be any change to the existing landscape character of the area defined as Horns Crossing LCU.

LCU05: Paterson Rural

As outlined in the LCU description, views towards the Site from the Paterson Rural LCU are concealed by a combination of topography and vegetation. The existing landscape character of this LCU would remain unchanged.

7.2 Summary of Visual Impact

The Site is located on the western face of the hills to the north east of the Martins Creek town. The Site is generally concealed in all other directions by prominent vegetated ridges to the north, east and south.

The highest visual impact is likely to be felt from the west, where views to the existing quarry are currently available. Views are likely to be available to motorists and residences associated with Gresford Road. Rural residences located on cleared, slightly sloping land associated with the foothills of Mount Johnstone generally have expansive views to the east across the landscape towards the Site. **Photomontage 04** provides an example of the extent of the proposed expansion which is likely to be visible from Gresford Road.

Generally, due to undulating topography and existing vegetation which characterises the local area, there are limited opportunities to view the Site from areas within the immediate vicinity of the Site. A high concentration of residential development is located within close proximity to the Site (within less than 500m) associated with Martin Creek town.

Foreground vegetation and rises in topography screen views from residences associated with Station Street and Cory Street. Some loss of vegetation associated with the proposed development may be noticeable from residences close to the intersection of Grace Street and Cory Street, where land has been cleared to accommodate the existing railway siding.

The proposed access road off Dungong Road would appear in keeping with the existing access roads and driveways already existent off Dungog Road.

The quarry operations are already visible from certain viewpoints and it is undeniable that future expansion of the quarry would not make a portion of the mined face more visible.

Due to the progressive nature of the development, it is likely the visual change of the expansion would occur overtime. The highest visual impact is likely to be felt as vegetation is removed to accommodate the proposed expansion. The mitigation measures proposed in **Section 8.0** of this report seek to avoid, reduce and where possible remedy adverse effects on the visual environment arising from future development associated with the rezoning. **Figure 10** provides an analysis of the potential visual impact resulting from the proposed expansion.

The proposed acoustic wall along the eastern side of Station Street is likely to have a low - moderate visual effect from residences within close proximity due to the relatively large scale. Overtime, as proposed screen planting establishes it is likely the visual impact would be reduced.

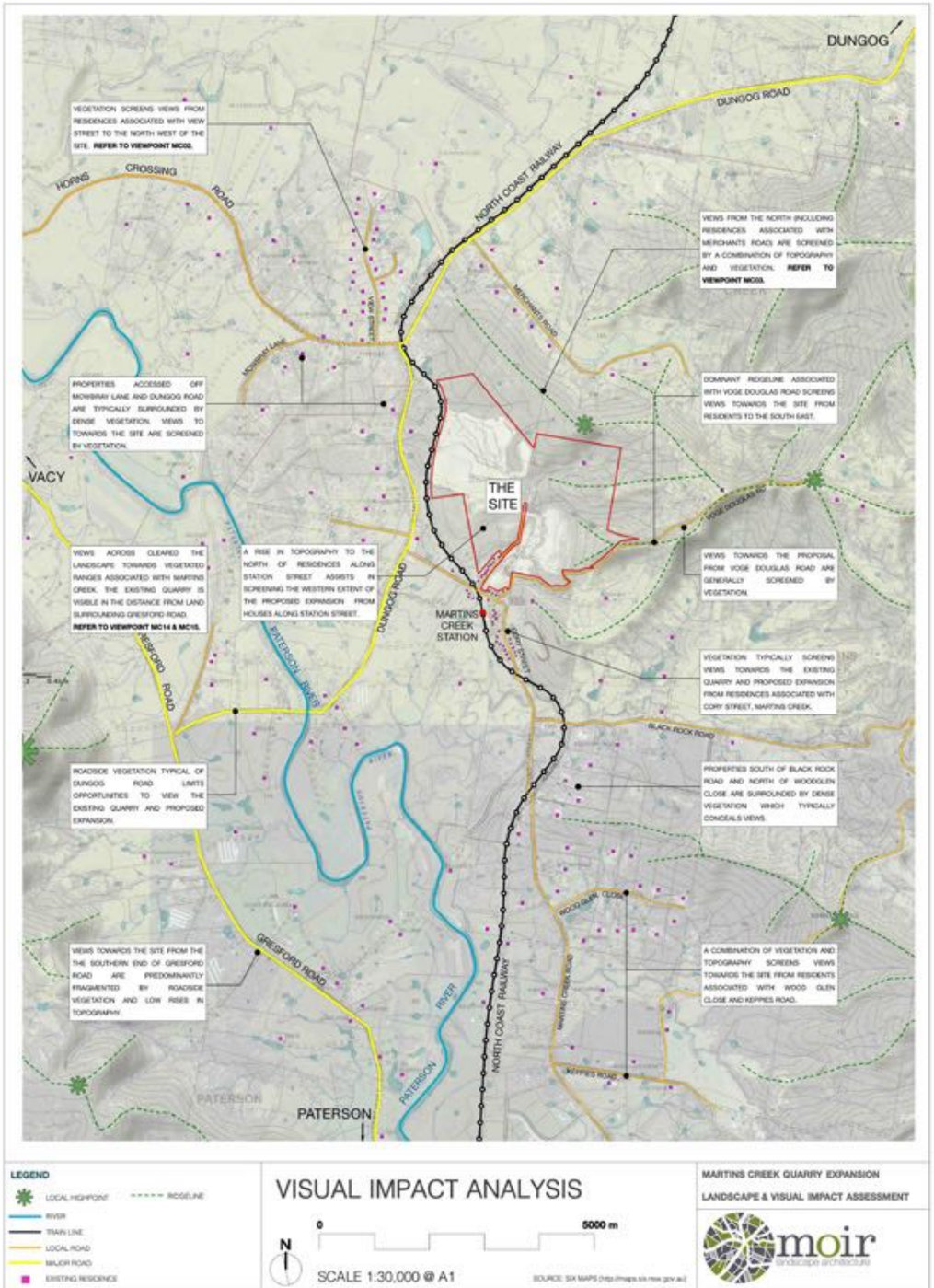


FIGURE 10: Visual Impact Analysis

8.0 Mitigation Methods

8.1 Mitigation Methods

These recommendations seek to achieve a better visual integration of the future expansion with the existing landscape character at both local and regional scales. The mitigation measures are intended to lessen the visual impact of the future expansion whilst ensuring the existing visual character of the area is not altered significantly.

This is by no means an exhaustive list however the adoption of these recommendations will assist considerably in ensuring that potential impacts are reduced.

8.1.1 Design Considerations

The general principles employed through the project design phase can significantly reduce the visual impact. These include the siting principles, access, layout and other aspects of the design which directly influence the appearance of the proposed development.

- The vegetated ridgeline and associated hills surrounding Martins Creek provide a visual backdrop to large areas of land to the west of the proposal. Significant effort should be made to ensure the tree line buffer along the ridgeline is retained.

- Physical separation and visual fragmentation of the expansion zones should be considered where possible to reduces the visual effects of merging the quarry. Retention of buffer zones between the proposed expansion areas will significantly reduce the overall impact of proposed expansion, breaking up the large areas of exposed earth.

- The preservation of pockets of existing native vegetation where possible will reduce the effects of broad scale clearing during the construction phases. This involves identifying trees that could be retained and fencing pockets unaffected by bulk earthworks.

- Proposed entry and internal roads to be positioned as closely as possible to the existing contours to minimise earthworks and allow for retention of existing vegetation where possible.

- All vegetation outside the of the required expansion footprints and unaffected by bulk earthworks should be retained and protected. The visual significance of vegetation, especially the vegetation located along the western boundary is integral in reducing the visual impacts associated within any development proposed for The Site. Vegetation contributes to the existing landscape character.

- Consideration should be given to controlling the type, height and colour of future ancillary structures and machinery materials to ensure the development does not contrast significantly with surrounding bushland.

- The progressive expansion of the quarry would reduce the immediate visual effect. If rehabilitation is to occur concurrently with the expansion of the quarry, the visual impact would be reduced significantly.

8.1.2 Rehabilitation

- Re-vegetation of degraded and disturbed areas once extraction has been completed would assist in reducing any potential visual impacts.

- The planting of vegetation endemic to the area will assist in the integrating the proposed development with the existing landscape character, in particular the large canopies which will have a positive impact in the broader view.

- Locally sourced native plant species, especially trees, should be utilised throughout the development. They help preserve the landscape character and scenic quality of the area as well as building habitat for local fauna. Native species are also well suited to local conditions (ie. soil, climate, etc.) Understorey planting will also contribute to the habitat values and screening potential of the proposed landscape works.

8.1.3 Screen Planting

Screen Planting:

The incorporation of screen planting utilising endemic plant species would significantly reduce the visual impact. There is an opportunity to include screen planting along Station Street to visually soften the proposed acoustic wall.

Residential Screen Planting:

In circumstances where residences are subject to a high level of visual impact, screen planting is an option proposed to assist in mitigating views of the proposal from residential properties. As the viewing location of the proposal would be generally fixed there is opportunity to significantly reduce potential visual impacts from the proposal.

In order to achieve visual screening planting between the intrusive element and the homestead, tree planting could be undertaken in consultation with the relevant landowners to ensure that desirable views are not inadvertently eroded or lost in the effort to mitigate views of the proposal.

9.0 Conclusion

9.1 Conclusion

With all LVIAs the objective is not to determine whether the proposed impact is visible or not visible, it is to determine how the proposal will impact on existing visual amenity, landscape character and scenic quality. If there is a potential for a negative impact on these factors it must then be investigated if and how this impact can be mitigated to the extent that the impact is reduced to an acceptable level.

It is undeniable that the proposed expansion of the extraction areas on the Site would have impacts on the landscape character of the area. However, the proposal needs to be assessed in the context of the existing operations. The existing quarry has been an element in the landscape for the past 100 years, and forms an element in the existing landscape character. The progressive nature of the development ensures the proposed changes would occur gradually and there is an opportunity to rehabilitate the landscape concurrently.

The mitigation measures proposed in **Section 8.0** of this report seek to avoid, reduce and where possible, remedy adverse effects on the environment arising from the proposed development. Implementation of the mitigation measures, which propose a combination of primary mitigation measures (tree retention, site planning principles) and secondary measures (landscaping, street trees, colour and material selections) are proposed to reduce localised negative impacts.

When implemented with appropriate environmental management and employment of the recommended mitigation measures, the future development associated with the proposed expansion could be undertaken with minimal visual impact on the surrounding environment whilst retaining the core landscape character and values.

10.0 References & Bibliography

PUBLICATIONS AND REPORTS

Australian Wind Energy Association and the Australian Council of National Trusts (2005) *Wind Farms and Landscape Values Stage One Final Report Identifying Issues.* Pirion Printers, Canberra, Australia.

Colleran, JR. & Gearing D. (1980) *A Visual Assessment Method for Botany Bay*, Landscape Australia, 3 August.

DOP (1988) *Rural Land Evaluation*, Government Printer, Department of Planning.

EDAW (Australia) Pty Ltd (2000) '*Section 12 – Visual Assessment', The Mount Arthur North Coal Project: Environmental Impact Statement*, URS Australia Pty Ltd, Prepared for Coal Operations Limited.

Horner + Maclennan & Envision (2006) V*isual Representation of Windfarms - Good Practice Guidelines*. Scottish Natural Heritage, Inverness, Scotland.

Green Bean Landscape Architects (2012), *Collector Wind Farm: Visual Impact Assessment V5*., Austral.

Matthei, L.E (1995) *Soil Landscapes of the Newcastle 1:100 000 Sheet Report*, Land and Water Conservation, Sydney

Pearson, M. & Sullivan, S. (1995) *Looking after Heritage Places*. Melbourne University Press, Victoria, Australia.

The Landscape Institute with the Institute of Environmental Management and Assessment (2008) *Guidelines for Landscape and Visual Assessment Second Edition*.

Urbis (2009) Berrybank Visual Impact Assessment - Final Report.

MAPS

2010 Google- Map data Sciences Pty Ltd, PSMA. http://map.google.com.au

Land and Property Management Authority, Spatial Information Exchange, 2010. http://six.maps.nsw.gov.au/