Appendix U – Visual impact assessment

Centennial Newstan Pty Ltd

Newstan Mine Extension Project EIS

Visual Impact Assessment

October 2019

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Terminology and abbreviations

Project terminology

Term	Description
Awaba Colliery	Awaba Colliery operates under continuing use rights and Development Consent PA 10_0038, which provides approval for: • Bord and pillar development and pillar extraction using continuous miners within the 'Main South' and 'East B' underground mining areas. • Production, handling and distribution of up to 880,000 Mtpa Run of Mine (ROM) coal using existing surface facilities. • Use of existing ancillary surface facilities. • Expansion of the existing Pollution Control Dam. • Delivery of coal to the Newstan Colliery Surface Site and/or the Eraring Power Station using the existing private haul road/transport facilities. With coal reserves exhausted, Awaba Colliery ceased operating as a producing mine in March 2012. However, the surface infrastructure is still being used as a service facility for Newstan Colliery. The existing workings within the Great Northern seam also continue to be utilised for the storage of groundwater.
Awaba Colliery Surface Site	The existing ancillary surface facilities site for the Awaba Colliery, including an administration building, workshops and car park.
Extension of Mining Area	The area within which underground mining is proposed as part of the project.
First Workings	Development of mining roadways within the coal seam that forms pillars of coal between each roadway.
Newstan Colliery	The Newstan Colliery comprises the underground workings and some associated surface facilities within the consolidated development consent boundary for DA 73-11-98. The primary activities currently authorised under DA 73-11-98 are as follows: • Extraction of up to 4 Mtpa of Run of Mine (ROM) coal from within the consolidated development consent boundary, which includes the Main West mining area and first workings within the West Borehole seam. • Pumping water from underground workings to Newstan Colliery Surface Site for recycling, reuse and discharge. • Operation of ventilation shafts, boreholes and associated overhead power lines. • Operation of a men and materials drift to the underground workings from Newstan Colliery Surface Site. • Personnel of up to 320 full time employees. • Operating 24 hours per day, seven days a week.
Newstan Colliery Surface Site	The surface facilities site for Newstan Colliery. The majority of infrastructure at the site is operated in accordance with SSD-5145 for the Northern Coal Logistics Project.
Northern Coal Logistics Project	Newstan Colliery is integrated with the Northern Coal Logistics Project, under which Northern Coal Services provides the coal handling, processing and transport facilities to deliver coal from Mandalong Mine and Newstan Colliery to domestic and export markets. These activities are approved under Development Consent SSD-5145, with facilities comprised of the Newstan Colliery Surface Site, Cooranbong Entry Site, private haul roads and rail loading infrastructure. Once ROM coal from the Newstan Colliery underground workings reaches the surface at the Newstan Colliery Surface Site, it forms part of the Northern Coal Logistics Project. The Northern Coal Logistics Project is approved to receive, handle and process up to 8 Mtpa of ROM coal, of which up to 4.5 Mtpa may be received from Newstan Colliery.

Term	Description
Northern Coal Services Pty Ltd	The company responsible for the management of the Northern Coal Logistics Project.
Partial Extraction	Bord and pillar mining where three of the four rows of pillars are extracted, leaving a spine pillar (i.e. one row of pillars) within each panel.
Project Application Area	The project encompasses three distinct areas (Newstan Colliery, the proposed Extension of Mining Area, and Awaba Colliery) which collectively form the Project Application Area. Project approval is being sought over this area. It will form the project boundary following SSD approval.
Study area	The specific study area relevant and appropriate to each technical impact assessment study.
The project	Newstan Mine Extension Project
The proponent	Centennial Newstan Pty Ltd (Centennial Newstan)
Total extraction	Bord and pillar mining where all pillars in a panel are removed.

Visual impact assessment terminology

Terminology	Definition
Impact	The effect of a proposal, which can be adverse or beneficial, when measured against an existing condition.
Landscape character	The combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place.
Landscape character type	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately adjacent.
Magnitude	The measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer. Combined with sensitivity, magnitude provides a measurement of impact.
Sensitivity	The sensitivity of a landscape character type or view and its capacity to absorb change. In the case of visual impact this also relates to the type of viewer and number of viewers. Combined with magnitude, sensitivity provides a measurement of impact.
View	The sight or prospect of a landscape or scene.
Viewshed / Visual Envelope	A visual envelope, also referred to as ‘viewshed’ or ‘visual catchment’, is the extent of the area within which a project that can be seen at eye level above ground. Its extent will usually be defined by vegetation, landform and built elements.
Visibility	The state or fact of being visible or seen.
Zone of Theoretical Visibility (ZTV)	Zone of Theoretical Visibility (ZTV), also known as a Zone of Visual Influence (ZVI), is a computer-generated tool to identify the theoretical extent of visibility of a project. The elevation of the project is tested against a 3D terrain model.

Acronyms, abbreviations and definitions relevant to the Newstan Mine Extension Project EIS are presented below.

Standard acronyms and abbreviations

Acronym/abbreviation	Definition
AHD	Australian Height Datum
°C	Degrees Celsius
Centennial Coal	Centennial Coal Company Limited
Centennial Newstan	Centennial Newstan Pty Ltd
CEMP	Construction Environmental Management Plan
EIS	Environmental Impact Statement
EPL	Environment Protection Licence
EP&A Act	*Environmental Planning and Assessment Act 1979*
GIS	Geographic Information System
IPC	Independent Planning Commission
LEP	Local Environmental Plan
LGA	Local Government Area
m	metres
mm	millimetres
NSW	New South Wales
ROM	Run of Mine
SEARs	Secretary's Environmental Assessment Requirements
VIA	Visual Impact Assessment
ZTV	Zone of Theoretical Visibility

Government departments

Government Department	Acronym / abbreviation
Biodiversity Conservation Division	BCD
Department of Industry - Crown Lands	DoI - Crown Lands
Department of Planning Industry and Environment	DPIE
Department of Primary Industries – Forestry	DPI - Forestry
Department of the Environment and Energy	DotEE
Division of Resources and Geoscience	DRG
Lake Macquarie City Council	LMCC
National Parks and Wildlife Service	NPWS
Natural Resources Access Regulator	NRAR
NSW Environment Protection Authority	EPA
NSW Rural Fire Service	RFS
Roads and Maritime Services	RMS
Transport for NSW	TfNSW

1. Introduction

1.1 Project overview

Newstan Colliery is an existing underground coal mine located in the Lake Macquarie Local Government Area (LGA), approximately 25 kilometres south west of Newcastle and 140 kilometres north of Sydney, NSW. It is owned and operated by Centennial Newstan Pty Ltd (Centennial Newstan).

Mining operations at Newstan Colliery began in 1887 and upon the introduction of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) operated pursuant to continuing use rights in accordance with Part 4, Division 10 of the EP&A Act (continuing use rights).

Newstan Colliery has at various times mined the upper coal seams (Great Northern and Fassifern seams) and lower coal seams (West Borehole, Borehole, Young Wallsend and Yard seams) and produced both semi-soft coking coal and thermal coal for the domestic and export markets. In the lower seams, workings to date have been concentrated to the west of the seam split, which is a defining geological feature of the mine. Mining has been undertaken using a combination of bord and pillar and longwall mining.

In August 2014, the underground operations at Newstan Colliery were placed onto care and maintenance due to poor market conditions. In recent years, Centennial Newstan has commenced feasibility investigations into the recommencement of mining at Newstan Colliery. The most recent modification to DA 73-11-98 in January 2019, permits first workings mining within the West Borehole seam in the southern portion of the Newstan Colliery mining lease area. The first workings aim to improve Centennial Newstan's understanding of the geology within the West Borehole seam, including the presence, throw and strike of a major fault zone projected from the historic Newstan workings.

Centennial Newstan is now seeking approval for the continuation of mining within the West Borehole seam. The Newstan Mine Extension Project proposes to extract up to 25.9 million tonnes (Mt) over a fifteen year period at a maximum production rate of 4 million tonnes per annum (Mtpa) of Run of Mine (ROM) coal. Bord and pillar mining is proposed using continuous miner methods that will include areas of first workings, partial extraction and total extraction. A mix of metallurgical and thermal coal is proposed to be extracted. ROM coal will be delivered to the Newstan Colliery Surface Site via a series of existing underground conveyors. Once the coal reaches the Newstan Colliery Surface Site it will be handled in accordance with the approved operations for the Northern Coal Logistics Project (SSD-5145), managed by Centennial Coal's Northern Coal Services business unit.

Other key features of the project include:

- Utilisation of the Newstan Colliery Surface Site to provide parking, bathhouse, administration and workshop facilities for the underground workforce. A small number of administrative, maintenance and monitoring personnel will also be located at Awaba Colliery Surface Site.
- Transportation of personnel and materials to and from the underground mining area via the existing men and materials drift at Newstan Colliery Surface Site.
- Continued operation of the two existing ventilation fans at Newstan Colliery Surface Site and the installation and operation of two new ventilation fans at the existing ventilation shaft at Awaba Colliery Surface Site.

- In-seam gas drainage, with gas transferred to a new gas flaring facility to be located within the existing disturbance footprint of Awaba Colliery Surface Site.
- Extraction of underground water via the existing Fassifern Pump Station at Newstan Colliery Surface Site and ongoing groundwater management in accordance with Centennial Coal's Northern Operations Water Management Plan.

The project is aligned with the broader Centennial Coal business strategy in that it facilitates the development of a new semi-soft coking coal product stream and a thermal coal product for both the domestic and export markets. The project will enable supply of export coal products while meeting contractual coal supplies to the domestic markets. Over time, the project can potentially replace the coal product currently supplied to the domestic market by other Centennial operations as these other resources become depleted. This will ensure ongoing security of supply for domestic electricity generation.

If approved, the project will allow for the optimisation of resource recovery from Newstan Colliery while providing ongoing direct and indirect employment opportunities. In addition, the project will provide several positive flow-on effects to the local, regional and State economies through additional wages and royalties.

1.2 Purpose and scope of this report

This Visual Impact Assessment (VIA) has been prepared by GHD on behalf of Centennial Newstan. The purpose of this report is to determine the visual impact of the Newstan Mine Extension Project in response to the key issues identified in the Secretary's Environmental Assessment Requirements (SEARs) and to support the Environmental Impact Statement (EIS), to investigate potential impacts of the project. The relevant issues identified in the SEARs include:

- 'Visual – including a detailed assessment of the likely visual impacts of the development on private landowners in the vicinity of the development and key vantage points in the public domain'.

1.3 Applicable guidelines

To the extent practical, the visual impacts of the project have been assessed in accordance with the following guidelines:

- *Environmental Impact Assessment Practice Note EIA-N04 - Guideline for Landscape Character and Visual Impact Assessment, Version 2.1 (Roads and Maritime Services, 2018)*
- *Guidelines for Landscape and Visual Impact Assessment,* 3rd Edition (Landscape Institute and Institute of Environmental Management & Assessment, 2013).

1.4 Overview of methodology

The following tasks were undertaken for the visual impact assessment:

1. ***Assessment of existing visual environment***

- Desktop review of existing information, and collation of relevant background information including planning and statutory requirements, topography, land use and vegetation.
- Mapping of the mine extension including ZTV mapping for the 20m (TBC) high ventilation fan 'fan house' building, and identification of sensitive visual receivers (road users, residents, etc.) within the viewsheds.
- Evaluation of the existing visual environment, and assessment of sensitivity of visual receivers, to assess public and private sensitive receiver locations within the project surrounds.

2. ***Assessment of visual impacts***

- Description of the visible elements of the project (during both the operation stages), and identification of potential impact generators
- Assessment of the magnitude of change resulting from the project that will be likely to affect the identified sensitive visual receivers
- Subsequent determination of impact significance based on ratings of receiver sensitivity and impact magnitude. Impact significance will be rated against a qualitative impact scale.

1.5 Report structure

The report is comprised of the following sections:

Section 1 - Introduction: provides background information and an overview of the Project and assessment

Section 2 - Methodology: describes the methodology used for the purposes of this assessment

Section 3 - Project Description: provides a description of the project components most relevant to this assessment

Section 4 - Existing Environment: provides an overview of relevant legislation and policy and describes the landscape and visual environment within the project study area. Viewpoint locations are identified.

Section 5 - Impact Assessment: provides an assessment of impacts to visual environment from the Project

Section 6 - Conclusion: presents a summary of findings.

2. Methodology

The following is an overview of the methodology adopted for the visual assessment.

2.1 Existing visual environment

2.1.1 Desktop analysis

A review of key planning designations, policies and guidance was undertaken in relation to the visual environment within and surrounding the Project Application Area. The emphasis of the review was to identify elements outlined in legislation, policy and planning documents relevant to the visual character and identity of the study area (refer to section 4.1).

Existing environment data and project information was gathered and reviewed, including:

- Project design information and site photographs
- topography, land use, and vegetation maps
- Google Earth and Google Street View

Using this data, a preliminary assessment of the visual environment was undertaken to inform the site inspection.

2.1.2 Zone of Theoretical Visibility assessment

Zone of Theoretical Visibility (ZTV) mapping is a computer-generated analysis which identifies land from which it is theoretically possible to view the components of the project. ZTV mapping has been used primarily to guide the area of site analysis and representative viewpoint selection.

ESRI ArcGIS software was used to model the ZTV of the project. A one metre resolution digital elevation model was obtained from NSW Government Spatial Services data and used to calculate the ZTV. The ZTV was mapped using the following parameters:

- A viewing height of 1.7 metres, which is the average within the typical viewing level range of an adult.
- The indicative levels for the top of proposed fan house building.
- The GIS software then digitally determined the likely extent over which the feature would be visible or not visible. In interpreting the ZTV, the following issues were considered:
  - the software only considers the landform and does not include land cover factors such as the presence of buildings and trees, therefore it represents the worst-case scenario of potential visual impacts.
  - the software does not take into account the effect of distance. The greater the distance from the project, the lower the impact, as the development would take up a smaller portion of the view, and atmospheric conditions may reduce the visual prominence of the project.
  - the ZTV is only accurate to the resolution of the elevation model.

2.1.3 Site inspection

A site inspection was undertaken by a Landscape Architect on 22nd August 2019. The purpose of the inspection was to:

- Identify sensitive visual receiver locations.

- Inspect the site and appreciate views to / from sensitive visual receivers.
- Inspect publically accessible locations identified during the desktop analysis as likely to provide views of the project, including roads, footpaths, station entry points, and platforms.
- Take photographs for preparation of photographic panoramas. The coordinates of each viewpoint and photograph were recorded during the site inspection.

2.1.4 Definition of existing visual environment

An assessment of existing visual conditions was undertaken to establish the key views, viewsheds, topography, vegetation and other visual features relevant to the project. Refer to section 4.3 for an assessment of the existing visual environment.

2.1.5 Viewpoint selection

Assessment of visual impacts deals with the effects of change and development on the views available to people and their visual environment. It assesses how the surroundings of individuals or groups of people may be affected by changes in the context and character of views. Such changes include a modification to or loss of existing elements of the landscape and/or the introduction of new elements.

Visual receivers were considered in terms of the views they are likely to have of the project from within the study area including consideration of any key vantage points, such as lookouts, where there is particular interest in the view. Visual receivers were identified based on:

- Proximity of the receivers to the project, as the most affected visual receivers are anticipated to be located closest to the Proposal, unless located at an elevated vantage point.
- Type of receiver, as different viewer types would have different perceptions of the change.

Based on the analysis of the existing visual environment, sensitive visual receivers were identified and viewpoint locations selected as representative locations for assessment.

Refer to section 5 for sensitive visual receivers and viewpoint locations.

2.2 Impact assessment

2.2.1 Visual effects

The evaluation of potential impacts on the visual environment is based on the sensitivity of the viewpoint (and the visual receiver it represents) to change, and the magnitude of change that is likely to occur.

The sensitivity of each viewpoint is considered to be dependent on:

- The importance of the view, its existing scenic qualities and the presence of other existing man-made elements in the view.
- The type of visual receiver and their likely interest in the view.

The magnitude of change to views and the visual environment depends on the nature, scale and duration of the change that is expected to occur. The magnitude of a change also depends on the loss, change or addition of any feature in the field of view of the receiver including the level to which the change contrasts with the existing view or expected view of the landscape. This includes the degree of any change to the backdrop to, or outlook from a viewpoint.

The assessment considers the likely impacts of the project. The effect on a view depends on factors such as the extent of visibility, degree of obstruction of existing features, degree of contrast with the existing view, angle of view, duration of view and distance from the project.

The steps that were undertaken to assess the visual effects of the project included:

- Identifying and mapping viewpoint locations.
- Undertaking an assessment of visual effects, comprising:
  - sensitivity of visual receivers to proposed change, based on: susceptibility of visual receivers to change, and value attached to views (refer Table 2-1)
  - magnitude of visual effect, based on: size or scale of change; geographical extent of effects, and duration and reversibility of effects (refer Table 2-2).

An assessment was undertaken of the overall level of significance of the visual effects from the project in relation to the existing view (refer section 2.2).

Table 2-1 Sensitivity criteria (visual)

Rating	Criteria
High	Occupiers of residential properties within close proximity to the proposed development, at home or going to or from, with long viewing periods. Communities that place value upon the urban landscape and enjoyment of views of their setting.
Moderate	Outdoor workers who have a key focus on their work who may also have intermittent views of the study area; Viewers at schools, or similar, when outdoor play and recreation areas are located within close proximity but viewing periods are limited; Occupiers of residential properties with long viewing periods, at a distance from or screened from the study area.
Low	Road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the study area and therefore have short term views; Viewers indoor at their place of work, schools or similar.
Negligible	Viewers from locations where there is screening by vegetation or structures where only occasional screened views are available and viewing times are short; Road users in motor vehicles, trains or on transport routes that are passing through/adjacent to the study area and have partially screened views and short viewing times.

Table 2-2 Magnitude of change criteria (visual)

Rating	Criteria
High	A substantial/obvious change to the existing view due to total loss of, or change to, elements, features or characteristics of the view. Would cause a view to be permanently changed and its quality diminished.
Moderate	Discernible changes in the existing view due to partial loss of, or change to elements, features or characteristics of the view, however has potential to be partly mitigated. The change would be out of scale with the existing view, and would leave an adverse impact on the view.
Low	Minor loss or alteration to one or more key view elements, features or characteristics, or the introduction of components that may be visible but may not be uncharacteristic within the existing view.
Negligible	Almost imperceptible or no change in the view as there is little or no loss of/or change to the elements, features or characteristics of the view.

2.2.2 Significance of impacts

The combination of sensitivity and magnitude determines the significance of the impact on the landscape character or representative viewpoint. Refer Table 2-3 for the matrix used to determine the significance of impact.

Table 2-3 Significance of impact matrix

Sensitivity	Magnitude of impact				
	High	Moderate	Low	Negligible	
High	High Impact	High-Moderate	Moderate	Negligible	
Moderate	High-Moderate	Moderate	Moderate-Low	Negligible	
Low	Moderate	Moderate-Low	Low	Negligible	
Negligible	Negligible	Negligible	Negligible	Negligible	

2.2.3 Panorama and photography

All photographic images were captured using a 50 millimetre fixed focal length lens on a 35 millimetre full frame format camera at a camera height of 1.6 metres. All photograph locations were recorded and mapped.

A series of four viewpoint locations were chosen and existing views represented using a panorama technique. This technique involves the stitching together of a number of adjoining images using the Adobe Photoshop software program.

2.3 Assumptions

This methodology includes the following assumptions and limitations:

- There is no national guidance on the assessment of landscape and visual impacts specific to Australia, however in NSW, the industry typically refers to Guidelines for Landscape and Visual Impact Assessment, Third Edition (2013), and Environmental Impact Assessment Practice Note EIA-N04 - Guideline for Landscape Character and Visual Impact Assessment, Version 2.1 (Roads and Maritime Services, 2018). As mentioned above, these guidelines have been considered for the purposes of this assessment.
- The assessment aims to be objective and describe any changes factually. While potential changes resulting from the project are defined, the significance of these changes requires qualitative (subjective) judgements. This assessment's conclusion therefore combines objective measurement and professional interpretation. While this assessment aims to be objective, it is recognised that visual impact assessment can be subjective and individuals are likely to associate different visual experiences to the study area
- Existing conditions were assessed during the site inspection on 22 August 2019.

3. Project description

3.1 Project location

The project is located 20 kilometres south-west of Newcastle, NSW. It is located in an undulating and forested landscape, with existing coal mining industry, infrastructure and rural townships.

The majority of the project is underground, with two surface sites:

- Awaba Colliery Surface Site, located 1 km south-west of the small rural township of Awaba.
- Newstan Colliery Surface Site, located 1.5 km north-west of Fassifern township (not part of this assessment as no surface works are proposed).

3.2 Project description (surface works only)

The project is primarily underground and this assessment is focussed on the proposed upgrades to the existing Awaba Colliery Surface Site. This is the most visible component of the project, in terms of the extent and nature of the potential visual significance of the proposed surface infrastructure on surrounding areas.

3.2.1 Awaba Colliery Surface Site

The project proposes the ongoing use and upgrade of the surface infrastructure at Awaba Colliery Surface Site in addition to the construction and operation of a number of new facilities. The following activities are proposed at Awaba Colliery Surface Site as part of the project. Refer to Figure 3-2.

- Installation of three new ventilation fans and fan house buildings, to a maximum height of 20m. The proposed fan house and ventilation fans will be the highest new structure on site. An example is shown in Photograph 3-1.
- A gas flaring facility within the existing disturbance footprint of the site (maximum height of 10m). An example is shown in Photograph 3-2.
- Water tank and cooling tower (maximum height of 6m).
- Pumps area (maximum height of 4m).
- Ongoing use of the administration offices and parking facilities.
- Upgrade and ongoing use of the underground water supply and communications infrastructure.
- Other ancillary sheds, compounds, boreholes, stockpile areas and connections.

3.2.2 Forest Road Ballast borehole and services site (not part of this assessment as no surface works are proposed)

A small ballast borehole and services site is located approximately 1 km north of Awaba township, off Forest Road. The purpose of the site is to provide access for bulk materials such as ballast. It has been assumed that there will be minimal change to the visual characteristics of this site, therefore it has not been included in this assessment.

3.2.3 Newstan Colliery Surface Site (not part of this assessment)

The project proposes the ongoing use of some existing infrastructure at the Newstan Colliery Surface site. It has been assumed that there will be minimal change to the visual characteristics of this site, therefore it has not been included in this assessment.

Photograph 3-1 Example of triple vertical ventilation fans and housing

Photograph 3-2 Example of gas flares

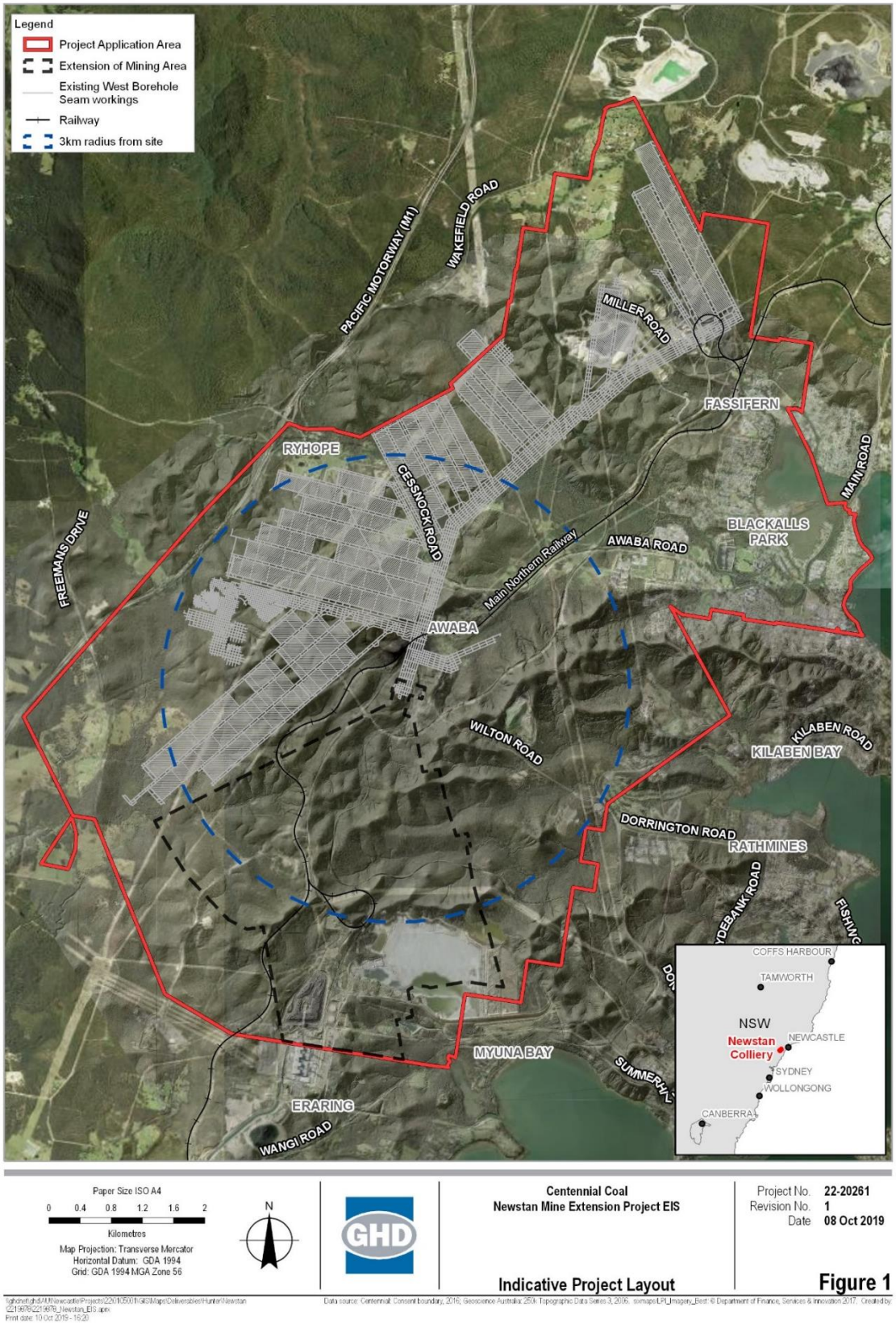


Figure 3-1 Project location plan

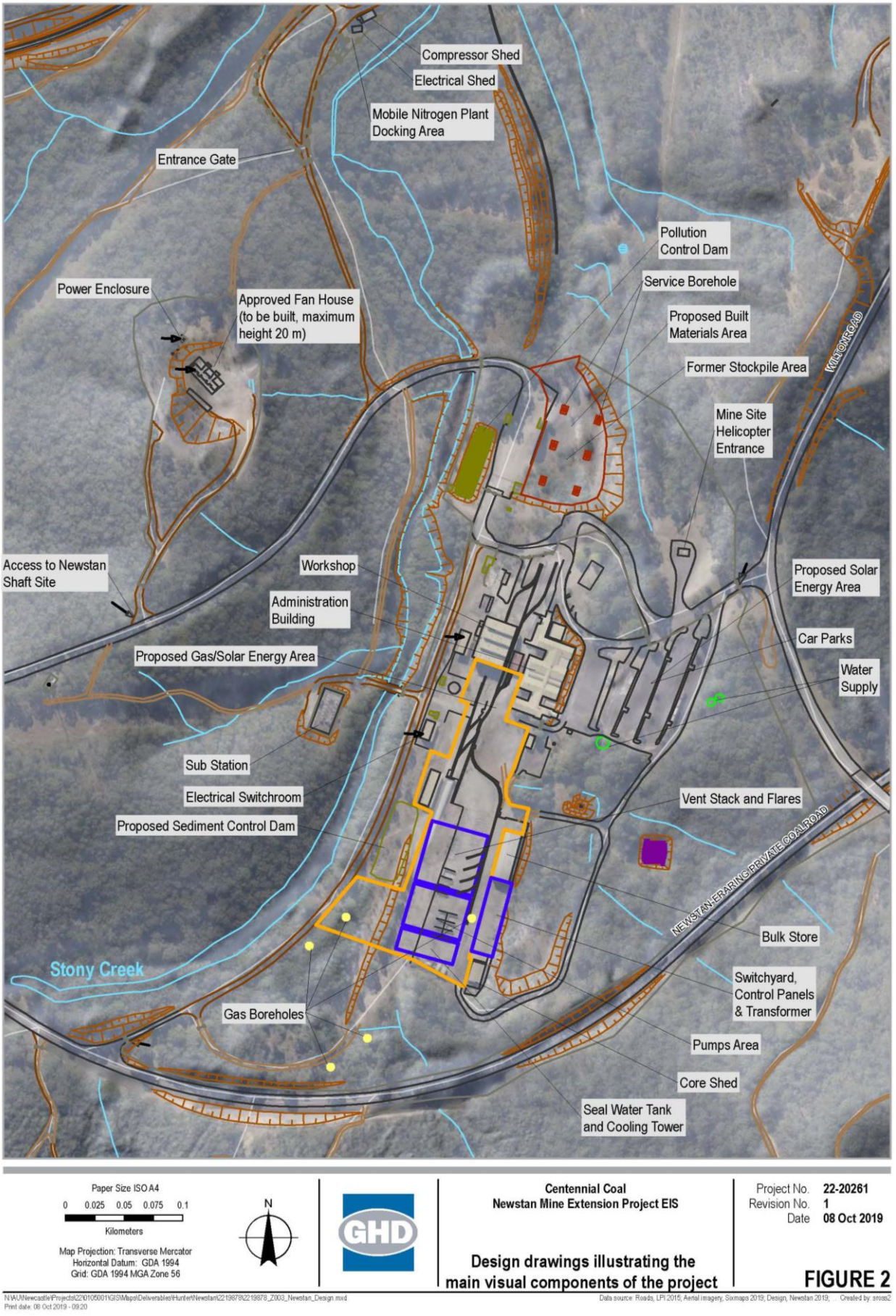


Figure 3-2 Awaba Colliery Surface Site components plan

4. Existing environment

The following section provides an overview of relevant legislation and policy objectives, land use and built form, topography, hydrology and vegetation, and key views and viewsheds in the vicinity of the project site. These features all contribute to the visual environment of the study area.

4.1 Study area

The study area for the VIA was defined as publically accessible land within approximately three kilometres of Awaba Colliery Surface Site, as shown in Figure 4-1. The study area has been determined based on the following:

- An analysis of the ZTV mapping (refer section 2.1.2)
- A desktop study examining aerial photographs and topographic maps considering both landform, land cover, land use, settlement patterns and vegetation
- A site inspection examining the existing visual catchment
- Previous studies of a similar nature

4.2 Summary of legislation and policy

Table 4-1 provides a summary of the key legislation and policy objectives relevant to this assessment.

Table 4-1 Summary of legislation and policy

Legislation / Policy	Topic	Relevant Features / Objectives
Lake Macquarie Scenic Management Guidelines 2013	Scenic amenity management	*'…Retain existing ridgeline and hillside vegetation which provides a dominant backdrop to views from surrounding key viewpoints'* **From Scenic Management Zone 11: Wakefield Area**
	Building height	*'…building and structure height does not extend above the physical ridgeline, not the tree-line;* **From Scenic Management Zone 11: Wakefield Area**
	Vegetation	*'…opportunities to rehabilitate any degraded areas are identified'.* **From Scenic Management Zone 11: Wakefield Area**
Lake Macquarie Local Environmental Plan 2014	Scenic and aesthetic qualities	*'…To encourage development that is sympathetic to the scenic, aesthetic and cultural heritage qualities of the built and natural environment'.* **(However this is only applicable in Zone R2 Low Density Residential areas, ie. where the views are taken from)**
	Land use **SP1 Mining Special Activities Zone**	*'…To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land'.*

Legislation / Policy	Topic	Relevant Features / Objectives
	Land use **R2 Low Density Residential Zone**	*'…To encourage development that is sympathetic to the scenic, aesthetic and cultural heritage qualities of the built and natural environment'.*
	Land use **E2 Environmental Conservation Zone**	*'…To protect, manage and restore areas of high … aesthetic values …To prevent development that could destroy, damage or otherwise have an adverse effect on those values'.*
Lake Macquarie Development Control Plan 2014		*'…To ensure that the scenic values of the City are protected and enhanced. To ensure that developments visible or adjoining the coastline, Lake Macquarie or ridgelines maintain and enhance the scenic value of these features'.* This document refers to the Scenic Management Guidelines, 2013.
Newcastle Metropolitan Plan	Landscape setting	*'…Lake Macquarie, its waterfront and the coastline will be protected from encroachment of development that impacts open space and diminishes the natural landscape setting'.*
Crown Land Management Act 2016	Scenic qualities	*'…that the natural resources of Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible'.*

4.3 Landscape and visual existing environment

The following section provides a general description of the study area.

4.3.1 Land use and built form

The Awaba Colliery Surface Site is located in a valley, within an undulating landscape that has dense and mature tree cover. The land is predominantly characterised by areas of native tree cover extending beyond existing mining operations. The land use within the Project Application Area includes a range of large-scale industrial activities related to underground mining and power generation.

Other large-scale industrial developments are located nearby, notably Eraring Power Station, which is located four kilometres to the south, and has two tall chimney stacks that are often visible above the horizon.

The closest populated urban centres are the Awaba township, approximately one kilometre to the north. There are industrial areas three kilometres to the north-east, on the outskirts of Toronto and denser urban development six kilometres to the south-east, fringing Lake Macquarie.

The rural township of Awaba is comprised of primarily low-density residential areas, centred around a small train station, two schools, a sports oval and other community facilities. Awaba is surrounded by dense vegetation of typically 20m high native trees.

The nearest privately-owned residences are identified at over 500m to the north-east on Olney Street and 750m at the corner of Wilton Road and Sydney Street (note: distances are measured from the highest proposed vertical element to the nearest edge of the residential building).

Regional features of note include Lake Macquarie to the east, M1 Pacific Motorway to the north-west and the Watagans National Park to the west (refer to Figure 3-1).

4.3.2 Landscape, topography and hydrology

The Awaba Colliery Surface Site is located in a depression, surrounded by an undulating landform. Stony Creek runs through the base of the valley and dissects the Awaba Colliery Surface Site. Other smaller drainage lines are located perpendicular to the creek, in the hill inclines.

There is a dominant ridgeline one kilometre to the north, parallel to the Main Northern Railway, with rural residential properties extending along the hillside. There are also a number of discontinuous ridgelines with spurs descending towards drainage lines (refer to Figure 4-1).

4.3.3 Vegetation

Vegetation within the study area is typically dense, native, eucalypt forest of approximately 20m height.

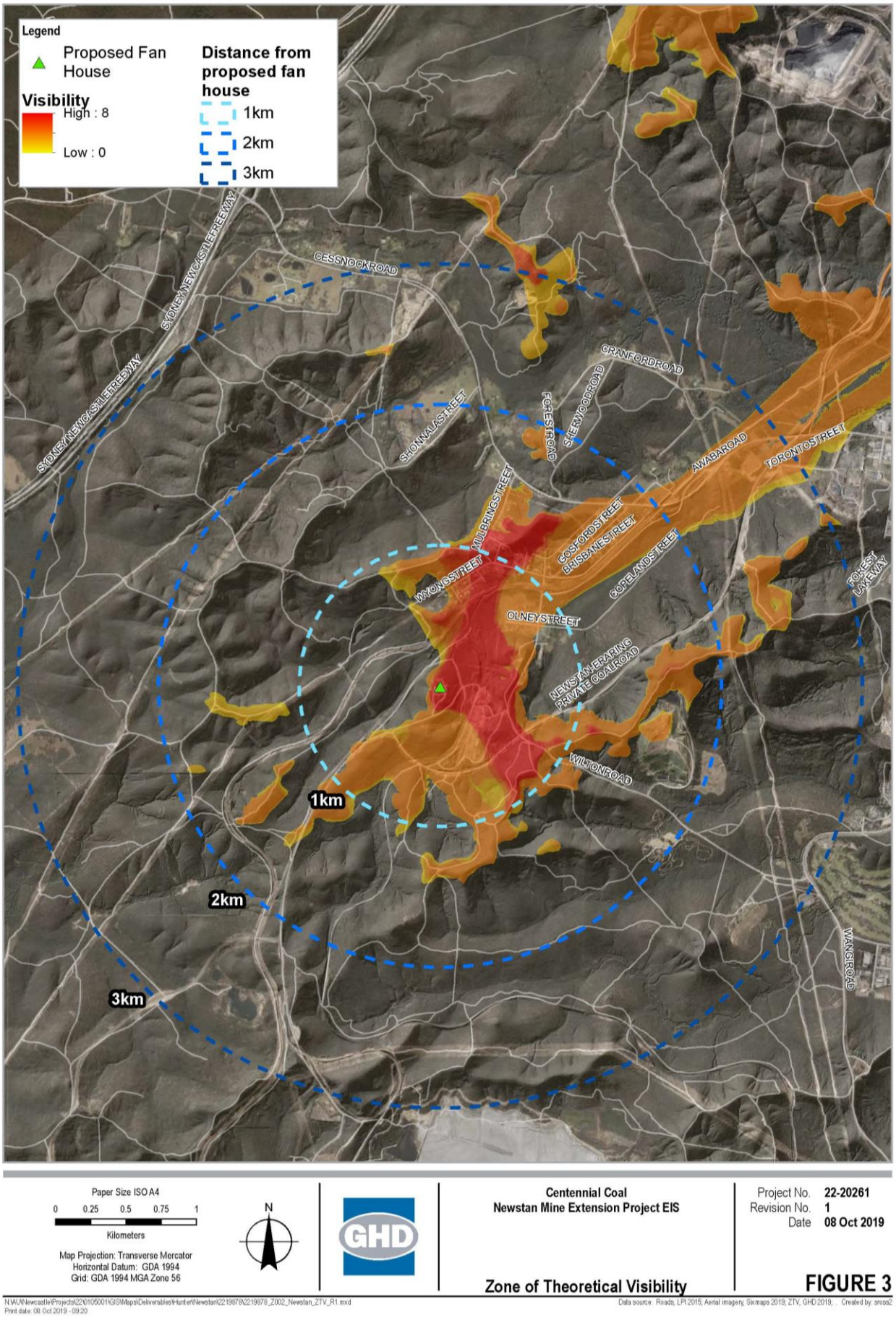


Figure 4-1 Topography and ZTV

4.3.4 Key visual elements

Due to the undulating topography and forest vegetation, much of the existing mining infrastructure is screened. Long views are typically to forested ridgelines.

The Eraring Power station is a key visual element. The two grey concrete stacks are taller than 100 m in height and are much higher than the surrounding forest canopy of approximately 20 m height. They are visible from elevated locations in the Awaba township.

4.3.5 Zone of Theoretical Visibility analysis

ZTV mapping undertaken for the proposed fan house buildings revealed some visibility of the project from the surrounding area, as shown in Figure 4-1. However, this mapping does not take into consideration the presence of the dense and tall forest vegetation.

The entrance to the Awaba Colliery on Wilton Road may also offer a viewing opportunity, as illustrated in Photograph 4-1; however the view would be from a vehicle, travelling at high speed around a corner and with vegetation screening the foreground. It would be a very short viewing duration and a glimpse through mature vegetation. Therefore this viewpoint was not considered as a sensitive visual receiver, as shown in Figure 4-2.

Photograph 4-1 Awaba Colliery entrance, looking west from Wilton Road

Photograph 4-2 VP5 - Corner Sydney Street, looking south down Wilton Road

4.4 Sensitive visual receivers and viewpoints

This visual impact assessment has been undertaken to determine the likely visual significance of the project on people living and working in, or travelling through, the surrounding landscape.

Based on the existing environment analysis, sensitive visual receivers were identified and viewpoint locations selected for assessment.

4.4.1 Sensitive visual receivers

Sensitive visual receivers within the project viewshed are limited to the following:

- Some (approx. 15) residential properties in the Nelinda Street/Dora Street/Adelaide Street area, Awaba.
- Commuters and pedestrians using Awaba Station footbridge.
- Road users on Wilton Road, travelling south near Sydney Street, Awaba.
- Road users on Wilton Road, travelling north from the Awaba Waste Transfer Station.

4.4.2 Viewpoint locations

Table 4-2 and Figure 4-2 identify representative viewpoints for assessment of views from the most sensitive visual receivers.

Table 4-2 Viewpoint locations

Viewpoint	Location	Description
VP1	Awaba Station footbridge	This elevated view is representative of pedestrians using the Awaba train station footbridge, crossing over the train line.
VP2	Awaba Oval	This view is representative of Awaba Oval pedestrians and Olney Street residents.
VP3	Awaba Waste Transfer Depot and community recycle centre 367 Wilton Rd	This view is representative of drivers along Wilton Road, including those exiting the Awaba Waste Transfer and Community Recycling Centre.
VP4	Nellinda Street Residential area	This elevated view is representative of residents and pedestrians on Nellinda Street and the north end of Dora Street, with views towards the station, township and project.

4.4.3 Other viewing locations

Other viewing locations were considered, but not assessed in detailed due to their distance from the project and/or the limited viewing opportunities, which rendered potential visual impacts negligible. Refer to Table 4-3 for an outline of other viewing locations.

Table 4-3 Other viewing locations

Viewpoint	Location	Description
VP5	Corner of Sydney Street and Wilton Road	This view is representative of road users travelling south on Wilton Road.
VP6	Wilton Road at the Bridge over Newstan Eraring Private coal road	This view is representative of a road user's views from the Wilton Road bridge.
VP7	Watagans National Park Off Mt Faulks Rd	This view is representative of visitors to Watagans National Park
VP8	Dora Street looking south-east	This view is representative of residents to the northern end of Dora Street. It was considered to be a similar view to Viewpoint 4.

The following photographs show other viewing locations that were considered but not assessed.

Photograph 4-3 VP5 - Corner Sydney Street, looking south down Wilton Road

Photograph 4-4 VP6 - Wilton Road at the Bridge over Newstan Eraring Private coal road, looking north-west

Photograph 4-5 VP7 - From within Watagans National Park near Mt Faulk Road

Photograph 4-6 Dora Street, looking south-east (a similar view is represented in VP4)

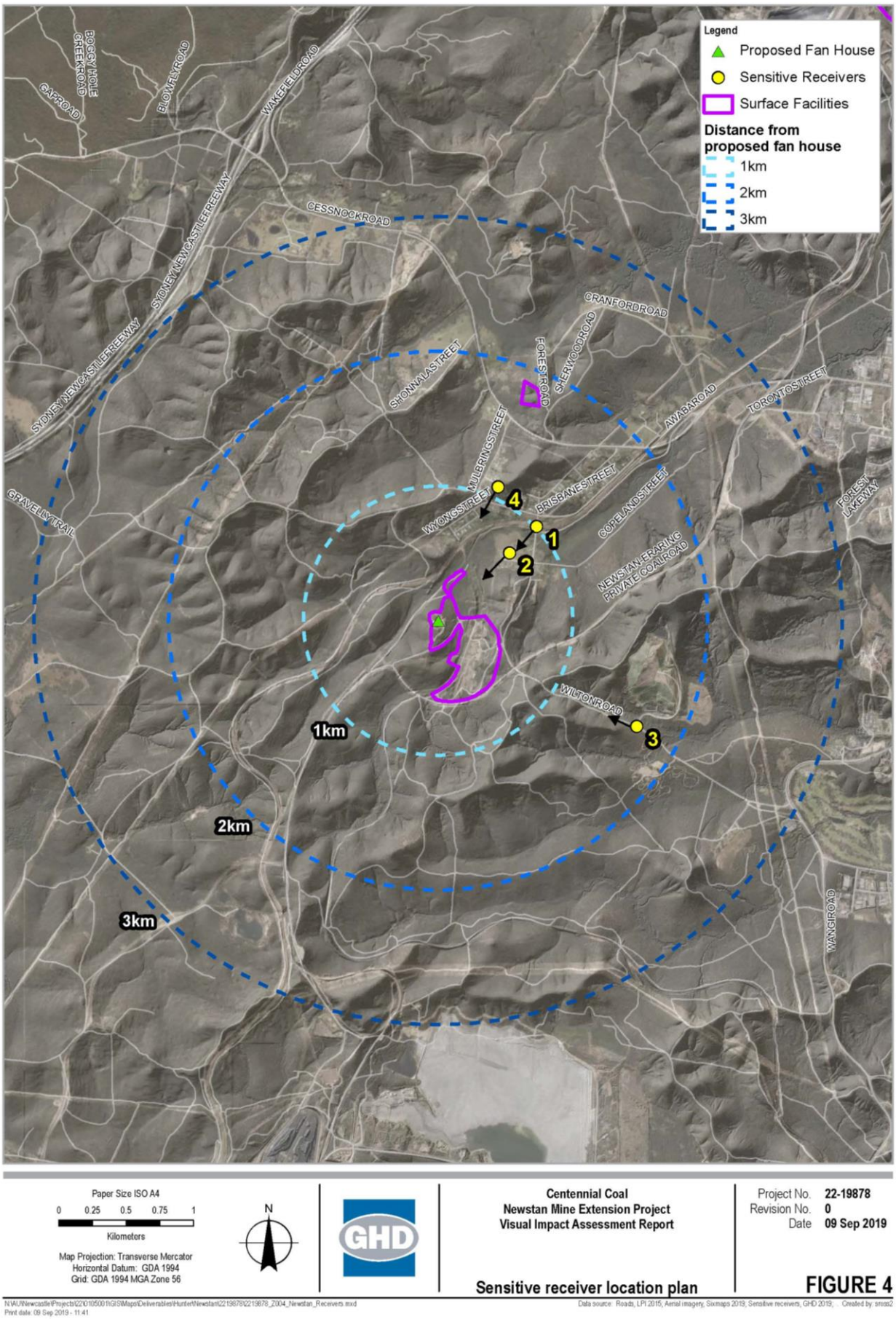


Figure 4-2 Viewpoint location plan

5. Impact assessment

5.1 Visual impact assessment

The following section assesses the visual impact of the project from the viewpoint locations identified in section 4.4.2.

5.1.1 Viewpoint location 1: Awaba Station footbridge

Criteria	Comments
Location and View Direction	**Awaba Station footbridge**. VP1 is located on the pedestrian bridge which connects the two platforms at the train station. It is approximately one kilometre from the project. This view looks north-west and is representative of pedestrians and commuters within the local area.
Description of Existing View	VP1 includes Wilton Road to the left of the view, rising to the treed ridgeline on the horizon. To the middle and the right of view, behind the trees is the Awaba Oval in a low flat area. Low density single story residential dwellings appear to the left, adjacent to Wilton Road. Vertical infrastructure features appearing in the view include light poles, power poles and footbridge railings.
Anticipated Change to View	The anticipated change to VP1 would be **negligible** as it is anticipated that the proposed development would be not be visible, behind the treed ridgeline.
Sensitivity to Change	**Negligible**, as views of the project are screened by the vegetation and topography.
Magnitude of Change	**Negligible**, as it is anticipated there will be no change to this view.
Significance of Impact	**Negligible**

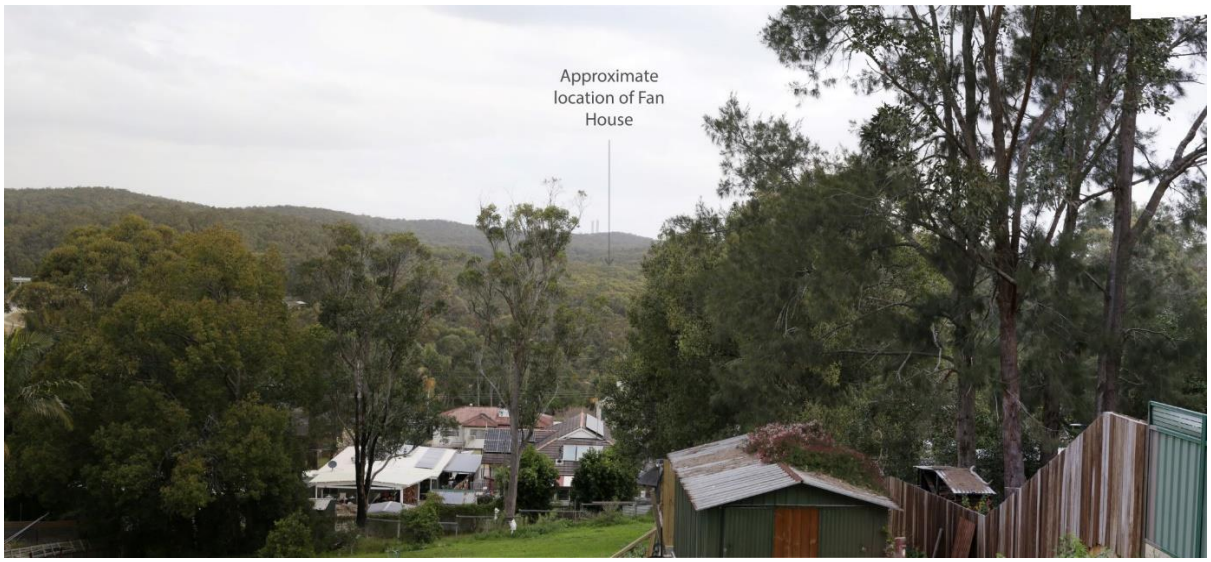
5.1.2 Viewpoint location 2: Awaba Oval

Criteria	Comments
Location and View Direction	**Awaba Oval (Robert "Dutchy" Holland Oval)**. VP2 is located in the Awaba Oval driveway, to the north of Olney Street. It is approximately one kilometre from the project, looking south-east. This view is representative of pedestrians and sports users as well as residents on Olney Street.
Description of Existing View	VP2 comprises of Awaba Oval reserve to the foreground of the view and Olney Street residences on elevated land to the left, with dense forest vegetation behind the residences and reserve. Existing vertical infrastructure elements in the view include overhead power poles, transmission lines and the fencing of the tennis courts to the right of the view.
Anticipated Change to View	The anticipated change to VP2 would be **negligible** as the project would be not be visible behind the vegetated ridgeline.
Sensitivity to Change	**Negligible** Views of the project are screened by the vegetation and topography.
Magnitude of Change	**Negligible** There will be no change to the view.
Significance of Impact	**Negligible**

5.1.3 Viewpoint location 3: Awaba Waste Transfer Depot

Criteria	Comments
Location and View Direction	**Awaba Waste Transfer Depot (and community recycle centre).** VP3 is located on the corner of 367 Wilton Road and the Awaba Landfill and Waste Transfer Depot Entrance. VP3 is approximately one kilometre from the proposed project. This view is representative of users of the Waste Transfer Depot and road users.
Description of Existing View	VP3 shows Wilton Road, looking south, surrounded by road reservation. The dense eucalypt forest on both sides encloses the view.
Anticipated Change to View	The anticipated change to VP3 would be **negligible** as the project would not be visible behind existing vegetation.
Sensitivity to Change	**Negligible** The vegetation screens views of the project.
Magnitude of Change	**Negligible** There will be no change to the view.
Significance of Impact	**Negligible**

5.1.4 Viewpoint location 4: Nellinda Street Water Tower



Criteria	Comments
Location and View Direction	**Nellinda Street Water Tower**. VP4 is located on Nellinda Street adjacent to the water tower. It is representative of the elevated views from residential areas located on the southern crest of the ridgeline, including the northern part of Dora and Adelaide Streets. It is approximately one kilometre from the proposed project. The view looks south from an elevated position.
Description of Existing View	VP4 shows residential properties, mature trees and a vacant lot rolling down the hill to Awaba township in the centre of the view. The middleground to background shows a rolling, hilly landscape with large tracts of native bushland. The centre of the view shows the two chimney stacks of the Eraring Power Station rising high above the horizon.
Anticipated Change to View	Due to the elevation and angle of view, it is possible that a small section of the upper portion of the fan house buildings may be visible in the centre of the view during daylight hours, as it is approximately at the same height as the tree canopy. However it is also possible that the fan house buildings may sit below the tree-lined ridge and therefore will not be visible. Water vapour may occasionally protrude above the fan house buildings to a height of approximately 3m. It would be more visually prominent during cooler months. However, at such distance, it is not expected to be easily visible from this view. It is unlikely that the fan house buildings will be visible during night-time as the upper portions of the fan house buildings will be unlit.
Sensitivity to Change	**Low** Residents have scenic values associated with this view due to the presence of the forested hillsides as a backdrop, however, if the project is visible, it would be minimal, mostly screened by vegetation and viewed from a distance. Also, viewers are likely to experience this view infrequently as entrances and exits to the properties generally face a different direction.
Magnitude of Change	**Low** The anticipated change would be a noticeable but relatively minor new addition to the view, appearing below the dominant escarpment backdrop. The vertical chimney stacks of Eraring Power Station also feature in the middle of the view, in the same direction as the project. These are much more visually dominant as they rise high above the horizon line. The change would not be uncharacteristic within the existing view.
Significance of Impact	**Low**

5.2 Summary of impacts

Table 5-1 provides a summary of visual impacts for the project.

Table 5-1 Summary of visual impacts

VP	Location	Sensitivity to change	Magnitude of change	Overall rating
VP1	Awaba Station	Negligible	Negligible	**Negligible**
VP2	Awaba Oval	Negligible	Negligible	**Negligible**
VP3	Awaba Waste Transfer Depot	Negligible	Negligible	**Negligible**
VP4	Nellinda Street	Low	Low	**Low**

5.2.1 Proposed actions to mitigate impacts

Where practicable, Centennial Newstan will position surface infrastructure in locations where visual screening can be provided by the topography or existing vegetation. Building heights will also be limited to minimise visual environmental impacts.

5.3 General response to key legislation and policy objectives

Table 5-2 provides a summary of the project's response to key landscape and visual legislation and policy objectives relevant to the study area. Whilst responses to the objectives of the Lake Macquarie Local Environmental Plan 2014 and Lake Macquarie Development Control Plan 2014 have been included in the table, it is acknowledged that the project is State significant development (SSD) and as such, the provisions of these environmental planning instruments do not apply pursuant to the State Environmental Planning Policy (State and Regional Development) 2011.

Table 5-2 Policy response summary table

Legislation / Policy	Objectives	Response	Reference
Lake Macquarie Scenic Management Guidelines 2013	*'…Retain existing ridgeline and hillside vegetation which provides a dominant backdrop to views from surrounding key viewpoints'* **From Scenic Management Zone 11: Wakefield Area**	Views from the identified publically accessible viewpoints towards the main ridgeline (north of Awaba township along Nelinda Street), are not impacted.	Section 4.2
	'…building and structure height does not extend above the physical ridgeline, not the tree-line; **From Scenic Management Zone 11: Wakefield Area**	It is unlikely that the project will extend above the physical ridgeline (north of Awaba township along Nelinda Street), when viewed from the identified viewpoints	Section 4.2
	'…opportunities to rehabilitate any degraded areas are identified'. **From Scenic Management Zone 11: Wakefield Area**	Ridgeline vegetation will not be impacted by the project.	Section 4.2

Legislation / Policy	Objectives	Response	Reference
Lake Macquarie Local Environmental Plan 2014	*'…To encourage development that is sympathetic to the scenic, aesthetic and cultural heritage qualities of the built and natural environment'.* **(However this is only applicable in Zone R2 Low Density Residential areas, ie. where the views are taken from)**	This is only applicable to Zone R2 Low Density Residential areas. The project is in zone Special Purpose Zone SP1	Section 4.2
	'…To facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land'.	This project is visually in keeping with the existing built form characteristics of the site.	Land use **SP1 Mining Special Activities Zone**
	'…To encourage development that is sympathetic to the scenic, aesthetic and cultural heritage qualities of the built and natural environment'.	This project is visually in keeping with the existing visual characteristics of the site	Land use **R2 Low Density Residential Zone**
	'…To protect, manage and restore areas of high … aesthetic values …To prevent development that could destroy, damage or otherwise have an adverse effect on those values'.	This project is visually in keeping with the existing built form characteristics of the site	Land use **E2 Environmental Conservation Zone**
Lake Macquarie Development Control Plan 2014	*'…To ensure that the scenic values of the City are protected and enhanced. To ensure that developments visible or adjoining the coastline, Lake Macquarie or ridgelines maintain and enhance the scenic value of these features'.* This document refers to the Scenic Management Guidelines, 2013.	From the identified viewpoints, the scenic values of the ridgeline are not compromised by the project. It is anticipated that the project will not impact the scenic qualities of the ridgeline from any publically assessable viewing locations.	
Newcastle Metropolitan Plan	*'…Lake Macquarie, its waterfront and the coastline will be protected from encroachment of development that impacts open space and diminishes the natural landscape setting'.*	The project does not encroach on open space and does not diminish the natural landscape setting.	Landscape setting
Crown Land Management Act 2016	*'…that the natural resources of Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible'.*	The project does not impact crown land scenic quality.	Scenic qualities

6. Conclusion

This VIA has been undertaken to understand the potential via amenity impacts of the Newstan Mine Extension Project.

Awaba Colliery Surface Site is located in a valley, surrounded by dense vegetation of approximately 20 m height. The existing surface infrastructure is largely shielded by the existing vegetation.

The assessment found that the visual impacts from the project range from **Negligible to Low** significance.

The site inspection revealed the viewshed for the project is primarily confined to the northern part of the Awaba township, on the ridgeline.

Four viewpoint locations were chosen to assess the visual impact of the project on sensitive receivers within the study area. Sensitive visual receivers in the study area include pedestrians using Awaba Station footbridge; residents and pedestrians near Awaba Oval on Olney Street; residential properties around Nellinda Street and Dora Street; and road users on Wilton Street near the Waste Transfer Station.

Three additional sensitive receiver locations were identified and considered to have negligible visual impacts.

Based on the ZTV modelling, desktop analysis and the site visit, it is expected that project will not be visible from publically accessible areas within 900m of the project's tallest element, the fan house buildings, with the exception of at the Awaba Colliery entrance gates, off Wilton Road.

Within one kilometre, the only identified impacts are to VP4 on Nellinda Street on the Awaba township ridgeline. This was due to the residential receiver types, proximity and visual exposure to the proposal.

In addition, there are no formal public lookouts identified within the local landscape surrounding the proposed Awaba Colliery Surface Site.

Given the extent and combination of existing undulating landform character and tree cover surrounding the proposed Awaba Colliery Surface Site, the capability of the landscape to screen views to the key components is considered to be high. The dense forested vegetation of the surrounding landscape is likely to reduce the potential magnitude of visual impact significance.

Due to the elevation and angle of view from the ridgeline along Nellinda Street, there is a small possibility that residents and pedestrians may have glimpsed views to the top of the proposed fan house buildings, viewed within the treetops. However as the highest part of the project is 20m high, located in a valley, surrounded by vegetation (of approximately 20m height) and with a treed ridgeline potentially blocking the view; visibility is unlikely. Water vapour may occasionally protrude above the fan house buildings to a height of approximately 3m. However, at such distance, it is not expected to be easily visible from this view.

7. References

Environment Protection and Biodiversity Conservation Act 1999

Lake Macquarie City Council, *Lake Macquarie Local Environmental Plan 2014*

Lake Macquarie City Council, *Lake Macquarie Scenic Management Guidelines 2013*

Lake Macquarie City Council, Lake Macquarie Development Control Plan 2014 – Revision 21

Landscape Institute and Institute of Environmental Management & Assessment, UK (2013), *Guidelines for Landscape and Visual Impact Assessment, Third Edition.*

Mining Act 1992

NSW Government Planning and Environment (2015) *Hunter regional plan 2036, 2016*

NSW Government Planning and Environment (2015) *Integrated landscapes for coal mine rehabilitation in the Hunter Valley (1999)*

Protection of the Environment Operations Act 1997

Roads and Maritime Services, Australia (2018), *Environmental Impact Assessment Practice Note EIA-N04 - Guideline for Landscape Character and Visual Impact Assessment, Version 2.1*

8. Limitations

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https://projects.ghd.com/oc/Newcastle3/newstanextensioneis/Delivery/Documents/VO-01 Visual Impact Assessment/222026105_REP_Newstan_Mine_Extension_Project_EIS_VIA.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
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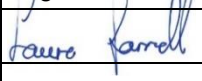
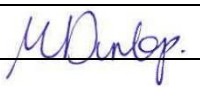
0	S. Rae	L.Farrell		M. Dunlop		28/10/2019

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