

PROPOSED REZONING

HYDRO ALUMINIUM, KURRI KURRI



VISUAL IMPACT ASSESSMENT

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ENVISAGE DOCUMENT NO.: E57/14 VIA/Rev 01

DOCUMENT CONTROL

REVISION	Date of Issue	Revision details	Approved By
00	15 Dec 2014	Draft for comment	SB
01	20 March 2015	Final	SB



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Executive Summary

Hydro Aluminium proposes to rezone their former aluminium production site and surrounding lands (the Site) at Kurri Kurri. This report presents an assessment of the likely visual effects that would result from the proposed rezoning (from the current largely rural zone, to proposed employment, residential, conservation and rural zones). The report has been prepared for ESS Australia (on behalf of Hydro Aluminium) to inform the planning proposal to be submitted to Cessnock and Maitland Councils for the rezoning.

The visual effects of the proposal have been addressed in terms of the effects on the landscape (how the existing character of the Site would change), and the effects on views and visual amenity (considered from the viewpoint of residents living near the proposal, tourists and commuters travelling in the vicinity, and communities in the surrounding area).

The Proposal

Hydro Aluminium has prepared a rezoning plan for the Site shown at Figure 1-1 (the Proposal). The Proposal indicates rezoning for residential and employment lands, as well as significant areas for conservation. The proposed rezoning includes:

- Environmental Conservation (1349ha)
- Residential (182.2 ha)
- General Industrial (125.5 ha)
- Business (38.18 ha) and
- Heavy Industrial (34.38 ha).

Major visual changes and recommendations

Overall the visual changes that would result from the Proposal should be generally positive, assuming the proposed design measures recommended in this report are incorporated.

Rezoning the Site implies removal of the existing plant (the tall stacks and the contiguous mass of industrial buildings that form the plant) to allow for the activities associated with the proposed new zones. The Hydro Aluminium facility's stacks have been a dominant and recognisable industrial element on the local skyline for many years. The removal of the stacks is the most significant visual change likely to affect the largest number of people in the vicinity.

The existing plant buildings can be seen from select residential properties north of the Site (Kiah Road, Hungerford Lane, Gillieston Heights), and east of the Site (Bowditch Avenue). The proposal to rezone the plant area to 'General Industrial' would reduce the height and mass of built form currently seen from these locations, and with the inclusion of mitigating design measures (such as a continuous canopy of trees and screen planting), views into the proposed industrial zone could potentially be largely screened in the longer term.

A Heavy Industrial zone is proposed adjacent to the General Industrial zone within an existing forest/bushland area. The proposed zone would result in a large area of vegetation being cleared and an increase in the total area of buildings, roads and

infrastructure on the Site. It is possible that the proposed Heavy Industrial zone could be viewed from some properties located north of the Site (Kiah Road and Hungerford Road, and possibly select streets within Gillieston Heights). Extensive planting and careful placement of buildings throughout the proposed Heavy Industrial zone (as outlined in the mitigating design measures) would be essential to minimise its potential visibility.

A Business zone is proposed along Hart Road, Weston. Users of Hart Road (including those accessing the Hunter Expressway) would experience significant visual change. Their views, although transient as they travel through the area, would be affected by the loss of vegetation lining the road and the introduction of buildings and commercial enterprises. Mitigation measures have been recommended to promote an attractive new development and minimise negative visual effects. The changes along Hart Road are limited from permanent viewing locations, such as residential properties and existing businesses in the area.

The visual exposure of the proposed residential areas (R2 zones) within the Site is generally limited due to their lower elevation and surrounding landform. An exception is the proposed R2 zone located on the highest section of the Site adjoining Main Road. The view from Main Road and existing residential areas of the proposed R2 zone would be consistent with the views of surrounding residential development occurring along that road and within adjacent suburbs. For most future residents of the proposed R2 zones, the elevated South Maitland Railway line, landform and proposed mitigating measures, would provide a visual impediment restricting views between the proposed residential areas and proposed industrial areas of the Site.

A significant proportion of the Site is proposed to be zoned Environmental Conservation. This zone would maintain large areas of vegetation within the Site, provide green buffers between more intensively developed zones, help screen views into the proposed zones, and make the Site as a whole more attractive.

Under the Proposal, the existing plant and stacks would make way for the proposed commercial and industrial zones, which could be developed as attractive business and employment areas with the introduction of mitigating design measures. The proposed residential areas, although increasing the extent of residential visual character in the vicinity, are close to the existing and planned residential developments (consolidating between Kurri Kurri and Maitland), and it is likely that there is a strong awareness and expectation of such change due to the rapid pace of residential development in the surrounding area.

Although there would be substantial long-term visual change with the transformation of the existing rural zoned Site to a more extensive commercial, industrial and residential setting, the proposal is likely to improve views from many vantage points. There are opportunities to ensure attractive communities can be achieved by implementing appropriate design principles and other mitigation measures such as those recommended in this report.

1.0 Introduction

1.1 Purpose of this report

The purpose of this report is to address the potential visual amenity effects associated with the proposed rezoning of the former Hydro Aluminium production site at Kurri Kurri in the Hunter Valley, NSW. Hydro Aluminium has prepared a masterplan to rezone the Site (November 2014). This assessment considers the potential changes to the landscape and the effect on views that would occur as a result of the masterplan.

The report has been prepared for ESS Australia (on behalf of Hydro Aluminium) and will form part of a planning proposal to rezone the land from the current zone, being largely rural, to proposed employment, residential, conservation and rural zones.

1.2 Background

Hydro Aluminium formerly operated an aluminium production facility on land north of the town of Kurri Kurri in the Lower Hunter Valley. The 2,000-hectare landholding (the Site) is still owned by Hydro Aluminium.

The aluminium operations area comprises approximately 60 hectares of the 2,000-hectare Site. In addition to the former aluminium production facilities, the Site includes large areas of native forest, pastoral land, open floodplain, some rural dwellings, and a public speedway.

Hydro Aluminium ceased production at the Site in 2012 and has since confirmed the permanent cessation of operations. A strategic review of operations, infrastructure and landholdings has commenced to establish a future vision for the Site.

1.3 The Proposal

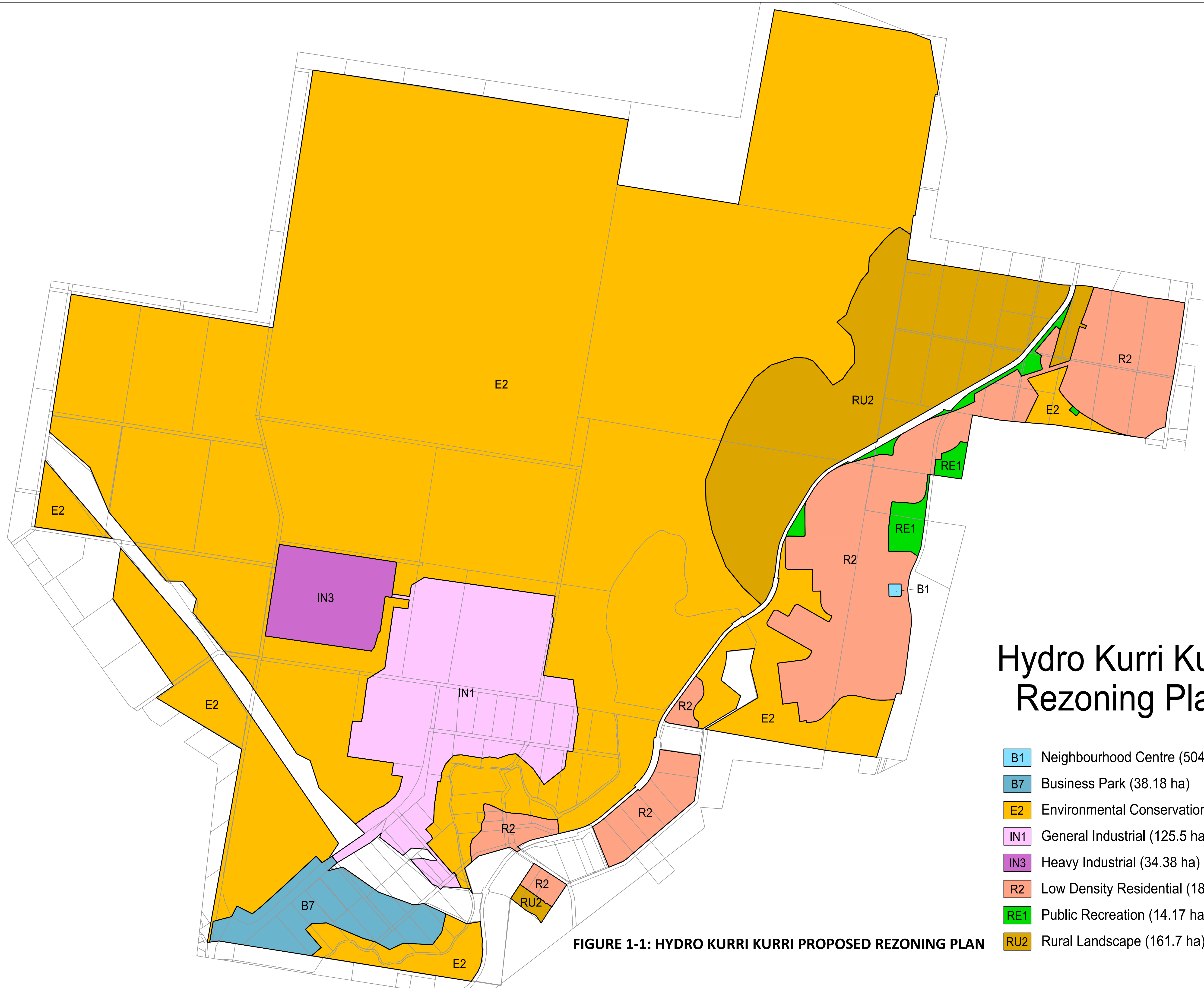
Hydro Aluminium has prepared a rezoning plan for the Site shown at Figure 1-1 (the Proposal). The Proposal indicates rezoning for residential and employment lands, as well as significant areas for conservation. The proposed rezoning includes:

- Environmental Conservation (1349ha)
- Residential (182.2 ha)
- General Industrial (125.5 ha)
- Business (38.18 ha) and
- Heavy Industrial (34.38 ha).

1.4 Planning Context

Hydro Aluminium is preparing their rezoning application under Part 3 of the *NSW Environmental Planning and Assessment Act* (EP&A Act), as the Proposal relates to the preparation or modification of an environmental planning instrument.

The bulk of the Site lies within Cessnock local government area. A small area of the northern extent of the Site lies within Maitland local government area. The proposed rezoning, therefore, applies to the *Cessnock Local Environmental Plan 2011*, and *Maitland Local Environmental Plan 2011*.



Hydro Kurri Kurri Rezoning Plan

- B1 Neighbourhood Centre (5046m²)
- B7 Business Park (38.18 ha)
- E2 Environmental Conservation (1349 ha)
- IN1 General Industrial (125.5 ha)
- IN3 Heavy Industrial (34.38 ha)
- R2 Low Density Residential (182.2 ha)
- RE1 Public Recreation (14.17 ha)
- RU2 Rural Landscape (161.7 ha)

FIGURE 1-1: HYDRO KURRI KURRI PROPOSED REZONING PLAN

Cessnock Council has requested that a visual impact assessment of the Proposal be prepared and submitted with the application for rezoning.

1.5 Methodology

The methodology used to prepare this report is based on professionally accepted processes for assessing the landscape and visual effects of developments and their significance, and is adapted from those provided in the following well-regarded documents:

- Guidelines by the NSW Roads and Maritime Services *Environmental Impact Assessment Guidance Note: Guidelines for landscape character and visual impact assessment*; and
- Guidelines by the United Kingdom's Landscape Institute and Institute of Environmental Management and Assessment *Guidelines for Landscape and Visual Impact Assessment*, 3rd edition.

Mitigation measures included in this report have been developed from professional experience and reference to relevant documents that include Cessnock and Maitland Council planning documents, the *Lake Macquarie Scenic Management Guidelines* (Lake Macquarie City Council, 2013) and *Visual Landscape Planning in Western Australia* (Western Australian Planning Commission, 2007). It is to be noted that there are no specific guidelines or legislation that apply to visual impact assessments in NSW.

The principal tasks of the visual impact assessment process are:

Task 1: Establishing baseline landscape and visual conditions

Task 2: Identifying the landscape and visual effects of the proposed development

Task 3: Determining the significance of the effects

Task 4: Developing mitigation measures.

The approach for these principal tasks has been tailored to ensure it is appropriate to the particular circumstances of this Proposal.

1.6 Structure of report

This report presents the findings of the above tasks and is structured in the following way:

Section 1.0	This section - an introduction to the report and overview of the Proposal
Section 2.0	A description of the existing landscape character at the Site and who can see the Site (task 1)
Section 3.0	A description of the proposal and its likely visual character
Section 4.0	Description of the effects on landscape character - visual changes that would occur (task 2 and task 3)
Section 5.0	Description of the effects on views and visual amenity (task 2 and task 3)
Section 6.0	Mitigation measures to address landscape and visual amenity issues are identified (task 4)
Section 7.0	Conclusions.

2.0 Existing Character

This section provides a description of the existing Site – its character, land uses and surroundings - in order to provide an understanding of the landscape that may be affected by the Proposal.

The visibility of the Site, that is, who can see the existing Site and what they can see, is also explored, and locations from which the Site is seen are identified.

2.1 Site location and context

A visual context plan of the Site is shown at Figure 2-1. The 2000-hectare Site is approximately three kilometres northwest of the town centre of Kurri Kurri.

The northern portion of the Site lies within the lower Hunter River floodplain (within the 1:100 flood zone), and is used mostly for cattle grazing. Higher up the slopes from the floodplain, the density of vegetation increases. On an elevated area of the Site is the former Hydro Aluminium production facility.

The Site production facilities were historically accessed from Hart Road, via Weston. The Site is now accessed from the Hunter Expressway (opened March 2014) via the Hart Road off-ramp. There is a second point of access into the eastern, rural sections of the Site from Main Road. The Hunter Expressway traverses the southwest of the Site, and separates a portion of the Site (on the southern side of the Hunter Expressway) from the bulk of the Site (north of the Hunter Expressway).

The vicinity of the Site is generally rural, however, there are several existing residential communities in the area, and an expanding residential development area to the east. The closest residential communities are Heddon Greta and Clifftleigh to the southeast, and Gillieston Heights to the northeast (which are all accessed from Main Road), and Weston on the southern side of the Hunter Expressway.

The South Maitland Railway line passes through the southeastern portion of the Site from the community of Weston to the residential area of Gillieston Heights. The railway line services Austar Colliery and is still operational, although very few trains use the line (it is estimated that use is one train per day at maximum). The railway separates a portion of the Site (located east of the line) from the bulk of the Site (west of the line).

Within the immediate surrounding area are rural enterprises, such as poultry farms, cattle yards, equine-related businesses and other small rural holdings. Surrounding major facilities include Kurri Kurri Technical and Further Education (TAFE) on the southeast boundary of the Site, and Weston Aluminium and Kurri Kurri Sewage Works to the Site's south (south of the Hunter Expressway).

2.2 Landscape character

The Site has been divided into different landscape character areas (shown on Figure 2-2) to describe different aspects of the Site as follows:

- Rural floodplain
- Pastoral slopes
- Shrubby bushland
- Forest



FIGURE 2-1: VISUAL CONTEXT

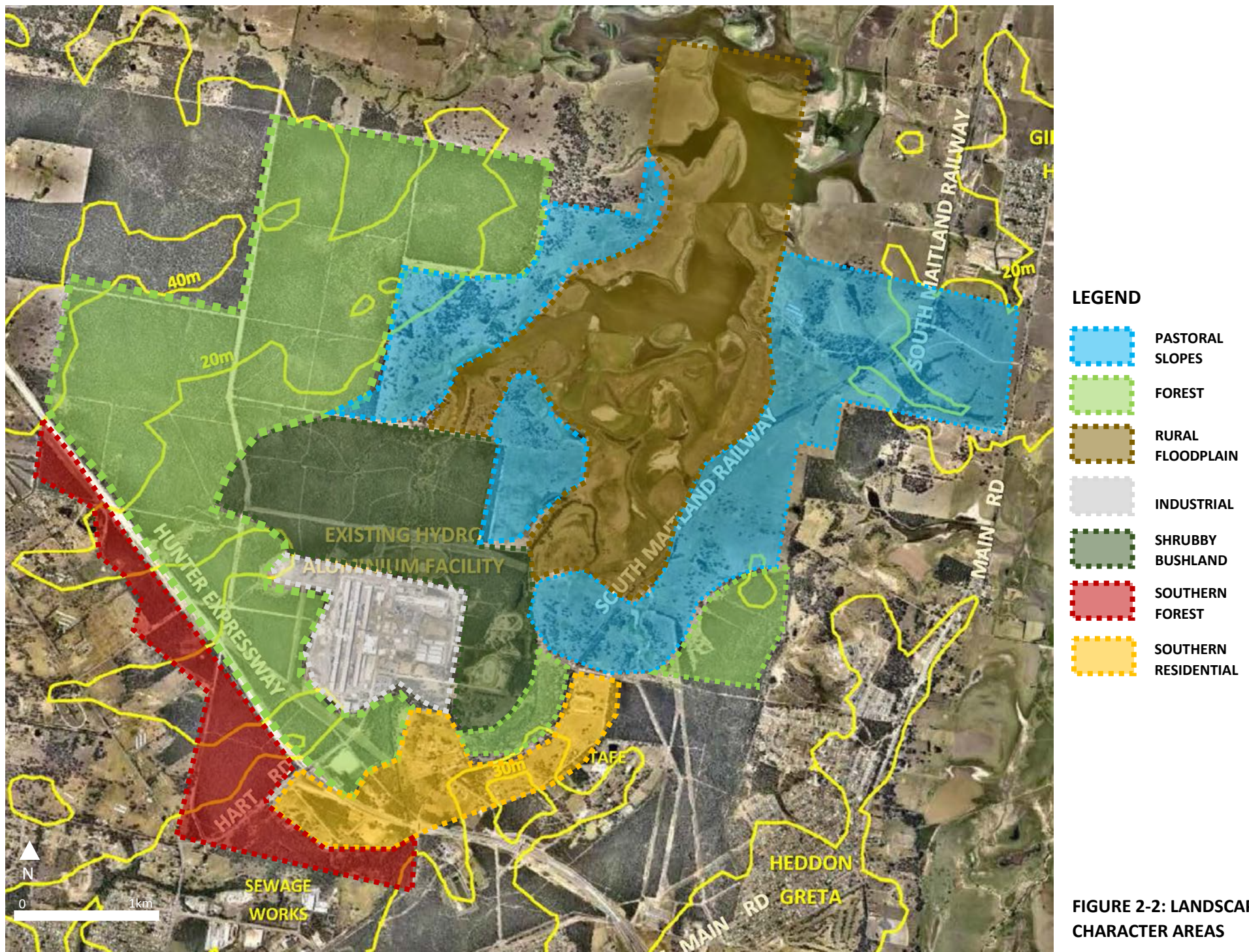


FIGURE 2-2: LANDSCAPE CHARACTER AREAS

- Industrial
- Southern residential
- Southern forest.

These landscape character areas are broadly homogenous areas that inhabit similar landscape characters based on common characteristics such as landform, vegetation cover, land use and location. These areas generally reflect visual characteristics, and as such may not be consistent with ecological characteristics and vegetation mapping of the Site.

Rural floodplain



Figure 2-3: View of the rural floodplain within the Site

The northern and central areas of the Site lie within the lower Hunter River floodplain. The floodplain is generally cleared of trees, covered by pastoral grasses, and used for cattle grazing. The floodplain, being broad, low in elevation, and generally clear of tall vegetation, permits extensive views to the surroundings north and east of the Site. Figure 2-3 is a typical image of this landscape character area.

Pastoral slopes



Figure 2-4 View of pastoral slopes

As the slopes rise from the floodplain, the density and height of vegetation increases. This area is used for cattle grazing and pasture grasses dominate with tall native trees. Figure 2-4 is a typical image. This area extends east of the railway line and includes a poultry enterprise located within the Site.

Shrubby bushland



Figure 2-5 View of shrubby bushland

In the upper reaches of the floodplain, deeper into the Site, elevation remains low and the land is sandy. These lower slopes wrap around the north and east of the industrial facilities. Tall native shrubs and small native trees cover the area and there are numerous water bodies (ranging from small drainage lines to creeks).

Figure 2-5 is a typical image.

The height of the vegetation in this area is generally lower than the height of the trees in the adjoining pastoral slopes and forest.

Forest



Figure 2-6 View of forest and transmission line clearing

The forested areas are located on the higher slopes and plateaus of the Site. The forest character is of dense vegetation comprising taller native trees on drier soils. Several

wide, cleared corridors are maintained within the forest for electricity transmission infrastructure, and internal access roads. Figure 2-6 is a typical image.

The forest provides an important buffer west of the former production facilities along the Hunter Expressway contributing to the extent of green canopy of the Lower Hunter valley. The green canopy the forest provides is visible from higher elevated areas surrounding the Site. Parcels of native forest also occur within the Site north of Heddon Greta, and east of the railway line around McLeod Road/Bowditch Avenue residential area.

Industrial



Figure 2-7 View of entry to the former production facilities

The disused aluminium production facilities are located on an elevated area of the Site near the Hunter Expressway access. The existing industrial plant includes numerous tall stacks, storage sheds, roads, fencing and offices. The plant entry on Hart Road is shown Figure 2-7.

Although surrounded by native vegetation, the plant, and the stacks in particular, are exposed to a wide viewing area due to the elevated location and being comprised of tall structures substantially higher than the surrounding trees.



Figure 2-8 View of plant from Kurri Kurri Speedway

East of the production facilities, within the Site, are two public recreation facilities: Kurri Kurri Speedway and Kurri Kurri Junior Motorcycle Club. These facilities are lower in elevation than the production facilities. In addition to the speedway track, infrastructure includes sheds and lighting. The view of the plant from Kurri Speedway is shown in Figure 2-8.

West of the production facilities is a cleared area surrounded by forest. The cleared area had been used during the Site operations for storage and is included in this character area.

Southern residential



Figure 2-9 View of a southern residential property

The southern residential character applies to three small residential areas occurring generally to the south of the Site. The largest of these is at Loxford (including the residential properties along McLeod Road, Dawes Avenue and Bowditch Avenue). These residential properties are rural, comprising houses set in pastoral, open grassed areas, some with stock, stock fences, stands of tall trees and sheds. A typical view of the rural residential character is shown at Figure 2-9.

The South Maitland Railway passes through Loxford and is visible from some locations along McLeod Road. A large area of forest flanks some sections of the railway line as well as the northern side of McLeod Road.

Many of the rural residential properties of Loxford are within the Site boundaries.

The two smaller southern residential character areas are located near the Hart Road/Hunter Expressway on/off ramp. These areas lie fully within the Hydro property. The residential area near the Expressway on-ramp is centred along Scales Avenue. The residential area near the Expressway off-ramp is centred along McGarva Avenue and Horton Road.

Southern forest

South of the Hunter Expressway, toward the community of Weston, is the smaller, southern portion of the Hydro Aluminium Site, accessed by the western end of Hart Road. This area is primarily forested with pockets of rural residential. Dense native

vegetation lines Hart Road. A typical view from Hart Road looking westward toward Weston is shown Figure 2-10.

A creek line traverses this portion of the Site to the south. South of the creek, along Mitchell Avenue, is an industrial hub.



Figure 2-10 Southwestern view of Hart Road

2.3 Observer Locations

The existing Hydro Aluminium Site is visible from the surrounding area – from roads, urban areas, and private properties. Different groups experience different views of the Site from different places.

The following key locations from which the Site can be seen have been identified:

1. Kurri Kurri town centre
2. Weston
3. Loxford
4. Heddon Greta/Cliftleigh
5. Gillieston Heights
6. Main Road
7. Kiah Road/Hungerford Lane (west Gillieston Heights)
8. Bishops Bridge/Farley
9. Hunter Expressway.

These locations are identified on Figure 2-11. The observation points are not exhaustive, yet have been identified as the most important viewpoints that should be assessed in terms of the proposed future development due to their location, visibility and type and are the primary, publicly accessible locations from which the Site can be seen.

Viewpoints from properties wholly within the Site boundaries (such as rural properties near the Hart Road/Hunter Expressway on/off ramp and the Kurri Kurri Speedway) have not been considered in this assessment. In addition, although the South Maitland Railway runs through the Site, trains are very infrequent and there is no passenger service on the line. Therefore, views from the railway line have not been considered in this assessment.

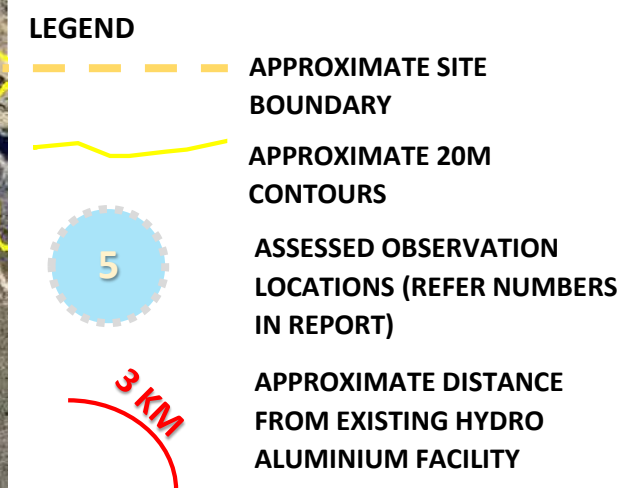


FIGURE 2-11: ASSESSED OBSERVATION LOCATIONS

The key observer locations, and what can be seen of the Site from those locations, are discussed below.

1. Kurri Kurri town centre

Kurri Kurri town centre caters for workers, residents, and visitors; and provides social, educational and recreational activities. Some elevated locations within Kurri Kurri offer views toward the Site. The view is primarily of an extensive tree canopy with a backdrop of ridgelines. Vegetation, buildings and landform screen the bulk of the facility.

However, from select locations the tall stacks of the Hydro industrial facility are visible. The distinctive stacks and rooftops of some of the higher Site buildings can be seen from some locations within Kurri Kurri. Also within view from these locations, are other tall, industrial elements (such as transmission poles) not associated with the Hydro Site. A typical view from Kurri Kurri urban area showing the Site stacks is shown in Figure 2-12.



Figure 2-12 View toward the Site from Kurri Kurri town centre

Kurri Kurri has two three-storey buildings (Regal and Chelmsford Hotels). The top floors of these two buildings are visible from some locations within the Site. It is likely that from the top floor of these buildings, more extensive views of the industrial facility infrastructure may be possible. However, the top floors are not open to the public, so few people would have an opportunity to access such a view. The view toward Kurri Kurri from the Site at Hart Road is shown in Figure 2-13.



Figure 2-13 View from Hart Road (north of Hunter Expressway) toward Kurri Kurri

2. Weston

Hart Road and Government Road provide opportunities to view the southern portion of the Site near Weston. These roads are busy with residents, school buses, trucks, commuters and business traffic. With the exception of these roads, however, travellers have limited opportunity to view further into the Site due to the density of vegetation lining the roads.



Figure 2-14 View north toward Hart Road from Gingers Lane/Government Road intersection

A view of the southern portion of the Site from Government Road, Weston, is shown Figure 2-14.

Views of the Site stacks located on the northern portion of the Site are possible from select areas within Weston, such as when travelling along Government Road and Hart Road. The Site stacks are a distinctive feature above the tree canopy as drivers approach the Hunter Expressway/Hart Road on-ramp from Weston.

Mitchell Avenue, Weston, is home to industrial and commercial businesses, including Weston Aluminium. Views of the southern portion of the Site from Mitchell Avenue are blocked by dense vegetation. A view of Mitchell Avenue showing warehousing on the eastern side of road and vegetation on the western side of the road is shown Figure 2-15.



Figure 2-15 View of Mitchell Avenue, Weston, from Government Road

Near the industrial hub along Mitchell Avenue, the Site stacks are visible above the tree line.

3. Loxford

The Loxford residential area (McLeod Road, Bowditch Avenue and Dawes Avenue) is partially located within the Site boundaries. Several of Loxford's residential properties therefore, are part of the Hydro property. However, Loxford also includes the closest privately owned residential properties to the former Site production facilities.

The rural properties of Loxford are accessed from McLeod Road overpass, which connects the southern side of the Hunter Expressway to the TAFE and residential area north of the Hunter Expressway. From the overpass, the Site stacks can be seen above the tree canopy.

McLeod Road residents generally have a rural outlook or view areas of dense native bushland/forest. From some properties, however, the South Maitland Railway is visible, as well as views of the stacks above the trees. A view toward the Site from McLeod Road is shown Figure 2-16.



Figure 2-16 View from McLeod Road toward the Site

The Site production facilities are seen from some Bowditch Avenue properties, as shown in Figure 2-17.



Figure 2-17 View toward the Site from an elevated Bowditch Avenue property

Views from the TAFE campus of the Site production facilities are prevented by the elevated landform of Bowditch Avenue and vegetation lining the road. Although the production facilities are not visible, limited views of the Hydro-owned rural properties lining Bowditch Avenue are possible from the agricultural areas of the campus.

4. Heddon Greta/Cliftleigh

East of the Site are the communities of Heddon Greta and Cliftleigh. These residential areas have been experiencing extensive residential development, which has occurred both sides of Main Road, and further residential development in the vicinity is taking place.

Views from Heddon Greta and from Cliftleigh toward the Site are generally prevented by landform and tall vegetation.

5. Gillieston Heights

Gillieston Heights is also east of the Site. It is more elevated than Heddon Greta and Cliftleigh, and from some streets, a southwest view toward the Site of the plant infrastructure is possible. From these locations, the stacks and the mass of Site buildings can be seen above the tree canopy. A view from Cartwright Street, Gillieston Heights (near the sports field) is shown Figure 2-18.



Figure 2-18 View toward Site from Cartwright Street, Gillieston Heights

6. Main Road

Main Road is a heavily used route and an important link road to, and from, Kurri Kurri and Maitland. From Main Road, a view of the adjacent elevated pastoral area of the Site is possible. Landform prevents more distant views into the Site. The rural view of the Site's pastoral area is one of the few remaining rural outlooks along this stretch of road that is rapidly changing from rural to residential. A typical view of the Site from Main Road is shown Figure 2-19.



Figure 2-19 View of Pastoral Area of the Site from Main Road

7. Kiah Road/Hungerford Lane (west Gillieston Heights)

The rural residential properties of Kiah Road and Hungerford Lane are located west of the South Maitland Railway line at Gillieston Heights, and north of the Site. These properties are on elevated land rising from the northern fringe of the floodplain.

The view from these properties south across the flat, open floodplain shows the pastoral/rural areas of the Site, and the existing Hydro Aluminium plant infrastructure on the upper slopes surrounded by forest (to its east and west). Although there is vegetation in front (north) of the industrial plant, this vegetation is on a lower elevation and is not as tall as the forest in the background. Hence Site infrastructure can be seen above the lower canopy.

The view of the existing industrial area of the Site is quite extensive for Kiah Road/Hungerford Lane residents. A view toward the Site is shown Figure 2-20.



Figure 2-20 View of the Site from Kiah Road

8. Bishops Bridge/Farley

Bishops Bridge and Farley are rural-residential areas located predominantly along Old Maitland Road and Wollombi Road, extending into the floodplain along a number of roads northwest of the Site, including Ravensfield Lane, Owl Pen Lane and Quarry Road. The houses on these three roads occupy the more elevated parts of the fringing

floodplain, and there are some opportunities from these properties for views of the existing stacks, albeit from five kilometres or more away.

Where views of the former Hydro Aluminium facility are possible, Site infrastructure occupies a small element in the view. The view is dominated by a foreground of the flat, open floodplain and pastoral/rural areas (including those on the Site); and forested areas around and behind the Site infrastructure. A view toward the Site from Owl Pen Lane is shown Figure 2-21.



Figure 2-21 View Toward the Site from Owl Pen Lane, Bishops Bridge

From Bishops Bridge and Farley, views of surrounding residential areas that are elevated above the floodplain are also visible, meaning that the rural views from Bishops Bridge and Farley properties are already affected by urban development.

9. Hunter Expressway

From the Hunter Expressway, noise walls, vegetation, embankments and landform generally block views toward the Site. The exception is from the Expressway's on- and off-ramps and overpasses, and when travelling east along the Expressway in close proximity to the Site. From these vantage points, brief glimpses toward the Site are possible. These views are of vegetated areas. The stacks of the plant can be seen above the tree canopy at these locations. Electricity infrastructure (poles, wires and towers) tends to dominate these views.

3.0 The Proposal

This section provides a description of the Proposal. It indicates the likely visual character and aspects of the Proposal that could potentially give rise to effects on the landscape and visual amenity.

Figure 3-1 Hydro Kurri Kurri Masterplan, the Hydro Kurri Kurri Masterplan, shows the layout and components of the proposed rezoning. Height limits and future character of the proposed zones have not yet been determined. Therefore, to understand what visual changes are proposed and to conduct the assessment, assumptions regarding a 'typical' character for each zone have been made. The assumptions have been based on *Cessnock Council LEP 2011*, *Cessnock Development Control Plan (DCP) 2010*, and *Maitland DCP 2011 (Part F – Urban Release Areas)*, and are outlined below.

3.1 Environmental Conservation (E2)

The largest proportion of the Site (1349 hectares) is proposed to be zoned Environmental Conservation (E2). The objectives of the zone under the LEP are:

- To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.
- To prevent development that could destroy, damage or otherwise have an adverse effect on those values.

Buildings such as dwelling houses and activities such as agriculture are permitted with consent in this zone. However, more intensive built structures, such as motels, business premises and industry are not permitted.

The areas of the Site proposed to be rezoned E2 would likely be subject to an 'improve or maintain' management regime. The landscape character of these areas would therefore likely remain as areas of dense native forest and cleared pastures, and that dwelling houses would not be located within this zone.

3.2 Low Density Residential (R2)

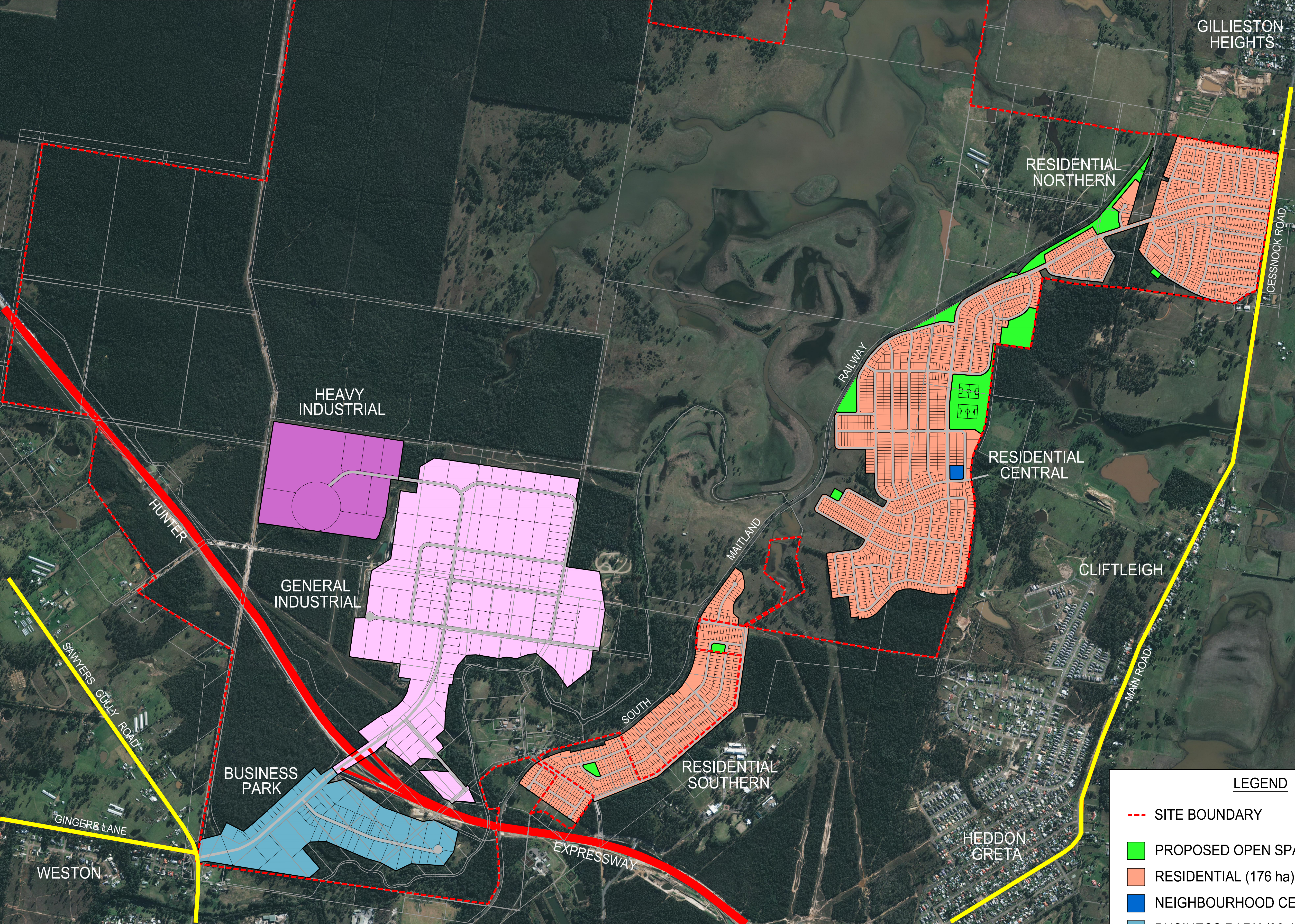
The R2 zone is intended to provide for the housing needs of the community within a low-density residential environment. It does not permit tall, intensive building structures, such as multi-dwelling housing, residential flat buildings or shop top housing.

Cessnock DCP 2010 provides prescriptive measures for R2 subdivision, including: lot shape and size; accessway design; local street design; pedestrians and cyclists; solar access; and lot orientation. Lot sizes and dimensions are to enable dwelling-houses to be sited to:

- protect natural and cultural features;
- acknowledge Site constraints including soil erosion and bushfire risk; and
- retain special features such as trees and views.

Under Cessnock DCP 'Vegetation which adds significantly to the visual amenity or which is environmentally significant or of habitat value shall be conserved in the design of the subdivision proposal'.

HYDRO KURRI KURRI MASTERPLAN



LEGEND

- SITE BOUNDARY
- PROPOSED OPEN SPACES (14.17ha)
- RESIDENTIAL (176 ha)
- NEIGHBOURHOOD CENTRE (5046m²)
- BUSINESS PARK (38.18 ha)
- GENERAL INDUSTRIAL (125.5 ha)
- HEAVY INDUSTRIAL (34.38 ha)

FIGURE 3-1: HYDRO KURRI KURRI PROPOSED MASTERPLAN

Just over 182 hectares of the Site is proposed to be rezoned R2. The R2 zoned areas would be located along the eastern area of the Site (in close proximity to the South Maitland Railway line), and would be accessed from either Main Road/Cessnock Road or McLeod Road.

Maitland DCP may apply to the residential area proposed along Main Road. This DCP has visual and scenic amenity objectives for Main Road urban release areas: 'To protect the scenic values of the landscape and environment, particularly by providing for attractive entrances to the City of Maitland, and encouraging development to be unobtrusive and sympathetic to the surrounding rural setting.

The following design criteria is provided to support the objective:

- Where practicable, existing vegetation is to be maintained and enhanced (particularly along ridgelines, knolls and the slopes), so as to provide buffers and landscaped visual relief within subdivisions and housing development.
- Where available, subdivision and housing design should take advantage of significant and attractive views overlooking surrounding rural lands by orienting streets and locating public space to capture views.
- Development adjacent to rural land and flood prone land are to be suitably designed so as to be compatible with the existing rural character and setting.
- New landscaping shall be provided in visually prominent locations throughout subdivisions, particularly adjacent to any classified roads, including road reserves where practicable, to provide visual relief to the built elements.

For this assessment, it has been assumed that the areas of the Site to be rezoned R2, would have a similar character to the newly developed residential areas along Main Road/Cessnock, adjacent to the Site. That is, the area would generally be cleared of vegetation with the exception of particular trees which may have amenity or habitat value, and the street network, housing layout and style of housing of the proposed R2 zone, would generally be consistent with the surrounding, recently constructed, low-density residential suburbs.

3.3 Rural Landscape (RU2)

Over 161 hectares of the Site is proposed to be maintained as rural land and would be zoned RU2 – rural landscape. A large area of the proposed RU2 zone occurs west of the South Maitland Railway line. Two smaller proposed RU2 areas occur adjacent to the proposed R2 zone.

One of the objectives of the RU2 zone is to maintain the rural landscape character of the land. The zone is intended for extensive agriculture and horticulture, with dwelling houses and other buildings permitted with consent.

Cessnock DCP 2010 provides prescriptive measures for RU2 subdivision. Lot sizes are to be suitable to retain features such as trees and views. Vegetation which adds to the visual amenity of the locality, and / or which is environmentally significant, is to be preserved in the design of the subdivision proposal. Buffers are to be provided to existing development on adjoining agricultural properties.

Specifically, under Element 11: Visual Amenity:

- a) Subdivision proposals shall be designed so that subsequent development will have minimal impact on significant views and vistas.
- b) Subdivisions shall be designed to complement the landscape rather than altering the landscape to suit a subdivision layout.
- c) A subdivision proposal shall be compatible with the cultural and landscape characteristics of the locality or region.

It has been assumed then that the RU2 zone would generally be pastoral in character; that houses would be sited within larger lots accommodating existing natural features; and that existing areas of taller vegetation would be retained. The RU2 zone would have a similar landscape character to the existing rural floodplains on the Site and surrounding areas.

3.4 General Industrial (IN1)

The proposed IN1 zone (at 125.5 hectares) is intended to provide a wide range of industrial and warehouse land uses. Under this zone, light industry such as freight transport, timber yards, and warehouse distribution centres are permitted with consent. The zone prohibits rural industry and commercial premises, as well as more intensive activities such as airstrips, hazardous or offensive storage, and extractive industry.

Cessnock DCP 2010 does not provide prescriptive measures for visual amenity within the IN1 zone, however, it does state that industrial land uses should be compatible with adjacent commercial and/or residential areas, and that the applicant may be required to show the location of landscaping, building and other Site planning techniques with the aim of minimising impact on adjoining commercial and or residential uses.

In addition, Cessnock DCP 2010 specifies environmental management criteria, urban design objectives and development control measures for the development of industrial/commercial employment areas that could be applied to the proposed IN1 zone.

These environmental management measures seek to:

- Ensure a high level of environmental protection by incorporating measures into development to ameliorate any impacts from noise, air and water pollution, dust, lighting, traffic, etc onto surrounding communities.
- Encourage innovative development that integrates well with the built form, landscaped areas and bushland setting to enhance the character of the employment area.

The relevant urban design objectives include:

- To promote integrated and visually attractive buildings within the landscaped and bushland setting.
- To provide an open streetscape with substantial areas for landscaping and screen planting.
- To enhance streetscapes and to create attractive corridors along road frontages.
- To provide a desirable and aesthetically pleasing working environment.
- To create areas for landscaping of development and integration of buildings into bushland.

- To provide continuity of green space and the tree canopy for habitat maintenance.
- Identify and retain visually important stands of trees and vegetation.
- To ensure that Site facilities are integrated into overall Site planning to create a visually attractive estate.
- To ensure that fencing does not detract from the overall visual amenity and bushland character.

Relevant development controls include:

- Consideration shall be given to the scale, character and massing of development
- Where possible, buildings shall avoid hard geometric lines that are likely to increase impact upon the scenic landscape
- Landscaping shall be integrated in the design process
- Buildings shall be of 1 - 2 storey construction to a maximum height of 12 metres above the existing ground level
- For buildings over 12 metres in height, the applicant shall be able to demonstrate that the proposed buildings will not impact upon view corridors or the visual amenity of the local area.

The proposed IN1 zone would be directly accessible from Hart Road (off the Hunter Expressway) and include an area either side of Hart Road as well as the 60 hectares formerly used for Hydro Aluminium production facilities.

For this assessment, it has been assumed that:

- the existing aluminium production facilities (including the stacks) would be decommissioned and removed from the Site
- the IN1 zone would be developed in a 'business park' style, with potential large format warehousing and landscaped areas
- the zone would be developed in accordance with the urban design objectives and development controls for employment areas outlined in Cessnock DCP 2010
- existing trees and vegetation would be retained where possible
- the proposed warehousing/buildings would be sited within a bushland setting to break up the extent of built form, and to integrate the zone with the adjoining land uses
- the Environmental Management Strategy for employment areas outlined in Cessnock DCP 2010 (or similar) would be applied to ameliorate visual issues relating to dust or light emissions from the zone.

3.5 Business Park (B7)

The B7 zone (38.18 hectares) would provide a range of office and light industrial uses. Unlike the IN1 zone, commercial/office premises and rural supplies are permitted with consent. Also permitted with consent are businesses such as bulky goods premises, garden centres, and hardware supplies. The zone prohibits activities such as agriculture, entertainment facilities, and camping grounds.

Cessnock DCP 2010 does not provide specific guidance for the development of B7 zones.

The B7 zone is proposed to be located on the southern side of the Hunter Expressway. It would be accessed from the Hart Road exit, which links the Hunter Expressway to the

community of Weston. There are some business premises in this vicinity, as well as equine businesses.

For the purposes of this assessment, it has been assumed that the business park would comprise large format warehousing within landscaped grounds, and that existing trees would be retained where possible generating a bushland setting for the business park. It is also assumed that significant planting would occur in specific locations where views from residential properties would be possible. Further, the business park would be required by Council to provide an 'attractive' entrance.

3.6 Heavy Industrial (IN3)

Zone IN3 is provided for those industries that need to be separated from other land uses. Industry such as freight transport facilities, hazardous or offensive storage establishments, and distribution centres are permitted with consent.

Cessnock DCP 2010 provides specific requirements for IN3 subdivision. In considering an application for IN3 subdivision, Council considers whether the size of the lots are able to provide for landscaped areas, and the overall pattern of lot sizes in the locality and the type of industrial activity characteristic of the locality in which the subdivision is located. The DCP requires industrial land uses be compatible with adjacent commercial and or residential areas.

The 34.38 hectares of the Site proposed as the IN3 zone, is west of the former Hydro Aluminium production facilities, on an area generally cleared of vegetation. The area is surrounded by existing dense native vegetation to the north, west and south. Access to the IN3 zone would be from the proposed IN1 zone.

As with the proposed IN1 zone, the requirements set out in Cessnock DCP 2010 for the environmental management and urban design of employment areas could be applied to the IN3 zone to generate an attractive industrial area. It has been assumed for this assessment, that an Environmental Management Strategy would be prepared and applied, and that there would be no visual issues relating to dust or light emissions from the zone. It has also been assumed that the development controls for employment areas (as set out in Cessnock DCP 2010) would be applied and that the zone would therefore be developed with:

- Buildings typically a maximum height of 12 metres
- Trees planted where possible to visually integrate the buildings into a bushland setting
- An open streetscape with substantial areas for landscaping and screen planting
- Important stands of trees and vegetation retained
- Attractive corridors along road frontages
- Continuity of green space and the tree canopy for habitat maintenance.

3.7 Public Recreation (RE1)

Public recreation RE1 zones have been proposed in conjunction with the low-density residential zone. The RE1 zone enables land to be used for public open space or recreational purposes. There are no criteria regarding RE1 in Cessnock DCP 2010.

In total, 14.17 hectares of the Site is proposed to be rezoned RE1. The RE1 zone would fulfil different purposes depending upon its size and location:

- Within the proposed 'Residential Southern' area (refer Figure 3-1) are two areas each approximately 0.5 ha in size proposed to be zoned RE1. Each of these areas could meet the requirements of a local park and provide a local playing space within walking distance to residents.
- Within the 'Residential Central' area are two larger proposed RE1 zones. One of these areas is large enough to meet the needs of a local sporting field, however, is within the 1 in 100 flood zone (raising potential topographic and drainage issues). The primary purpose of the second area is possibly for environmental purposes (drainage, topography), however, a local park could be likely within this area.
- Within the 'Residential Central' and 'Residential Northern' areas are pockets of RE1 zoning between the proposed residential area and the South Maitland Railway line. These proposed RE1 zones are unlikely to fulfil a recreational purpose given their shape, location and size, however, they may be meeting environmental purposes (protecting topography and drainage lines), and providing a visual benefit (allowing a narrow vegetated buffer to be planted between the residential zone and the rail line).

For the purposes of this assessment, it is assumed that the RE1 zones within the residential area are generally flat, open green spaces with some tall trees for shade and amenity. It is assumed that the RE1 zones adjacent to South Maitland Railway line would be vegetated to diffuse views of the railway line from residents.

3.8 Neighbourhood Centre (B1)

Within the proposed 'Residential Central' area, a half-hectare neighbourhood centre is proposed. The B1 zone provides for a range of small-scale retail, business and community uses that serve the needs of people who live or work in the surrounding neighbourhood.

It is assumed the proposed B1 zone would be at a scale compatible with the surrounding low-density residential development, and comprise structures compatible in character to the residential area.

4.0 Assessment of Landscape Effects

This section describes the effects of the Proposal on existing landscape character. It identifies the key changes that would occur to the existing visual quality of the landscape, and considers the visibility of the landscape – that is, how often and easily the landscape is seen.

This assessment only considers the proposed rezoning and its assumed landscape and visual character (as outlined in Section 3.0). Decommissioning, construction and other phases of Site development have not been considered for their visual effect in this assessment.

The change to each of the identified landscape character areas of the Site is described below.

4.1 Rural floodplain

Visibility

The rural floodplain is seen from residential areas located to the north of the Site, such as Kiah Road and Hungerford Lane. The rural landscape enhances the rural vista from these properties.

Character change

Most of the rural floodplain is proposed to be zoned Environmental Conservation (E2). The character of the floodplain is likely to be maintained under this zone.

Areas of the Site proposed to be rezoned E2 would likely be subject to an 'improve or maintain' management regime. The landscape character of these areas would therefore likely remain as areas of dense native forest and cleared pastures. Existing stands of vegetation could increase in size. Flooding and the high water table may prevent total coverage of trees. Wetland vegetation would likely inhabit the lower lying areas.

Assessment

There would be minimal visual change to the rural floodplain on the Site. The proposed E2 zoning would support the current character of the rural floodplain.

4.2 Pastoral slopes

Visibility

The pastoral slopes west of the South Maitland Railway line are viewed from properties to the north – Kiah Road and Hungerford Lane.

The pastoral slopes east of the South Maitland Railway line are seen from neighbouring residential areas, such as Gillieston Heights, and from Main Road. Along Main Road in particular, the pastoral character area is one of the few remaining rural areas along this stretch of road rapidly redeveloping from rural to residential.

Character change

The pastoral slopes west of the South Maitland Railway line are proposed to be largely maintained as rural and would be zoned Rural Landscape (RU2). The RU2 zone would provide larger residential lot sizes suitable to retain features such as trees and views, and help maintain a similar character to the existing rural landscape character. Although larger rural enterprises, such as the existing poultry facility, would be unlikely to continue (due to insufficient land size), the general rural landscape character would continue, however, with the addition of more dwellings, roads and associated rural residential infrastructure.

Pastoral slopes east of the South Maitland Railway line are proposed to be zoned Low Density Residential (R2), including some areas of Public Recreation (RE1) and a Neighbourhood Centre (B1). The visual change to these partially vegetated, partially open-pasture areas would be significant. The land would be cleared and lots would be levelled. A similar residential style as is occurring along Main Road (brick and tile houses on concrete slabs) would likely be developed.

Assessment

The effect of the Proposal on the pastoral slopes west of the South Maitland Railway line would be a loss of the existing relatively undisturbed rural character to a more semi-rural one that has more built elements such as houses, sheds and roads. The rezoning would support a general rural character, although housing would be more intensive than the existing pastoral area.

The effect of the Proposal on the pastoral slopes east of the South Maitland Railway line would be substantial. The rezoning would change the character from pastoral to residential - from an open, rural character, offering distant views, to a built, suburban landscape with more limited views.

4.3 Shrubby bushland

Visibility

Shrubby bushland wraps around the north and east of the existing industrial facilities and can be seen from elevated surroundings with a view of the Site infrastructure. It is also visible to users of the Kurri Kurri Speedway (located within the Site boundaries), and is likely to be visible from the proposed 'Residential Southern' R2 zone.

Character change

Most of the low-lying areas of shrubby bushland are proposed to be zoned Environmental Conservation (E2). Although this zone permits agricultural uses, the topography and geology of the bushland is not well suited to agricultural activities. Therefore, it is likely that the existing landscape character would be maintained, and vegetation and water bodies would be conserved within the zone.

However, the higher areas of shrubby bushland immediately adjacent to the facilities would be cleared to provide for an expanded General Industrial (IN1) zone. The proposed IN1 zone is double the size of the existing facilities area (at 125.5 hectares compared to the existing 60 hectares); therefore, the bushland north and east in this vicinity would be cleared to provide for the anticipated IN1 zone activities such as warehousing, roads etc.

Although not as tall as the forest to the west of the industrial facilities, the lower bushland still provides an important green buffer around the industrial area. Clearing this vegetation and therefore reducing the width and density of the surrounding buffer, could mean that some parts of the proposed future development would be more exposed to view from elevated residential areas in the north and east, albeit with potential for landscape screening in the longer term.

The assumed character of the IN1 zone ('visually attractive buildings within the landscaped and bushland setting') requires that, where possible, trees would be protected and incorporated into the proposed industrial layout. However, the extent of the existing bushland overall would reduce.

The proposed E2 zone would also apply to part of the Kurri Kurri Speedway. The Speedway is elevated from the surrounding sandy bushland. It has not been determined whether an alternative use for the Speedway will be proposed. Therefore, for this assessment, it has been assumed that the Kurri Kurri Speedway would continue as a recreational resource within the proposed E2 zone.

Assessment

The effect of the Proposal on low-lying shrubby bushland areas would be minimal. However, the higher areas of shrubby bushland would change substantially, being cleared to provide for the proposed expanded industrial area. This would potentially increase exposure of the facilities from the north and east from some viewpoints as assessed in Section 5.0.

4.4 Forest

Visibility

The green canopy of the forest is visible from higher elevated areas surrounding the Site, such as parts of Kurri Kurri, from residential areas north of the Site (Gillieston Heights, Kiah Road and Hungerford Lane) and rural-residential areas to the northwest (Bishops Bridge and Farley).

Character change

Most of the forested area is proposed to be zoned Environmental Conservation (E2). Within this area are several electricity transmission corridors and service roads that would need to be maintained. However, except for these areas of clearing, the E2 zone would provide for conservation of the forested area, protecting the green canopy into the future.

The forest immediately west and south of the existing aluminium production facilities, however, is proposed to be zoned General Industrial (IN1) to provide for the proposed expanded industrial area. Therefore, the forest in this vicinity would be cleared to provide for the anticipated IN1 zone activities such as warehousing, roads etc. The assumed character of the IN1 zone requires that, where possible, trees would be protected and incorporated into the industrial layout. However, overall the extent of the forest around the production facilities would reduce.

West of the existing aluminium production facilities, centring on the forest clearing associated with plant operations, the Heavy Industrial (IN3) zone is proposed. The proposed IN3 zone is significantly larger than the existing cleared area (at 34.38 hectares

compared to approximately six hectares of existing cleared forest); therefore, a large section of the forest in this vicinity would be cleared to provide for the anticipated IN3 zone activities. The assumed character of the IN3 zone ('Important stands of trees and vegetation retained') requires that trees would be conserved and incorporated into the industrial layout where possible; however, the density and extent of the forest overall would reduce.

Assessment

Where the E2 zone is proposed, the effect of the Proposal on the forest would be minimal.

In those locations where the forest is proposed to be removed and replaced with IN1 and IN3 zones, the effects would be more significant. The proposed IN1 and IN3 zones are located on high areas of the site; therefore, the loss of tree canopy in these areas could be visible from some elevated areas in the surroundings, and could open views up into the proposed industrial areas.

The assumed character of the industrial zones used for this assessment, however, would lessen the potential visual effect. Additional mitigation measures have been identified in Section 6.3.

4.5 Industrial

Visibility

As noted above, the industrial character area of the Site is located on an elevated plateau surrounded by a buffer of vegetation – taller, forest vegetation south and west, and lower shrubby bushland vegetation north and east. The stacks of the former production facility are tall, and reach well above the height of surrounding trees. Consequently, the stacks are seen from numerous locations in the surroundings – such as Kurri Kurri urban area, Gillieston Heights and rural-residential areas of Bishops Bridge/Farley.

In several locations, the buildings and lower infrastructure of the former production facility are also seen - such as from properties along Bowditch Avenue and Kiah Road. The exposed nature of the production facility buildings is a result of exposure provided by landform and lack of trees within the production facility area, height of the Site facilities, and lower height of trees between the facilities and residential viewing areas.

The existing industrial character area is also likely to be visible from the proposed R2 zones 'Residential Southern', 'Residential Central' and 'Residential Northern'.

Character change

The industrial character area is proposed to be zoned General Industrial (IN1). The assumptions for this zone were outlined in Section 3.4, including:

- Decommissioning and removal of the existing aluminium production facilities (including the stacks)
- Development of the IN1 zone in a 'business park' style
- Retention of existing trees and vegetation where possible
- Siting the proposed warehousing/buildings within a bushland setting
- Constructing buildings of 1 - 2 storey, with a maximum height of 12 metres above the existing ground level

- Applying a suitable Environmental Management Strategy to ameliorate visual issues relating to dust or light emissions from the zone.

With the removal of the stacks, the most visible industrial feature of the Site would be eliminated from view. Further, the general bulk of the existing industrial area would reduce with the application of design measures presented in this report. The assumed bushland setting would promote warehousing within vegetated areas, replacing the existing extent of continuous built form devoid of trees.

However, the extent of industrial area within the Site overall would increase with the proposed expansion of the existing industrial area and a new heavy industrial area. The size of the industrial area potentially able to be viewed is more than double the area of the existing industrial facilities. Potential views from Kiah Road and Hungerford Lane of the expanded General Industrial area could be possible. To limit exposure, supplementing the existing bushland north and east of the industrial area with tall, dense plantings of trees could help screen the industrial area.

The heavy industrial area is likely to be screened from view from the new 'Residential Southern' area by landform, and the buffer of forest between the General and Heavy Industrial areas would help to screen views from Gillieston Heights. However, potential views from Kiah Road and Hungerford Lane of the proposed Heavy Industrial area could be possible. To limit exposure, it would be essential to introduce trees throughout the proposed heavy industrial area to visually integrate the buildings, and provide areas of screen planting north and east of the proposed zone.

Assessment

Although the stacks could have nostalgic value for some residents, the removal of the stacks, would in general, improve the outlook from properties where the view is currently affected by the tall concrete pillars, such as properties along McLeod Road, and from the Kurri Kurri urban centre.

The total area of the Site designated for industrial activity (IN1 and IN3) would increase under the Proposal, however, for those with views of the existing industrial area, the outlook overall would be likely to improve in character.

The removal of the existing Site infrastructure, together with application of design measures (as outlined in this report) to develop the future industrial area, would likely produce an improved, attractive, less intrusive industrial area. These measures, including a continuous tree canopy and suggested 12 metre maximum building height, would minimise potential views of infrastructure within the zone, and provide a 'green' outlook from a distance, facilitating a better view for existing and future residents. Screen planting north and east of the proposed industrial areas is an additional important measure to reduce visual impact and limit adverse views of the industrial area.

4.6 Southern residential

Visibility

The southern residential character area has limited exposure. The residential areas of Loxford are only seen from the publically accessible roads (McLeod Road and Bowditch Avenue) and limited views from parts of the TAFE campus.

The McGarva/Horton Road residential area near the Hart Road/Hunter Expressway off-ramp is visible briefly from Hart Road.

The Scales Avenue residential area near the Hart Road/Hunter Expressway on-ramp is not publicly visible, being located along a private accessway.

Character change

The southern residential area of McLeod Road, Dawes Avenue and Bowditch Avenue, is proposed to be zoned Low Density Residential (R2). The bushland and rural properties along these roads would be replaced with more intensive residential development. Therefore the character would change substantially from a rural / bushland setting to a residential brick and tile development. Figure 4-1 shows a view of Dawes Avenue. The rural character of the area would change to low-density residential with the proposed zoning.



Figure 4-1 View of Dawes Avenue

The Scales Avenue residential area (near the Hart Road/Hunter Expressway on-ramp) is proposed to be zoned General Industry (IN1). The bushland and rural properties in this area would be replaced with large scale warehousing and its associated infrastructure in a bushland setting.

The McGarva Avenue/Horton Road residential area (near the Hart Road/Hunter Expressway off-ramp) is proposed to be zoned business park (B7). Offices, car parking, and trees would replace these residential properties to create a business park with a bushland setting.

Assessment

The character of these residential areas would change substantially under the Proposal. However, these residential areas are not widely available to view. Moreover, the scenic quality of these areas is adversely affected by the proximity of the Hunter Expressway, the South Maitland Railway line, and currently the former aluminium production facility.

4.7 Southern forest

Visibility

The bulk of the southern forest character area is densely vegetated and not visible from publicly accessible areas. Residents of Weston, and travellers using Government Road

and Hart Road can see the external, forested edges of the southern character area. The forest-lined roads provide a bushland view for residents of Weston.

Character change

The southern forest area is proposed to be zoned Environmental Conservation (E2), with a Business Park (B7) zone centred along Hart Road.

The areas proposed to be zoned E2, are generally visually and physically inaccessible. They comprise dense vegetation. The E2 zone would conserve the forested area.

The proposed B7 zone would result in the removal of vegetation along Hart Road to provide for business activities and infrastructure. It is assumed for this assessment that trees would be retained where possible, however, extensive clearing would nonetheless be likely.

The proposed business park would comprise large format warehousing within a bushland setting. Trees would be planted throughout the zone.

The proposed B7 zone would generally be screened from residential properties of Weston by existing vegetation on properties surrounding the zone. The exception is the Hart Road/Government Road intersection. The southern extent of the proposed B7 zone reaches the intersection, and views down Hart Road of the new business park may be possible from some residential properties in the vicinity of the intersection. An 'attractive' entrance including extensive planting should be planned at the intersection of Government Road and Hart Road, as well as at the northern approach to the B7 zone from the Hunter Expressway.

It is also assumed that significant planting would occur in specific locations within the B7 zone where views from residential properties would be possible.

The B7 zone is unlikely to be visible from the existing Mitchell Avenue industrial hub or from Weston residential properties.

Assessment

Minimal visual change would result in the areas proposed to be zoned E2.

The proposed B7 zone, however, represents a significant change from the existing character along Hart Road. It is likely that significant clearing would occur along Hart Road to provide for the zone, replacing the forest-lined, bushland character. The proposed bushland setting, screening and entrances of the business park would help integrate the proposed zone with the forested surroundings and provide an 'attractive' setting for the employment zone.

An additional measure to help integrate the built form would be to introduce a height limit for buildings so that they did not dominate the setting and overshadow the canopy, particularly along Hart Road.

5.0 Assessment of visual effects

This section describes the likely visual effects of the Proposal on views and visual amenity. It considers the likely change to views for people living, working and travelling in the area, and how certain groups of people may be specifically affected by the changes.

Groups of people who may be affected by changes in view were identified in Section 2.3 ('Observer Locations'). Potential changes to their visual amenity are described below.

5.1 Kurri Kurri Town Centre

Change to views

Kurri Kurri town centre comprises the largest group of people potentially affected by changes in view. As noted, the Site stacks and tops of taller Site buildings are visible from select locations throughout Kurri Kurri. The Proposal would result in removal of the Site stacks and other tall Site infrastructure. No other existing Site elements, except the forested tree canopy, are visible from Kurri Kurri.

No new infrastructure resulting from the proposed rezoning would likely be visible from Kurri Kurri. The new industrial area proposed in the location of the existing production facilities would have a maximum height of 12 metres; therefore, new developments within the Site would be unlikely to be visible above the tree canopy or landform when viewed from Kurri Kurri.

Assessment

The proposed rezoning and resulting removal of the Site stacks, would improve the view from Kurri Kurri.

5.2 Weston

Change to views

Views for residents, commuters and other travellers accessing Hart Road, would change from the existing bushland outlook where trees are the dominant element, to a more urban, business park environment (B7 zone) largely cleared of the existing vegetation, with car parking and landscaped grounds, and where office buildings/warehousing would be the dominant element.

In addition, when travelling north along Hart Road, although the Site stacks would no longer be seen, the proposed IN1 zone (warehousing etc) would be visible to road users as they approach the Hunter Expressway on-ramp. Presently the Site areas adjacent to the on-ramp and the approach to the existing industrial area are forested. The Proposal would extend the industrial area along Hart Road toward the Hunter Expressway, so parts are likely to be visible to a greater number of road users, particularly before any new landscaping/planting matures.

The business park is not likely to be seen directly by residents of Weston. A view indicating the vegetation that wraps around the B7 zone blocking views from properties along Government Road is shown Figure 5-1.

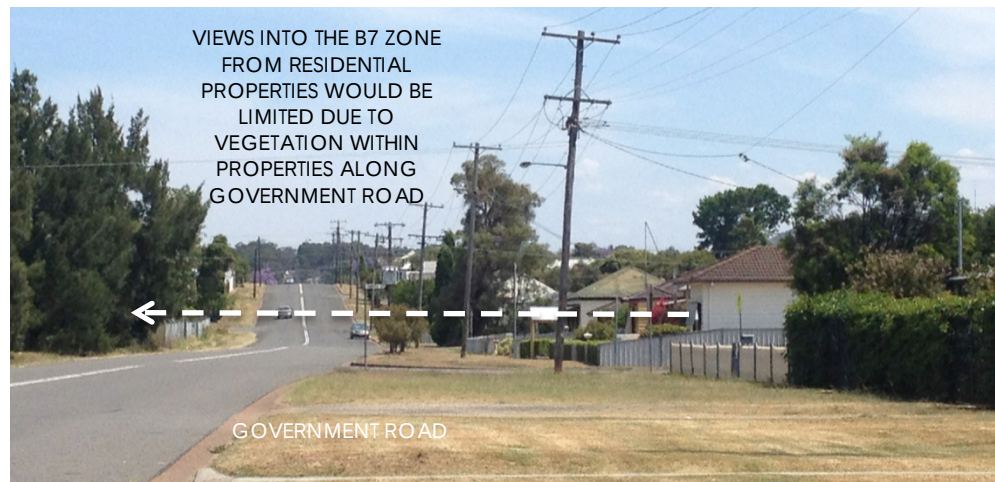


Figure 5-1 View toward Kurri Kurri from Gingers Lane/Government Road

Assessment

The Proposal would result in significant change to views for users of Hart Road. The removal of vegetation and consequent development of the B7 zone, and extension of industrial area along the north of Hart Road would be a significant change in visual amenity.

Design measures to integrate the business park, screen potential views to residential properties, and limit the height of buildings, would help make the business park 'attractive' and provide a pleasant outlook for road users.

5.3 Loxford

Change to views

As the Proposal would result in removal of the Site stacks, these industrial features would no longer be seen from the McLeod Road overpass, or from the proposed low-density residential properties that would line McLeod Road following rezoning.

From within the proposed R2 zoned properties along Bowditch Avenue, it is likely a direct view of the proposed General Industrial zone would be possible, and there would be a greater number of residents living along Bowditch Avenue that could possibly view the Site following the rezoning than currently reside there.

With incorporation of the design measures outlined in this report (continuous tree canopy, restrictions on building height, screen planting etc), the outlook from future Bowditch Avenue properties, although still of an industrial area, would be significantly improved (compared to existing views of the Site). The existing industrial area comprises tall buildings as well as the stacks, and there are no trees within the area occupied by the production facilities. The proposed industrial area would incorporate trees throughout the zone, have buildings a maximum height of 12 metres, and from a distance, the zone has a greater likelihood of visually integrating with the surrounding forest. In addition, screen planting east of the industrial zone would help filter views from the southern residential area.

Night lighting could be a visual issue for residents of the proposed residential areas along Bowditch Avenue, particularly from industry operating 24 hours/day (depending on operational restrictions applied) and from streetlights within the General Industry zone.

Tree cover could help, however, lighting would need be designed and laid out to minimise impacts on the existing and proposed residents that could view the proposed industrial area.

The proposed Heavy Industrial zone is unlikely to be visible from Bowditch Avenue.

The proposed R2 zone along Bowditch Avenue would only be visible from the agricultural parts of the TAFE campus, and views would be limited by existing vegetation that lines Bowditch Avenue and landform.

Assessment

The absence of the stacks and the incorporation of design measures outlined in this report within the proposed General Industrial zone would generally be positive, and improve upon existing views of the Site from McLeod Road and Bowditch Avenue.

It would be important for lighting to be designed and laid out to minimise impacts on the existing and proposed residents of Bowditch Avenue.

In addition, the vegetated buffer along the eastern side of the industrial zone could be strengthened (through height and density) to help filter views into the industrial area.

There would be minimal change to views from the TAFE.

5.4 Heddon Greta/Cliftleigh

Change to views

The proposed R2 zone 'Residential Central' is proposed to be developed adjacent to Cliftleigh within the Site. From most of the existing areas of Heddon Greta and Cliftleigh, it is unlikely views of the proposed R2 zone would be possible due to the low landform of the area. Furthermore, closer to Heddon Greta and Cliftleigh residential development is occurring at a rapid pace, and is more visually prominent due to its proximity than the proposed R2 zone.

From the existing areas of Heddon Greta and Cliftleigh, the industrial area of the Site is not visible, being blocked from view by landform and vegetation. Even from within the proposed R2 zone, although they would be closer to the former production facilities, the South Maitland Railway line traversing the Site is likely to limit views into the proposed industrial areas.

Assessment

The proposed industrial zones of the Site are unlikely to be seen from existing or proposed residential areas around Heddon Greta/Cliftleigh.

The proposed R2 zone is unlikely to be visible. In addition, it is likely that there is a strong awareness and expectation of change among residents due to the rapid pace of development in the surrounding area. Throughout the vicinity, rural properties are being converted to low-density residential estates. The Proposal would extend the area of low-density residential visual character currently occurring.

5.5 Gillieston Heights

Change to views

For residents of Gillieston Heights with views of the proposed Rural Landscape zone west of the South Maitland Railway line, the outlook toward this section of the Site would remain generally rural in character, however, there would be more dwelling houses on smaller lots from some viewpoints.

The proposed General Industrial zone could be visible for some residents of Gillieston Heights, and possibly distant glimpses of the proposed Heavy Industrial zone. Overall, however, it is anticipated that the view toward the proposed industrial area from Gillieston Heights would improve (compared to the view of the existing industrial area) as a result of the removal of Site stacks, and the inclusion of tree planting and screening within the zone that would reduce the building mass. In addition, the Gillieston Heights residential area is a considerable distance from the proposed industrial zones on the Site (i.e. over four kilometres away). A view of the Site from Gillieston Height's sports field toward the Site is shown Figure 5-2.



Figure 5-2 View toward the Site from near Gillieston Heights Sports Field

From some areas of Gillieston Heights, views of the neighbouring proposed Low Density Residential (R2) zone (east of the South Maitland Railway line) would be possible. The R2 zone would include Public Recreation (RE1) areas and a Neighbourhood Centre (B1). The view toward the proposed R2 zone would be similar to that common in the surrounding area of residential estates. A view from Gillieston Heights is shown Figure 5-3.

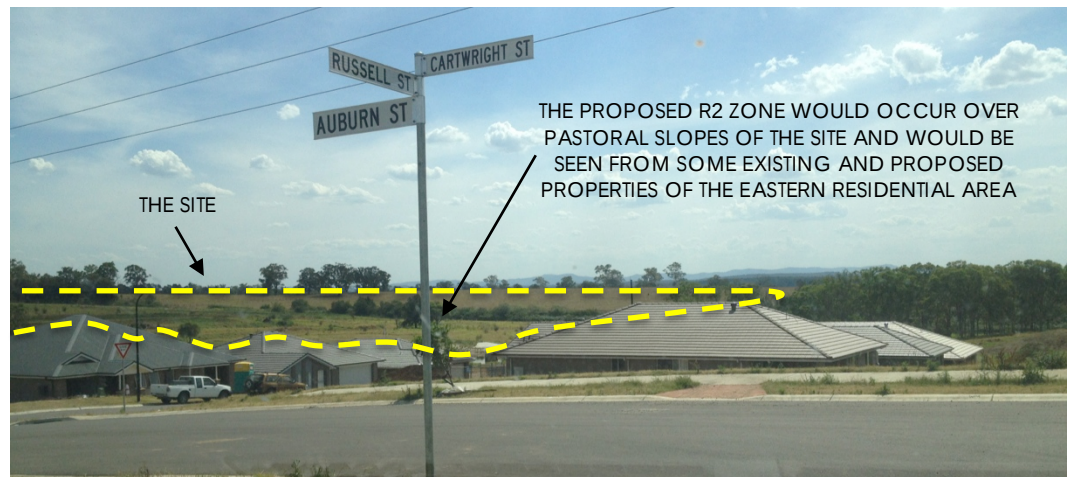


Figure 5-3 View toward Pastoral Slopes of Site from Cartwright Street, Gillieston Heights

From the proposed residential area south of Gillieston Heights there are likely to be views of some of the proposed industrial areas of the Site, yet once new tree planting is established this would be minimal if at all.

Assessment

The view toward the proposed industrial area from Gillieston Heights (existing and proposed residents) would likely improve (compared to the view of the existing industrial area) as a result of the removal of Site stacks, and the inclusion of the design measures outlined in this report, such as tree planting and screening within the zone, which would reduce the building mass.

Regarding views of the proposed R2 zone, although there would be visual change for existing and proposed residents of Gillieston Heights, it is likely there is a strong awareness and expectation of change among residents due to the rapid pace of development in the surrounding area. Throughout the vicinity, rural properties are being converted to low-density residential estates. The Proposal would extend the area of low-density residential visual character currently occurring.

5.6 Main Road

Change to views

The proposed areas of R2 zone adjacent to Main Road would have the most exposure. Views of the Site for Main Road travellers would change substantially from rural to residential. However, along Main Road, residential estates are being developed both sides of the busy thoroughfare. Given the extent of residential change along the road, it is likely there is a strong awareness and expectation of future change among road users.

Assessment

The view from Main Road to the proposed R2 zone would be consistent with the neighbouring residential development along this road and in the surrounding suburbs. Although there would be visual change, it is likely there is a strong awareness and expectation of change among road users due to the rapid pace of development in the surrounding area. The Proposal would extend the area of low-density residential visual character currently occurring.

5.7 Kiah Road/Hungerford Lane

Change to views

Views from Kiah Road and Hungerford Lane of the rural floodplain are not proposed to change. The floodplain would be zoned Environmental Conservation, protecting the existing rural character and the rural outlook available from northern properties.

It is possible that residents of Kiah Road and Hungerford Lane could view the proposed rural landscape (RU2) zone on the pastoral slopes west of the South Maitland Railway line. The outlook toward this section of the Site would remain generally rural in character; however, it is likely there would be more dwelling houses on smaller lots.

Presently, the most significant view toward the Site is of the existing industrial area, including the stacks, even though these views are over four kilometres away. The proposed General Industrial zone is likely to still be visible from Kiah Road and Hungerford Road properties, however, it is anticipated that the view would improve as a result of the removal of Site stacks, and the inclusion of tree planting and screening within the zone, which would reduce the building mass.

It is also possible that Kiah Road and Hungerford Road residents could view the cleared forest and proposed Heavy Industrial zone to the west of the industrial area. Although trees would be planted within the Heavy Industrial zone, until new trees grow, the extent of land area given over to buildings, roads and other infrastructure in the view could increase, yet it would still remain a small element in the overall view due to the distance (over four kilometres away).

Overall, the size of the industrial area at the Site would increase and the size of the forest would decrease. Therefore, it is important to introduce the design measures outlined in this report within the zones (particularly maintaining a tree canopy within the zones and muted colours) to minimise adverse views from the north. In addition, tall, dense, vegetated buffers along the north and northeastern sides of both industrial zones could be introduced to help prevent views into the industrial area.

Night lighting at the new industrial areas could also potentially be seen by residents of Kiah Road and Hungerford Lane, yet at over four kilometres away.

Assessment

The effect of the Proposal on the rural floodplain would be minimal.

The change to rural landscape for pastoral land west of the South Maitland Railway line would affect the southeastern outlook for residents of Kiah Road and Hungerford Road. A more intensive rural development would be seen, although maintenance of rural character would be promoted through the measures outlined in the Cessnock DCP 2010 and additional mitigation measures proposed within this report (provided in Section 6.2).

It is anticipated that the view toward the industrial area of the Site would improve as a result of the Proposal. However, for this to occur, the design measures outlined in this report would need to be incorporated throughout the zone. These design measures are also essential throughout the Heavy Industry zone.

The introduction of the proposed Heavy Industry zone, in addition to the enlargement of the existing industrial area, increases the total area of buildings and infrastructure potentially seen at the site. As much existing vegetation as possible should be retained

around the industrial areas to help minimise adverse views from the north, and it would be crucial to plant trees throughout both zones to develop and maintain a tree canopy within the zone.

In addition, increasing the height and density of vegetated buffer zones north and northeast around both industrial zones would also mitigate any visual impacts.

5.8 Bishops Bridge and Farley

Change to views

Views from local roads northwest of the Site, including Ravensfield Lane, Owl Pen Lane and Quarry Road on the rural floodplain are not proposed to change. The floodplain would be zoned Environmental Conservation, protecting the existing rural character and the rural outlook available from these northwestern properties.

Some residents of this area would be able to see towards the proposed rural landscape (RU2) zone on the pastoral slopes west of the South Maitland Railway line, however, these views would be of such a distance (over 2.5 km away) that any changes would be negligible. Therefore, the outlook toward this section of the Site would remain generally rural in character.

Presently, the most significant view toward the Site is of the existing industrial area, including the stacks, yet these views are over 5.8 km away. The clearest views are from Owl Pen Lane and Quarry Road. The industrial zones are likely to still be visible from some of these properties, however, it is anticipated that the view would improve as a result of the removal of Site stacks, and the inclusion of tree planting and screening within the zone, which would screen the new buildings over time (assuming a height limit under the dominant tree canopy). There would be none, if any, views possible of the new industrial area from Ravensfield Lane due to intervening landform and trees.

Night lighting at the new industrial areas may also be seen by Owl Pen Lane and Quarry Road residents, yet at over five kilometres away.

Assessment

The effect of the Proposal on the rural floodplain and the rural landscape for pastoral land west of the South Maitland Railway line would be minimal.

It is anticipated that the view toward the industrial area of the Site would improve as a result of the Proposal once new tree planting is established. However, similar to the viewpoints around Gillieston Heights, for this to occur, the design measures outlined in this report would need to be incorporated throughout the zone. These design measures are also essential throughout the Heavy Industrial zone. In addition, increasing the height and density of vegetated buffer zones north and northeast around both industrial zones would also mitigate any visual impacts.

5.9 Hunter Expressway

Change to views

The Proposal would not change views for users of the Hunter Expressway. There is very little opportunity to see the Site from the Expressway, with the exception of the on- and off-ramps and overpasses.

Assessment

The visual changes that would result at the Hart Road/Hunter Expressway on/of-ramp has been discussed Section 5.2. The visual changes from the McLeod Road overpass are discussed Section 5.3.

6.0 Mitigation Measures

This section outlines mitigation measures – design principles and recommendations - to address landscape and visual amenity issues. These measures are proposed to reduce adverse visual effects of the Proposal, and to promote a positive visual character.

Mitigation measures have been developed from professional experience and reference to relevant documents that include Cessnock and Maitland Council planning documents, the *Lake Macquarie Scenic Management Guidelines* (Lake Macquarie City Council, 2013) and *Visual Landscape Planning in Western Australia* (Western Australian Planning Commission, 2007).

Recommended mitigation measures for each of the proposed zones are listed below.

6.1 Low Density Residential zone

- Apply the relevant visual amenity provisions of Cessnock DCP and Maitland DCP throughout the proposed low density residential zone, including:
 - o Houses to be sited to retain special features such as trees and views
 - o Vegetation which adds significantly to the visual amenity or which is environmentally significant or of habitat value to be conserved in the design of the subdivision proposal (and should be mapped accordingly at the masterplan stage)
- Plant a dense buffer of native vegetation between the residents of the R2 zone and the elevated South Maitland Railway line to screen the line from nearby residential properties, streets and parks.
- Where possible align streets so that views remain possible at the end of streets over the rural area (through street design and retaining view corridors with well-located parks and pathways for example).
- Along Main Road, provide amenity planting to reduce the visual impact of the extensive areas of residential development occurring in the vicinity.
- Maintain visual breaks between surrounding land use areas to reduce the perception of urban sprawl e.g. via green breaks, vegetated ridgelines and maintaining existing planting where possible (such as between the proposed R2 zone and the TAFE).
- Plan for attractive streets with sufficient space for large street trees or other adequate landscape buffers (such as along Main Road – refer Figure 6-1).
- Establish a visual hierarchy of streets that includes differentiation of a main street to create a community focus where appropriate.
- Create pleasant public spaces and parks, and use these to protect and maintain existing site trees.
- Minimise cut and fill through design measures such as the appropriate layout of roads, which will also reduce vegetation loss. Where cut and fill is unavoidable benching of new home sites and provision of retaining walls to unify the site should be considered. Areas for planting should also be identified.
- Width of driveways at the street edge should be kept to a minimum to allow for the greatest area to be available for street trees and to reduce the visual dominance of driveways.



Figure 6-1 Street trees can greatly improve the visual quality of new residential areas

- Address surrounding main street frontages through orientating housing towards streets, where direct access is not possible consider using techniques such as narrow service roads and thereby avoid unattractive rear fences facing main streets (if not possible then landscape planting should be imposed to improve any views of fencing).

6.2 Rural landscape zone

- Apply the relevant visual amenity provisions of Cessnock DCP throughout the proposed rural landscape zone, including:
 - o Maintain the rural landscape character of the land.
 - o Retain features such as trees and views.
 - o Vegetation which adds to the visual amenity of the locality and / or which is environmentally significant is to be preserved in the design of the subdivision proposal.
 - o Buffers are to be provided to existing development on adjoining agricultural properties.
- Plant a dense buffer of native vegetation between the residents of the rural landscape zone and the elevated South Maitland Railway line to screen the line from the residential properties.
- Locate potential building envelopes prior to subdivision approval, to ensure that each proposed lot is suitable to achieve the amenity outcomes. Building envelopes should be sited to avoid the loss of large trees.
- Fencing should be of a rural style, such as timber post and wire strand fencing, or timber post and rail. Colourbond or other similar solid fencing should not be used.
- Maintain unformed rural road edges (i.e. not kerb and gutter), refer Figure 6-2.



Figure 6-2 Unformed road edges are typical of rural environments

6.3 Industrial zones

- In both the proposed General Industrial (IN1) zone, and the Heavy Industrial (IN3) zone, apply the criteria specified in Cessnock DCP regarding environmental management and development controls for urban design of employment areas.
- Develop and apply a suitable environmental management strategy to the industrial zones:
 - o Ensure a high level of environmental protection by incorporating measures into development to ameliorate impacts from noise, air and water pollution, dust, lighting, traffic, etc onto surrounding communities.
 - o Encourage innovative development that integrates well with the built form, landscaped areas and bushland setting to enhance the character of the industrial areas.
- Apply relevant urban design objectives to the zones:
 - o To promote integrated and visually attractive buildings within the landscaped and bushland setting.
 - o To provide an open streetscape with substantial areas for landscaping and screen planting.
 - o To enhance streetscapes and to create attractive corridors along road frontages.
 - o To provide a desirable and aesthetically pleasing working environment.
 - o To create areas for landscaping of development and integration of buildings into bushland.
 - o To provide continuity of green space and the tree canopy for habitat maintenance.
 - o Identify and retain visually important stands of trees and vegetation.
 - o To ensure that site facilities are integrated into overall site planning to create a visually attractive estate.
 - o To ensure that fencing does not detract from the overall visual amenity and bushland character.

- Apply relevant development controls to the zones:
 - o Consideration shall be given to the scale, character and massing of development
 - o Where possible, buildings shall avoid hard geometric lines that are likely to increase impact upon the scenic landscape
 - o Landscaping shall be integrated in the design process
 - o Buildings shall be of 1 - 2 storey construction to a maximum height of 12 metres above the existing ground level
 - o For buildings over 12 metres in height, the applicant must be able to demonstrate that the proposed buildings will not impact upon view corridors or the visual amenity of the local area.
- In addition:
 - o Increase the density of planting around both industrial zones north and northeast to help screen the areas from views from the north.
 - o Increase the density of planting along the eastern side of the industrial zone to help filter views into the industrial area from the east.
 - o Apply the environmental management strategy measures to design and set out lighting to minimise impacts on the existing and proposed residents.
 - o Plant tall trees and locate areas of screen planting where possible between residential areas and locations of intensive night lighting.
 - o Allow for substantial landscaping, including a high percentage of trees, between adjacent buildings to visually break-up the overall mass of buildings and car parks.
 - o Ensure street trees and footpaths are included to increase the overall amenity.



Figure 6-3 An industrial building elsewhere, illustrating how muted colours would make it less visible

- o Specify muted, recessive colours such as dark greys, browns and greens and not reflective surfaces so to minimise visual impacts, particularly on long distant views (refer Figure 6-3)
- o Ensure high quality treatment of facades and avoid continuous blank walls through measures such as articulation, material changes, colours, light and shade and quality building materials to achieve a high standard design result.

- o Situate car parks so as to reduce large expanses of hard surface in prominent sites by breaking car parks into smaller components and including trees.
- o Improve the look of security fencing by the use of black fencing in the most prominent areas (as black blends into surroundings and is more easily seen through) and the use of landscape screening to soften the view of fencing.

6.4 Business Park

- Apply the general visual amenity criteria specified in this report (Section 6.3) for environmental management and development controls (with the particular exception of building heights) to generate a bushland setting for the business park
- Buildings shall be limited in height so they do not overshadow or dominate the tree canopy.
- Establish a generous landscaped setback/verge along Hart Road to retain existing trees where possible.
- Provide a dense area of screen planting between the Hunter Expressway on-ramp and the proposed industrial zone.
- Promote a bushland setting with trees would be planted throughout the zone.
- Create an 'attractive' entrance including extensive planting at the intersection of Government Road and Hart Road, as well as at the northern approach to the B7 zone from the Hunter Expressway.
- Planting dense vegetation in specific locations within the B7 zone where views from residential properties could be possible.
- Specify muted, recessive colours such as dark greys, browns and greens and not reflective surfaces so to minimise visual impacts, particularly on long distant views.
- Control signage in terms of size and colours, and rationalise to minimise number of signs.
- Prevent large expanses of car parking by breaking up with landscape planting, designing smaller connected car parks and not using all of the front setback for parking.

7.0 Conclusion

Overall the visual changes that would result from the Proposal should be generally positive, assuming the proposed design measures recommended in this report are incorporated. The most significant change that would affect the largest number of people in the vicinity is the removal of the Site stacks of the former Hydro Aluminium facility that have been a dominant and recognisable industrial structure element on the local skyline for many years.

The change to the existing industrial area could improve existing views toward the Site, largely due to the removal of the stacks and the contiguous mass of industrial buildings that form the plant. The proposed industrial area would include a continuous canopy of trees and presumed additional screen planting (as set out in the mitigating design measures), and therefore, the view of the proposed General Industrial zone could potentially be totally screened in the longer term.

The introduction of the Heavy Industrial area would require a large area of forest and lower bushland to be cleared, and increase the total area of infrastructure on the Site. However, extensive planting and careful placement of buildings throughout the proposed Heavy Industrial zone (together with the introduction of the remaining suite of design measures outlined in this report) would minimise its potential visibility.

The introduction of the proposed Business Park would affect users of Hart Road. They would experience significant visual change resulting from the loss of vegetation lining the road and the introduction of buildings and commercial enterprises proposed in this location. Mitigation measures have been recommended to achieve an attractive new development and minimise any negative visual effects.

The Proposal would increase the area of low-density residential visual character currently occurring in the vicinity. However, the visual exposure of the R2 zone within the Site is limited due to the elevation of the proposed residential area (with the exception the higher section of the Site adjoining Main Road). Moreover, the view from existing residential areas to the proposed residential zones would be consistent with the neighbouring residential development along this road and in the surrounding suburbs.

The Proposal to rezone the Site would result in long-term visual change. Importantly, the most significant visual change (removal of the stacks) is positive and would improve existing views of the Site. With the introduction of proposed mitigation measures, the new industrial area, business park and rural residential areas have the potential to be attractive and visually complementary to the bushland/rural character of the vicinity. The proposed low-density residential zones would consolidate existing areas of residential development occurring in the vicinity.

8.0 References

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