Flora & Fauna Assessment

Proposed Station Street Extension within the Hunter Economic Zone

Prepared for:
HEZ Nominees Pty Ltd

Reference 23967 – December 2007

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PROJECT: ***FLORA & FAUNA ASSESSMENT, HEZ – STATION STREET EXTENSION***	
CLIENT:	*HEZ NOMINEES PTY LTD*
OUR REF	*23967*
DATE:	*DECEMBER 2007*
APPROVED BY:	*ROBERT BROWNE-COOPER*
SIGNATURE:	
CHECKED BY:	*TOBY LAMBERT*
SIGNATURE:	

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1 INTRODUCTION

RPS Harper Somers O'Sullivan Pty Ltd (RPS HSO) was commissioned by HEZ Nominees Pty Ltd As Trustees For the HEZ Unit Trust (HEZ Nominees) to undertake a flora and fauna assessment for the extension of Station Street, hereafter referred to as 'the site', within the 'Hunter Economic Zone', Cessnock LGA. Station Street is required to be extended to service subsequent industrial development within the Hunter Economic Zone (HEZ).

The proposal will involve the clearing of native vegetation including habitat for threatened species and endangered ecological communities, it will need to be assessed in accordance with the relevant provisions of the *Environmental Planning and Assessment Act 1979* (EPA Act) and the *Threatened Species Conservation Act 1995* (TSC Act).

The Station Street extension forms one component of a Part 3A application to the NSW Department of Planning (DoP).

This Flora and Fauna Assessment considers all relevant State and Commonwealth threatened species legislation and planning instruments. The report assesses the impacts of the proposal on all fauna and flora species, populations and ecological communities that are applicable to the proposal.

The results of the Ecological Constraints Master Plan (ECMP) data have been used to achieve adequate conservation outcomes for all of the threatened species and EEC's within the HEZ Study Area, which culminated in the Department of Environment and Climate Change (DECC) issuing an assumed concurrence for the development of the HEZ, in March 2005. This document advises that Council (and determining authorities under Part 5 assessment under the EPA Act) can assume concurrence for permissible development (as per the Local Environment Plan) in accordance with clause 64 of the EP&A Regulation 2000, provided the conditions within Attachment 1 of the concurrence document are met (Appendix B).

A total of twenty-eight threatened species and four EEC's have been recorded within the HEZ Study Area to date. Of these, twenty-six threatened species and two EEC's have been identified as having at least a moderate probability of being affected by the proposal. Application of Section 5A of the EP&A Act (Seven-Part Tests) to these species/communities indicated that no significant impacts would be expected as a consequence of the proposal.

1.1 Purpose and Scope

The purpose of this flora and fauna assessment report is to:

- Enable the presence or likely presence of components of biodiversity to be documented prior to the making of planning, land management and development decisions for the proposal;
- Enable planning, land management and development decisions to be based on sound scientific information and advice including detailed ecological data collected as part of the Ecological Constraints Master Plan (ECMP) process for the HEZ;
- Enable compliance with applicable assessment requirements contained within the *Environmental Planning and Assessment Act 1979*, *Threatened Species Conservation Act 1995*, the Commonwealth *Environment Protection and Biodiversity Conservation Act*

1999, and any other relevant state, regional and local environmental planning instruments including the Habitat Management Strategy (HMS).

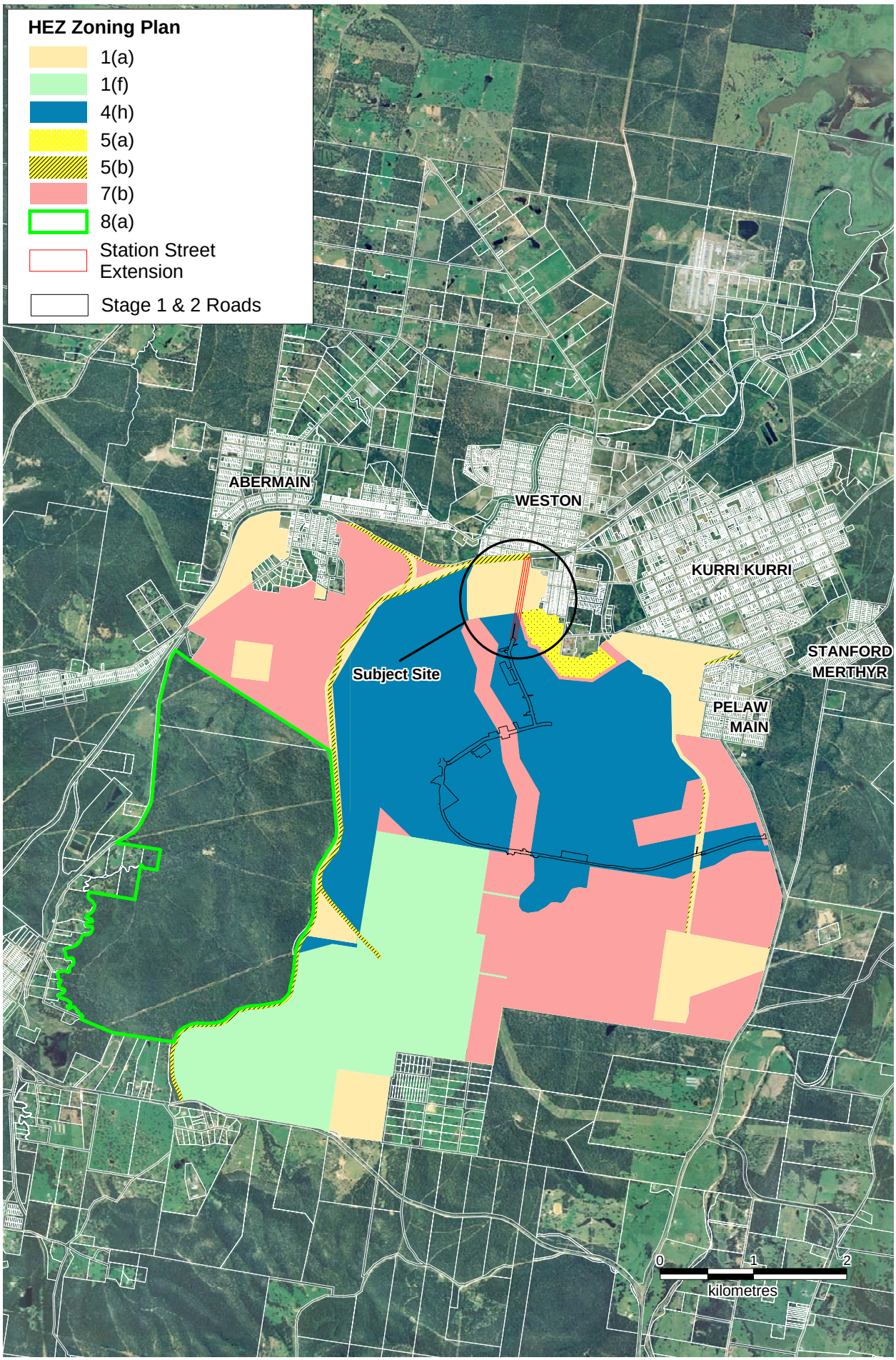
1.2 Description of the Proposal

The proposed extension of Station Street joins the existing Station Street at the intersection of the railway line in Weston with the temporary end of Stage 2 Road and is approximately 940 metres long.

The proposal is located within the HEZ LEP area, specifically within 1(a), 4(h), 5(a), 5(b) and 7(b) zoned lands. The size of the road footprint has been minimised to reduce impacts upon the ecology of the site. An important part of the design of the Station Street extension has been to incorporate existing partially cleared and degraded areas. However in order for the road to be functional some clearing of habitat is still required.

It is expected that all vegetation within the site is likely to require removal to facilitate road and associated infrastructure construction.

Figure 1-1 shows the site location in relation to the HEZ Study Area. Figure 1–2 shows the likely extent of clearing for the site in relation to existing cleared areas and existing vegetated areas. A 20 metre buffer has also been included, which allows for consideration of indirect impacts (although direct impacts are likely to be minor).



PROJECT: STATION STREET EXTENSION

CLIENT: HEZ NOMINEES PTY LTD ATF THE HEZ UNIT TRUST

TITLE: SUBJECT SITE LOCATION

CONTOUR INTERVAL: N/A

DATUM: MGA Zone 56 (GDA 94)

SCALE: 1: 48000 at A4 Size

JOB NUMBER: 23967

DATE: 4/12/2007

DRAWN: T. Lambert

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FIGURE: 1-1
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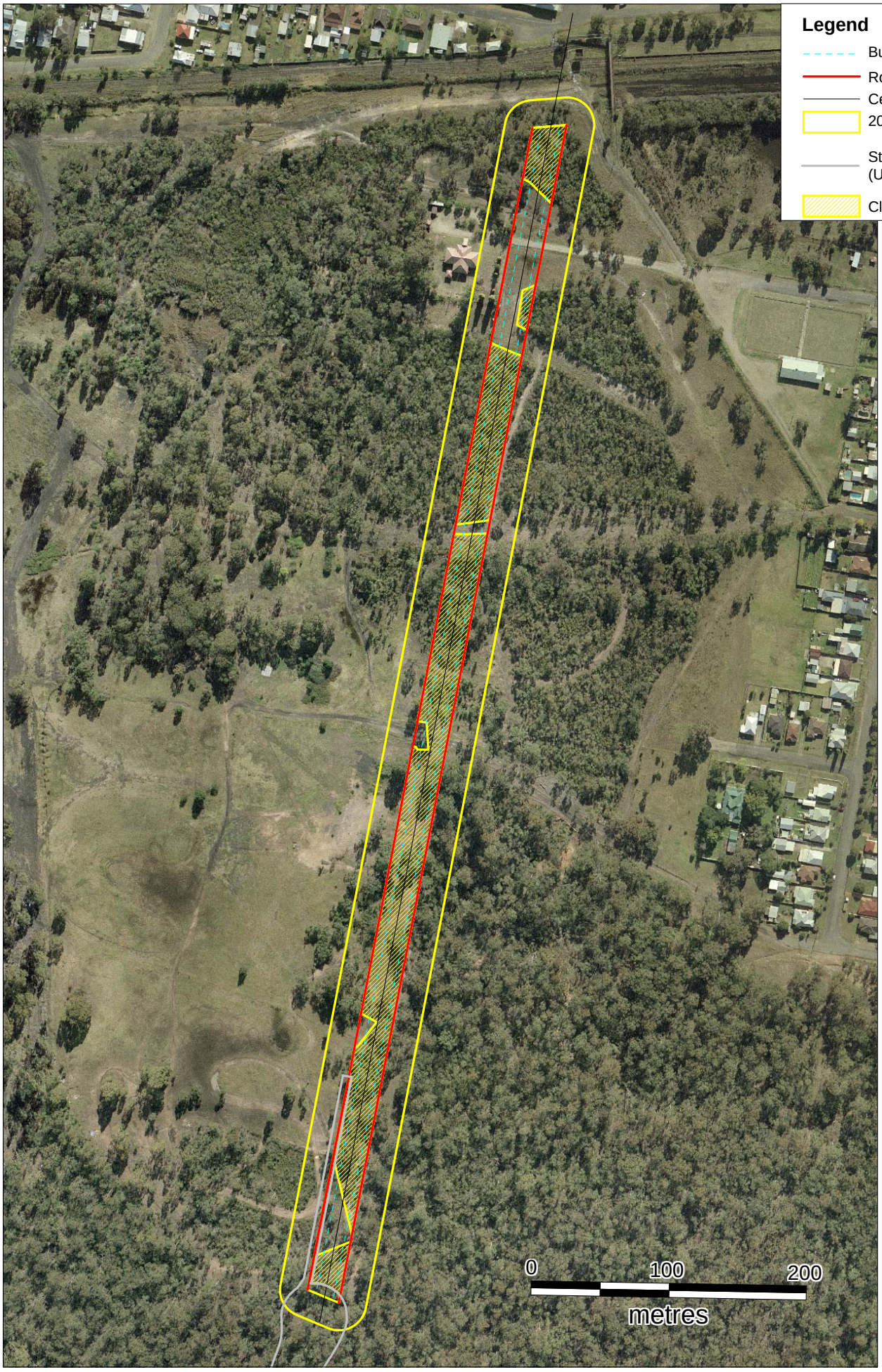
HUNTER ECONOMIC ZONE
Where industry thrives



MGA

PROJECT: STATION STREET EXTENSION

CLIENT: HEZ NOMINEES PTY LTD ATF THE HEZ UNIT TRUST

TITLE: EXTENT OF CLEARING

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FIGURE: 1-2
PAGE: 4

HUNTER ECONOMIC ZONE
Where industry thrives

CONTOUR INTERVAL: N/A	DATUM: MGA Zone 56 (GDA 94)
SCALE: 1: 5000 at A4 Size	JOB NUMBER: 23967
DATE: 4/12/2007	
DRAWN: T. Lambert	

2 METHODOLOGY

Detailed ecological investigations have been undertaken over the HEZ site as part of the Ecological Constraints Master Plan (ECMP) process. This information (including methods and results) has been previously presented in detail within a number of Flora and Fauna Assessment Reports conducted within the HEZ by RPS HSO. Most recently, this information has also been incorporated into the revised Habitat Management Strategy (HMS) (HSO, Ecotone, & CCC 2005). A summary of the ECMP methods is presented below in Section 2.1.

The results of the ECMP data have been used to achieve adequate conservation outcomes for all of the threatened species and Endangered Ecological Communities (EEC's) within the HEZ Study Area, culminating in the Department of the Environment and Climate Change (DECC) issuing an assumed concurrence for the development of the Hunter Economic Zone, in March 2005 (see Appendix B).

In addition to the methods stated below, the site was re-visited by Robert Browne-Cooper (Ecologist, RPS HSO) on the 16th November 2007 to verify the ECMP data and make any necessary changes and observations (as per HMS requirement - Schedule 1(d)).

2.1 Summary of Methods

- **Collation of existing flora and fauna datasets and survey reports** – The results of the numerous flora and fauna investigations that have been undertaken within the Hunter Economic Zone (HEZ) to date, in particular threatened species records, have been collated.

  Important information sources used include Bell (2001, 2004), Ecotone (1999; 2000, 2002a; 2002b), HSO (2002), NPWS Atlas of NSW Wildlife (2003) and University of Newcastle (2001).

- **Vegetation survey & mapping over the entire HEZ study area** – A detailed vegetation survey and mapping report was undertaken by Stephen Bell (Eastcoast Flora Survey) on behalf of Harper Somers O'Sullivan. This was undertaken to replace the broad-scale vegetation maps of the HEZ previously produced by Ecotone (1999; 2000) and House (2003), as well as that previously produced by Bell (2001) within the Werakata National Park section of the study area.

- **Detailed 4(h) development zone surveys and habitat investigations –** Detailed ecological investigations, using high accuracy DGPS (Differential Global Positioning System), were undertaken within the 4(h) development zone and the central 7(b) conservation zone corridor along Chinamans Hollow Creek. 5(a) and 1(a) lands were also surveyed at a later date using the same methodology.

- **Additional targeted threatened species surveys** – In addition to those threatened species surveys previously conducted within the HEZ study area, further targeted surveys for a select number of species were conducted so that a more comprehensive overview of the occurrence of these species within the HEZ could be attained.

It is considered that the combined survey effort of the ecological survey reports conducted within HEZ to date, has satisfied the requirements of the Cessnock City Council's Development Control Plan No. 56 "Flora and Fauna Survey Guidelines Lower Hunter

Central Coast Region 2002" and the requirements of the Director General of the Department of Planning in relation to the Part 3A Application.

3 DESCRIPTION OF THE ENVIRONMENT

Flora

Two vegetation communities have been recognised as occurring on the site, namely Lower Hunter Spotted Gum – Ironbark Forest (LHSGIF) and Kurri Sand Swamp Woodland (KSSW). The vegetation to be traversed by the road is presented in Figure 3-1.

Three (3) threatened flora species occur on the site including *Callistemon linearifolius*, *Eucalyptus glaucina*, and *Eucalyptus parramattensis subsp decadens*. These species are all listed as Vulnerable under the *TSC Act,* while *Eucalyptus glaucina* and *Eucalyptus parramattensis subsp decadens* are also listed under the *EPBC Act*. Direct impacts are likely to be limited to removal of a number of *E. parramattensis,* with one *E glaucina* also likely to be directly affected.

It was also noted that three plant species recorded within the site are listed as a Rare or Threatened Australian Plant (ROTAP). The plants include *Grevillea parviflora and Macrozamia flexuosa*. These were recorded in varying densities during these and previous investigations. These species have not been accurately located by GPS, and although of some conservation significance, they are not listed as threatened species under any State or Commonwealth Act and are relatively common throughout HEZ (including within 7(b) conservation areas).

A small number of specimens of *Eucalyptus sp aff agglomerata* have also been recorded along the proposed road alignment. While not threatened, these could possibly be a new species (Ken Hill - National Herbarium of NSW). Bell (2004) indicates that similar examples have also be observed in similar locations around Cessnock, although insufficient amount of information is available on population size and distribution. All of these are located outside of the area likely to be directly affected by the proposed road.

Refer to Figure 3-2 for locations of significant flora.

Within the wider HEZ Study Area, a total of over 382 plant taxa and five vegetation communities have been recorded to date, including nine rare or threatened plant species and five endangered ecological communities.

Fauna

A total of 239 vertebrate fauna taxa have been recorded within the HEZ Study Area to date, including 28 threatened species. The site occurs as a relatively small component of the wider HEZ Study Area and the fauna species known to occur on the site are considered to be typical of the habitats present.

No threatened fauna have been recorded within the site to date, although threatened fauna species that have been recorded in the immediate vicinity of the site include, Black-chinned Honeyeater, Powerful Owl, and Yellow-bellied Glider.

The habitat values of the site are somewhat degraded due to clearing associated with easements and previous agricultural use. Notwithstanding, a section of KSSW vegetation community in the southern area of the site is relatively intact and of high quality, and due to the site's connectivity to larger tracts of bushland, the site provides opportunities for a number of threatened fauna known from the HEZ study area.

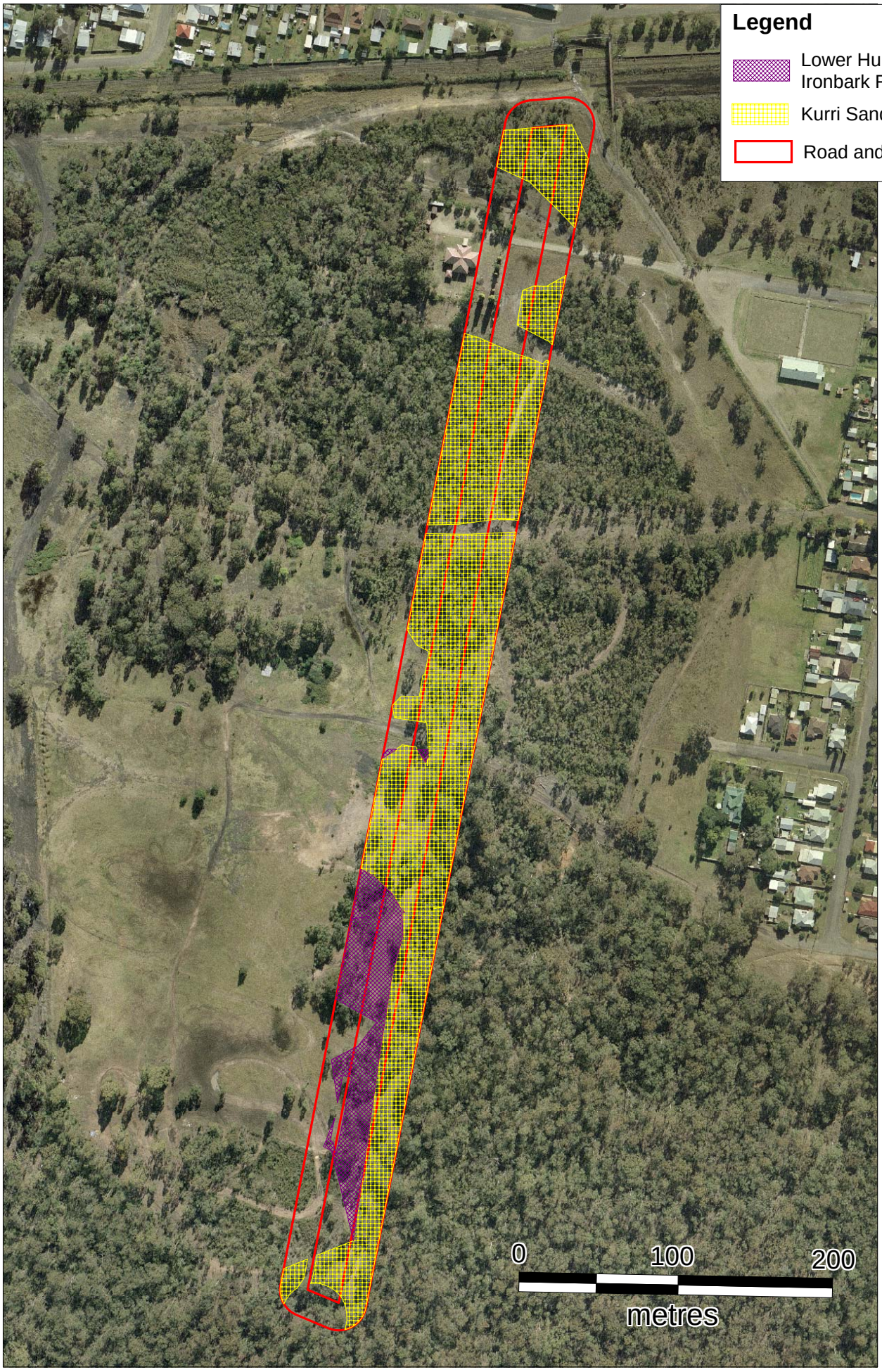
Habitat Attributes

Across the entire road alignment and 20m buffer two (2), hollow bearing trees, comprising of *Angophora floribunda* (Rough-barked Apple) containing a total of three hollows occur within the 20m buffer (but outside of the site). Specifically, the hollow bearing trees contain one hollow with diameter range 2cm to 10cm, one hollow with diameter range of 11cm to 20cm and one hollow of diameter greater than 20cm. Fourteen (14) mature trees (DBH >50cm), comprising of *A. floribunda* (Rough-barked Apple), *Corymbia maculata* (Spotted Gum), *Eucalyptus amplifolia* (Cabbage Gum), *Eucalyptus punctata* (Grey Gum), *Eucalyptus fibrosa* (Broad-leaved Ironbark), *E. tereticornis* (Forest Red Gum) are also likely to be affected. Of these, only two mature *E. punctata* and one mature *E. tereticornis* are actually within the proposed road alignment.

Figure 3-3 shows the locations of the hollow-bearing and mature trees within the road alignment.

Habitat within the southern portion of the site is a mix of cleared land, LHSGIF, and swampy cleared areas with evidence of mine subsidence, with depressions being up to 2 metres below the surrounding ground level. This area contains some threatened flora species including individual *E. glaucina* and *E parramattensis* trees as well as several mature trees. More significant habitat occurs in the central and northern portions of the site where the site traverses KSSW, and where a concentration of *E. parramattensis* is located.

The ecological attributes of the site, that would be affected by the proposal are summarised in Table 3-1.



PROJECT: STATION STREET EXTENSION

CLIENT: HEZ NOMINEES PTY LTD ATF THE HEZ UNIT TRUST

TITLE: VEGETATION MAP

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FIGURE: 3-1
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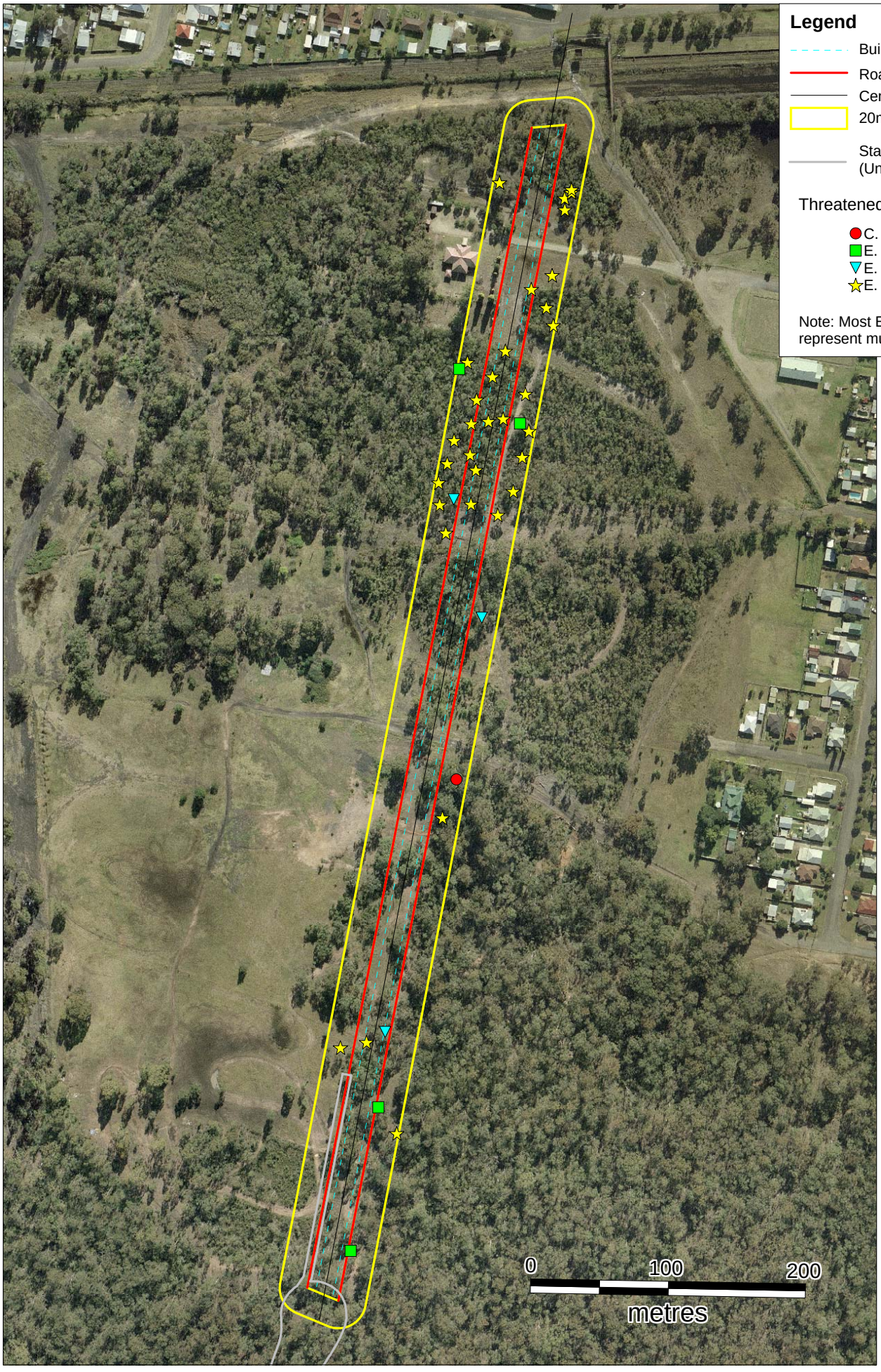
HUNTER ECONOMIC ZONE
Where industry thrives

CONTOUR INTERVAL: N/A	DATUM: MGA Zone 56 (GDA 94)
SCALE: 1: 5000 at A4 Size	JOB NUMBER: 23967
DATE: 4/12/2007	
DRAWN: T. Lambert	



PROJECT: STATION STREET EXTENSION

CLIENT: HEZ NOMINEES PTY LTD ATF THE HEZ UNIT TRUST

TITLE: THREATENED AND SIGNIFICANT FLORA

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FIGURE: 3-2
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HUNTER ECONOMIC ZONE
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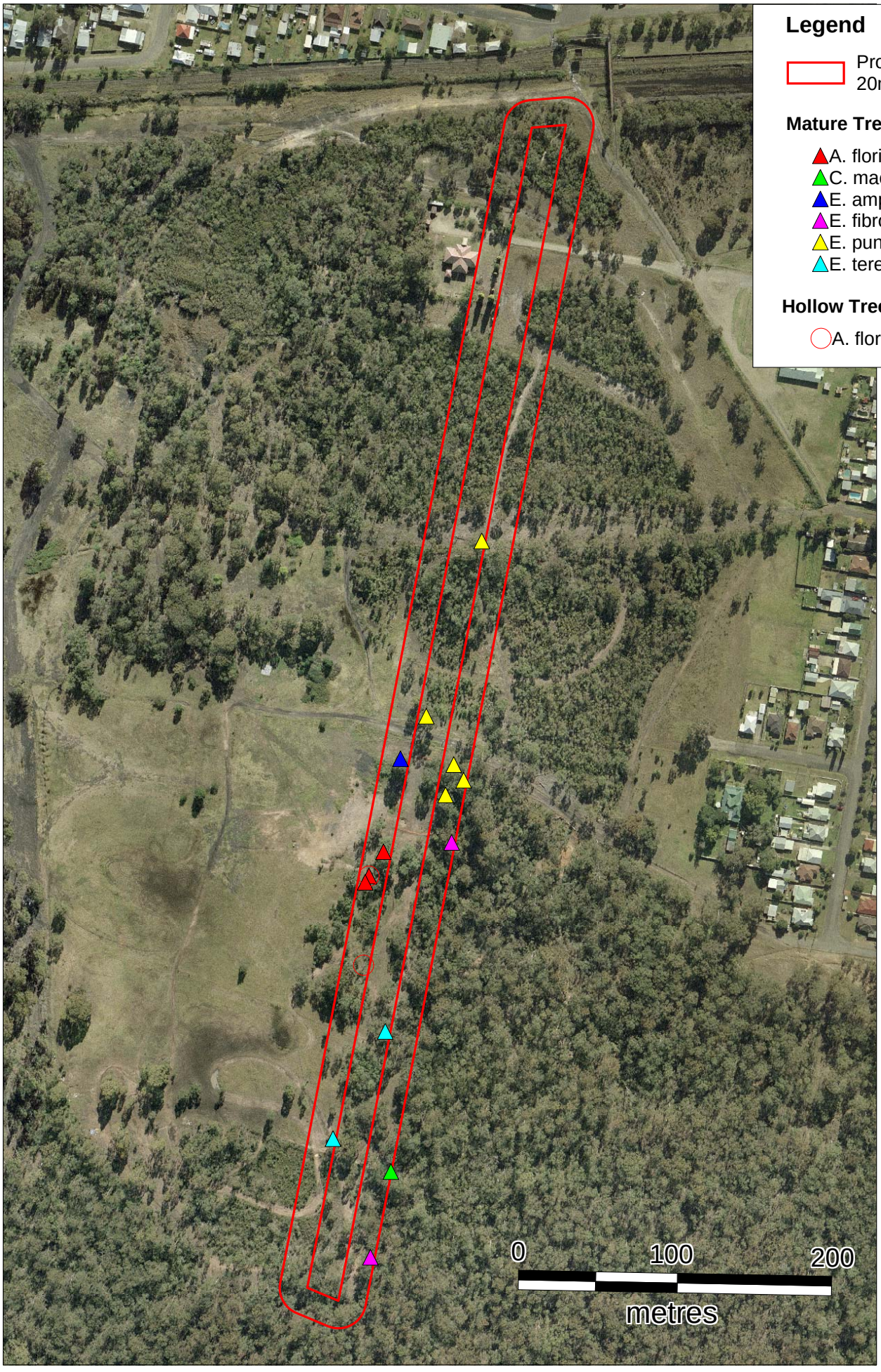

MGA

PROJECT: STATION STREET EXTENSION

CLIENT: HEZ NOMINEES PTY LTD ATF THE HEZ UNIT TRUST

TITLE: HOLLOW-BEARING & MATURE TREES

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FIGURE: 3-3
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HUNTER ECONOMIC ZONE
Where industry thrives

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Table 3-1 Summary of Key Ecological Impacts from the Proposal

Detail	Removal/Impact	Comments
Area of Site	5.75 hectares 2.07 hectares	This area includes the proposed road and surrounding 20 m buffer. Road corridor designed to utilise existing degraded habitat and partially cleared land to minimise extent of clearing.
Total area of Vegetation to be modified	Approx. 1.3 hectares	This area consists of the road corridor (not including buffer)
Vegetation Types to be modified - Lower Hunter Spotted Gum / Ironbark Forest (LHSGIF) - Kurri Sand Swamp Woodland	0.41 hectare (road only) 0.89 hectares (road only) Remainder is existing cleared area.	0.64 hectare (Includes road and buffer) 3.58 hectares (Includes road and buffer) Remainder is existing cleared area.
Hollow bearing Trees to be Affected - Total Hollow-bearing trees - Small-sized Hollows - Medium-sized Hollows - Large-sized Hollows Total Number of Hollows to be affected	2 1 1 1 3	Total number of hollow-bearing trees Entrance Diameter 2 – 10cm Entrance Diameter 11 – 20cm Entrance Diameter >20cm Note: these are not actually located within the proposed road, but are in close proximity
Keystone Mature Trees to be Affected - Total Mature Trees - *Angophora floribunda* - *Corymbia maculata* - *Eucalyptus amplifolia* - *Eucalyptus tereticornis* - *Eucalyptus punctata* - *Eucalyptus fibrosa*	14 (3) 3 (0) 1 (0) 1 (0) 2 (1) 5 (2) 2 (0)	Note: Trees in brackets definitely require removal. Others likely to be retained in buffer.
Threatened Flora Species to be Affected - *Callistemon linearifolius* - *Eucalyptus parramattensis subsp decadens* - *Eucalyptus glaucina*	1 (0) individual 115 (47) individuals 3 (0) individuals	Note: Plants in brackets definitely require removal. Others likely to be retained in buffer.
Rare Flora Species to be Removed - *Grevillea montana* - *Macrozamia flexuosa* - *Eucalyptus sp aff agglomerata*	Approx. 1.14 ha of occupied habitat Approx. 1.39 ha of occupied habitat Approx. 4 known locations	Occurs in Low to Moderate densities Occurs in moderate densities All outside of area to be affected directly by road, within 20 metre buffer

Detail	Removal/Impact	Comments
Threatened Fauna Species to be Impacted Upon At least 26 species have the potential to be impacted upon. Species recorded in the immediate vicinity of the road include: Black-chinned Honeyeater, Powerful Owl, and Yellow-bellied Glider.	Various	Degree of impact dependent on numerous factors including individual species range, abundance, habitat utilisation etc.
Other Ecological Attributes Allocasuarina sp. Mistletoe sp. Hollow / Fallen Timber Understorey Diversity Understorey Nectar Logging / Firewood Collection Fire History / Impact Erosion / Soil Disturbance Rubbish Dumping Weeds Feral Animals	 Present in sections Present in sections Mainly Low Density Moderate over majority Moderate over majority Moderate Light – Moderate Light – Moderate Light – Moderate Light Light over majority	 High in KSSW High in KSSW High erosion associated with cleared easement Mainly along 4WD tracks Mainly along easement Rabbits

4 ENVIRONMENTAL LEGISLATION ASSESSMENT

The NSW DECC issued a final "Assumed Concurrence for the Hunter Economic Zone (HEZ)" in March 2005 (see Appendix B). This document advises that the consent authority can assume concurrence for permissible development (as per the Local Environment Plan) in accordance with cl. 64 of the *EP&A Regulation 2000*, provided the conditions within Attachment 1 of the concurrence document are met.

4.1 Summary of Potential Ecological Impacts

The ecological impacts from the current proposal are summarised below.

Direct Impacts

The clearing of vegetation associated with the road infrastructure will result in direct impacts such as:

- further fragmentation of habitat and an incremental decline in its quality and extent;
- disruption of wildlife corridors and the creation of impediments / potential barriers to faunal movement and plant dispersal;
- loss of regionally and locally significant vegetation;
- loss of potential and known breeding, roosting and foraging habitat for threatened fauna, particularly large winter-flowering Eucalypts utilised by Swift Parrots and Regent Honeyeaters, and a reduction in their local abundance and distribution;
- potential fauna mortality during vegetation clearance activities; and
- potential impacts on 'downstream' areas resulting from soil disturbance and erosion events.

Indirect Impacts

In the longer term, the development may lead to further degradation of remnant habitat at the site, where management does not occur. Such degradation and the associated loss of threatened species / populations that may result could be due to indirect impacts such as:

- potential changes in the hydrological regime resulting from altered surface flows and groundwater levels;
- deterioration in water quality resulting from stormwater runoff;
- further changes to the 'natural' fire regime;
- increased susceptibility to competition, disease, predation, insect attack and other disturbances due to increased access and a reduction in vegetative cover; and
- cumulative impacts from further development and habitat loss on adjacent lands ultimately serviced by the constructed road.

Impacts of Roads on Wildlife

Bennett (1991) states that there are at least three components of a road reserve that can act as a barrier to the movements of terrestrial fauna, namely the bare road surface, the altered roadside habitat, and the noise, movements, emissions and flashing lights associated with traffic use of the road. On wide roads with high traffic volumes, all three of these components combine to pose a formidable barrier to wildlife.

Road vehicles act as vectors for the transport of organisms, particularly in the spread of plant propagules including seeds. In some cases, pathogens such as cinnamon fungus may be spread in mud and soil attached to vehicles, and animals such as the Cane Toad may be accidentally transported from northern Australia.

Soil erosion from road construction may cause sedimentation in creeklines and wetlands within the catchment. The width of clearance between habitats on either side of roads has been identified as the most important factor inhibiting movement by mammals (Oxley *et al* 1974). Little is known about the impact of vehicle noise on wildlife, although anecdotal evidence indicates that some species become habituated to road noise (Adam 1995).

In cases where road construction requires additional fill, if the material used for fill is chemically different from the substrate at the emplacement site it may be responsible for altering the environment and affecting biodiversity. This is of particular concern in nutrient poor sclerophyll forests, such as those that occur on the site, where run-off and dust from the road may increase the nutrient content (particularly phosphorus) in adjacent vegetation and creeklines (Adam 1995).

Many species of wildlife exploit new habitats or new resources that become available as a result of road construction and traffic use. Bennett (1991) provides a summary of these activities, which include:

- Paved road surfaces and their immediate edges provide a source of grit for birds.
- Grassy roadside vegetation provides a foraging resource for herbivores such as kangaroos and wallabies.
- Invertebrates killed by passing traffic that fall to the road surface provide a source of food for many insectivores.
- The warmth retained in the road surface and openness of road edges creates attractive basking sites for reptiles. Some birds may also use road surfaces to absorb warmth and assist thermoregulation.
- The above mentioned resources and activities that bring wildlife to roads also make them vulnerable to passing traffic and subsequently the carcasses of road-killed animals attracts a number of avian, mammalian and reptilian scavengers.
- The open spaces above roads that pass through forests and the concentration of insects around street lights provide new flight paths and foraging resources for insectivorous bats.
- Poles supporting utility services (eg. Electricity and telephone) that are located along roadsides provide perching sites for raptors and other birds.

For example, roadside strips of Eucalypt woodland in the largely cleared rural areas of Victoria were found to provide valuable supplements to larger remnants of woodland for several threatened species including Squirrel Glider, Brush-tailed Phascogale and Grey-crowned Babbler.

4.2 Threatened Species Assessment

4.2.1 Identification of Subject Species

Twenty-six threatened species and two endangered ecological communities have been identified as occurring on the site or as having at least a moderate probability of being affected by development of the site. As such, seven-part tests for these species / communities have been undertaken under the guidelines of Section 5A of the *Environmental Planning & Assessment Act 1979* (see Appendix A). These species / community include:

Threatened Flora

- *Acacia bynoeana*
- *Callistemon linearifolius*
- *Eucalyptus glaucina*
- *Eucalyptus parramattensis* subsp*. decadens*
- *Grevillea parviflora* subsp*. parviflora*
- *Rutidosis heterogama*

Threatened Fauna

- *Litoria brevipalmata* Green-thighed Frog
- *Calyptorhynchus lathami* Glossy Black-Cockatoo
- *Lathamus discolor* Swift Parrot
- *Neophema pulchella* Turquoise Parrot
- *Ninox strenua* Powerful Owl
- *Tyto novaehollandiae* Masked Owl
- *Chthonicola sagittata* Speckled Warbler
- *Pomatostomus temporalis temporalis* Grey-crowned Babbler
- *Climacteris picumnus* Brown Treecreeper
- *Melithreptus gularis* Black-chinned Honeyeater
- *Xanthomyza phrygia* Regent Honeyeater
- *Stagonopleura guttata* Diamond Firetail
- *Lophoictinia isura* Square-tailed Kite
- *Petaurus australis* Yellow-bellied Glider
- *Petaurus norfolcensis* Squirrel Glider
- *Miniopterus australis* Little Bentwing-bat
- *Miniopterus schreibersii* Eastern Bentwing-bat
- *Mormopterus norfolkensis* East-coast Freetail-bat
- *Falsistrellus tasmaniensis* Eastern Falsistrelle
- *Scoteanax rueppellii* Greater Broad-nosed Bat

Endangered Ecological Communities

- Lower Hunter Spotted Gum – Ironbark Forest
- Kurri Sand Swamp Woodland

4.2.2 Section 5A of the EP&A Act (Seven Part Test) Considerations

The NSW DECC issued an "Assumed Concurrence for the Hunter Economic Zone (HEZ)" in March 2005 (see Appendix B). This document advises that determining authorities can assume concurrence for permissible development (as per the Local Environment Plan) in accordance with cl. 64 of the *Environmental Planning and Assessment Regulation 2000* (*EP&A Regulation 2000*), provided the conditions within Attachment 1 of the concurrence document are met.

Application of Section 5A of the *EP&A Act* (Appendix A – Seven-Part Tests) to the affected species/communities indicated that no significant impacts would be expected as a consequence of the proposal.

4.3 Key Threatening Process (KTP)

The KTP's relevant to this proposal are addressed in detail below. A threatening process is defined in the *TSC Act* as a process that threatens, or could threaten, the survival or evolutionary development of species, populations or ecological community. Something can be a threat if it:

- adversely affects threatened species, populations or ecological communities; or
- could cause species, populations or ecological communities that are not currently threatened to become threatened.

Again, the DECC Assumed Concurrence has adequately assessed all relevant ecological matters, and the proposal does not contravene any specific aspect of the Assumed Concurrence.

KTP's are listed in Schedule 3 of the TSC Act. Those most applicable to the current proposal (both directly and indirectly) would appear to be:

- Clearing of Native Vegetation;
- Removal of dead wood and dead trees;
- Removal of hollow-bearing trees
- Invasion of native plant communities by exotic perennial grasses.
- Alteration to the Natural Flow Regimes of Rivers, Streams, Floodplains & Wetlands
- Infection of Native Plants by *Phytophthora cinnamomi*

Clearing of Native Vegetation

This process is considered the most relevant KTP matter resulting from the proposal. This process can be seen to be applicable to any proposal involving clearing of native vegetation, which encompasses a wide variety of proposed landuse activities.

Key matters as described within the Final Determination of this process that may be at least in part applicable to the proposed development include direct loss of habitat, fragmentation, riparian zone degradation, increased greenhouse gas emissions, increased habitat for

invasive species, loss of leaf litter layer, loss or disruption of ecological function, and changes to soil biota.

The proposed development will result in direct loss of approximately 1.3ha of native vegetation within the road footprint of the site. This area provides habitat resources for a diverse assemblage of flora and fauna species, and including threatened flora species, and potentially including threatened fauna species.

Whilst the area of direct impact can be seen to be relatively minor within the context of the greater HEZ site, it is apparent that the proposed development can be seen to be a contributing factor to the detrimental process of Clearing of Native Vegetation on the threatened species present within the HEZ.

However, in saying this, the broader conservation outcomes achieved in the HEZ rezoning process have been based on conserving representative areas of each habitat unit occurring within the study area. The maintenance of biodiversity was a fundamental aim of this representative area conservation approach.

Removal of Dead Wood and Dead Trees

The site occurs in an area of bushland within the HEZ that is somewhat degraded through previous and ongoing degradation regimes, and therefore critical resources for threatened fauna species including dead wood and dead trees are relatively sparse. The proposal will occur over an area mapped as containing a low density of this habitat resource.

Whilst the construction of the Station street extension would result in the further decline of these resources, it is noted that Schedule 5 of the Habitat Management Strategy (HSO, Ecotone, & CCC 2005) recommends that potential habitat resources such as hollow and fallen timber within development areas be placed into adjacent areas of bushland to improve potential habitat resources within the patches of retained vegetation. Schedule 10 of the HMS also recommends that nest boxes be installed to compensate for the loss of tree hollows.

Removal of hollow-bearing trees

The proposal is likely to contribute to the KTP “Removal of hollow-bearing trees” as a result of removal of native vegetation. No hollow-bearing trees are likely to require removal, although two are located within the 20m buffer and will require protection. Even if removal of these trees was required, such impacts would be considered low scale and represent a small cumulative impact.

Invasion of Native Plant Communities by Exotic Perennial Grasses

Dense monocultures of perennial grasses that develop after invasion threaten local vegetation. This may result in local and regional declines of many native species and communities including threatened species such as *Rutidosis heterogama*, the Speckled Warbler and the Grey-crowned Babbler that have been recorded within the greater study area of the HEZ. Many of the perennial exotic grasses establish following disturbances such as construction works.

Whilst clearing for the construction of the Station Street extension may inadvertently create a disturbed area for many perennial exotic grasses to establish, implementation of control and management measures will help to create an environment within which these exotic perennial grasses do not thrive. Furthermore, the proposal is unlikely to instigate this KTP in

an area that has already shown much evidence of the invasion of perennial grasses from past disturbances.

It is noted that Schedule 7 of the Habitat Management Strategy (HMS) (HSO, Ecotone, & CCC 2005) recommends that a regular weed eradication and control program be established to prevent areas from potential colonisation of introduced and invasive undesirable plant species.

Alteration to the Natural Flow Regimes of Rivers, Streams, Floodplains & Wetlands

As part of the Concept Plan HEZ has prepared a Water Cycle Management Strategy, which will ensure that the potential impacts to creekline environs are minimised through the construction of erosion controls and stormwater detention basins.

Nonetheless, the proposal is likely to cause some changes / impacts to the natural flow regime(s) and some minor impacts to threatened species such as the Green-thighed Frog may be expected.

Infection of Native Plants by *Phytophthora cinnamomi*

Phytophthora cinnamomi is listed as a KTP under the *TSC Act 1995*. *P. cinnamomi* is a water mould (like a fungus) that attacks the roots of susceptible plants, in many cases killing the plants. In some native plant communities, epidemic disease can develop causing the death of large numbers of plants.

P. cinnamomi may spread with the movement of infected soil or plant material by people or animals and may be transported by water percolating through the soil, in creeks or storm runoff. People can also transport the fungus to new areas on dirt adhering to vehicles, items they are carrying or footwear.

Humans have the capacity to spread the fungus long distances and across barriers which sets us apart from the natural mechanisms for spread. There is practically nothing that can be done to control the natural spread of the fungus or to destroy it, in the native plant communities.

The extent and impact of *P. cinnamomi* is difficult to ascertain, particularly due to a lack of literature for the local area. This KTP must therefore be regarded as potentially applicable to this development.

4.4 Assessment under SEPP 44 – 'Koala Habitat Protection'

4.4.1 First Consideration – Is the Land 'Potential Koala Habitat'?

Two species of tree listed in Schedule 2 of the above policy as a 'Koala Feed Tree Species' occurs on the site, namely *Eucalyptus punctata* (Grey Gum) and *Eucalyptus tereticornis* (Forest Red Gum). These trees occur at densities of greater than 15% of the total tree component. Therefore the site qualifies as 'Potential Koala Habitat', and further provisions of the policy apply.

4.4.2 Second Consideration – Is the Land 'Core Koala Habitat'?

Searches were made for any secondary indications of Koalas on the site within those areas determined to be 'Potential Koala Habitat'. Such searches targeted features such as scats or distinctive scratch marks on the trunks of trees. Searches for direct observations of Koalas were also conducted during diurnal and nocturnal surveys. No animals were noted on site

and no secondary evidence of the presence of Koalas could be found. It should also be noted that there are only a handful of isolated records of Koalas from the locality. Therefore the site does not qualify as 'Core Koala Habitat' and no further provisions of this policy apply.

4.5 Environment Protection and Biodiversity Conservation Act 1999

On the advice of the Commonwealth Department of Environment and Water Resources (DEW), the construction and ongoing operation of the entire HEZ estate was assessed as a single 'controlled action' under the provisions of the EP&BC Act, rather than as a series of individual proposals. HEZ was referred under EPBC 2004/1417 and was approved on 28th May 2007.Therefore the current proposal does not be need to be referred to the DEW. The Station Street extension has been approved for construction and has been identified in Schedule 3(b) Infrastructure Lands Traversing Development Lands of the approval.

5 DISCUSSION & RECOMMENDATIONS

Flora, fauna and habitat surveys undertaken within the site and the wider HEZ Study Area as part of the Ecological Constraints Master Plan (ECMP) process have led to the production of this assessment report.

The results of the ECMP data have been utilised to achieve adequate conservation outcomes for all of the threatened species and endangered ecological communities within the HEZ Study Area, which culminated in the Department of the Environment and Climate Change (DECC) issuing an Assumed Concurrence (2005) for the development of the Hunter Economic Zone, in March 2005. This document advises that Council (and determining authorities under Part 5 assessment under the EPA Act) can assume concurrence for permissible development (as per the Local Environment Plan) in accordance with cl. 64 of the *EP&A Regulation 2000*, provided the conditions within Attachment 1 of the concurrence document are met (Appendix B). In regard to Part 5 assessments, Section 112C (Clause 3 - relating to the provisions of 79B) of the EPA Act, is applicable to the Assumed Concurrence (2005).

A total of 28 threatened species and five endangered ecological communities have been recorded within the HEZ LEP Study Area to date. Of these, 26 threatened species and two EEC have been identified as having at least a moderate probability of being affected by the proposal. Application of Section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (Seven Part Tests) to these species/communities indicated that no significant impacts would be expected as a consequence of the proposal.

Nonetheless, some incremental impacts associated with the clearance of additional habitats within the 1(a), 4(h), 5(a), 5(b) and 7(b) lands must also be acknowledged and taken into consideration with the current proposal.

The ecological impacts of the proposal have been minimised through ongoing ecological input and consideration of the ECMP data during the design phases of the road. This resulted in:

- Station Street extension being located in part along land with a prior disturbance history vegetation clearing and weed invasion;

- protection of threatened species populations / habitats with particular reference to *Callistemon linearifolius, Eucalyptus parramattensis subsp decadens,* and *E. glaucina* and the potentially significant species *E. sp aff agglomerata*.

The current proposal will not need to be referred to DEW under the provisions of the EP&BC Act. The Station Street extension has been approved by DEW for construction and has been identified in Schedule 3(b) Infrastructure Lands Traversing Development Lands of the approval.

5.1 Recommendations

To minimise the ecological impacts of the proposal, the following recommendations should also be taken into consideration:

- A Vegetation Clearing Plan should be prepared prior to construction occurring to identify protection measures for important habitats;
- Construction / clearing works should minimise (where possible) removal / slashing of threatened flora species recorded within the site;
- Any opportunities to retain mature / hollow-bearing trees within the proposed road alignment should be taken;
- Pre-construction / clearance surveys should be undertaken by an ecologist, in accordance with the requirements of the HMS, to investigate hollow bearing trees for the presence of threatened fauna; and
- An ecologist should be present during all clearing operations.

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