Tangible Planning Solutions

Planning Proposal

Eagleview Road and Goodsell Street, Minto

May 2016

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Revision No.	Date	Description	Prepared By:	Reviewed by:
V1.	15.02.2016	Draft	M. B. Smith	M. B. Smith
V2.	07.03.2016	1st Amendment	M. B. Smith	M. B. Smith
V3.	10.05.2016	2nd Amendment	M. B. Smith	Clients
Final	30.05.2016	Final	M. B. Smith	Clients

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1.0 INTRODUCTION

This Report represents the formative phase in the development of a Planning Proposal geared towards the rezoning of the land, described and shown below (Figure 2), at Eagleview Road and Goodsell Street, Minto from *E4 Environmental Living* to *R2 Low Density Residential* and introduce a 500m2 minimum subdivision lot size as detailed in Section 4 below.

The Planning Proposal provides an opportunity to improve the supply of housing in the Campbelltown Local Government Area, and more specifically the suburb of Minto.

Development of the site has the potential to offer in the order of 35-40 new lots with an estimated population of 100 people. Importantly, it can also be comparatively self-contained and self-sufficient, with access to a wide range of education, community, recreation and retail and commercial services (and associated local employment) for residents in locality. Adoption of contemporary technologies and design can ensure water quality objectives and other environmental considerations can be readily met.

The landowners are organized and ready to work collaboratively with Campbelltown City Council to review and address the opportunity for an integrated and coordinated approach to this rezoning, so as to facilitate the full potential of this in-fill development opportunity.

1.1 Context

The Planning Proposal relates to land known as:

- Lot 4, DP 539244: 221 Eagleview Road, Minto (R. P. Patene)
- Lot 1, DP 719990: 223 Eagleview Road, Minto (R. R. & E.M. Ackerley)
- Lot 2, DP 719990: 225 Eagleview Road, Minto (S. & S. Russo)
- Lot 100, DP 706378: 227 - 229 Eagleview Road, Minto (D. R. & K.A. Marshall)
- Lot 10, DP 719990: 25 Goodsell Street, Minto (P. Phibbs)
- Lot 11, DP 719990: 27 Goodsell Street, Minto (B. L. & S. J. Gaudiello)

The rezoning is to be effected through the preparation of a Local Environmental Plan (LEP) amendment to Campbelltown Local Environmental Plan (LEP) 2015.

The locational advantages of this in-fill site which is close to the centre of Minto and Campbelltown; existing employment, infrastructure and public transport are expected to make this an attractive and desirable location for residential housing and quality of life objectives.

Development of the subject land for urban purposes will increase the choice and range in housing in Campbelltown City LGA consistent with Council's Strategic Planning document *Campbelltown 2025 – Looking Forward*. This is addressed in detail in this Planning Proposal.

The close proximity of the Hume Highway and Main Southern Rail Line provides the opportunity for a contemporary response to promoting public transport use, and correspondingly can achieve sustainability and efficient transport options.

The owners of the subject lands have recognised these locational attributes, and it is this opportunity that is the genesis of this Planning Proposal for Council's consideration.

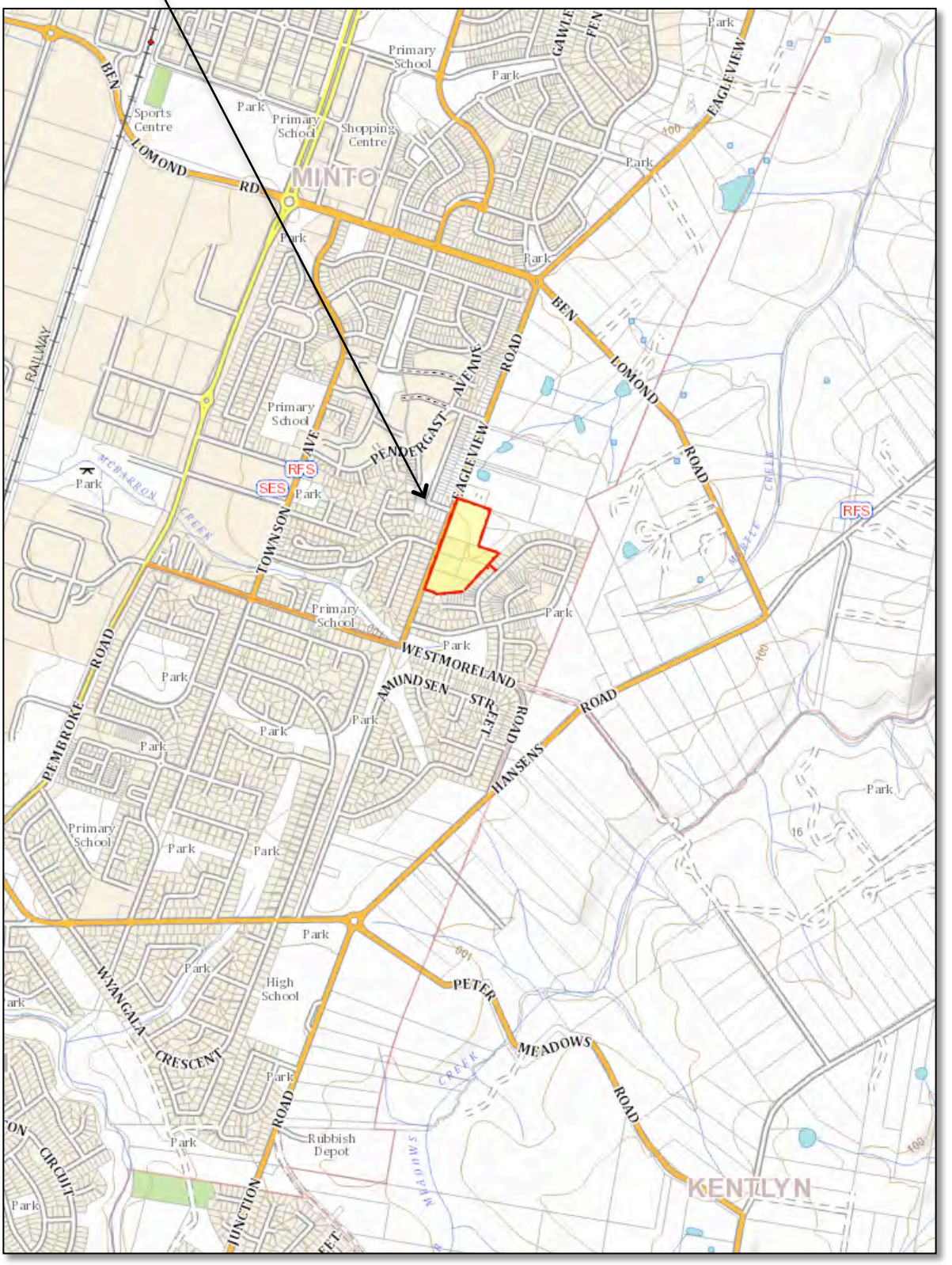

Figure 1: Location Plan *(SIX Maps)*

1.2 Scope of Report

The preparation of a local environmental plan now starts with a Planning Proposal. This Planning Proposal explains the objectives, intended effect of, and justification for the rezoning proposal.

This Planning Proposal has been prepared in accordance with Section 55 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and relevant Department of Planning and Infrastructure Guidelines including *"A Guide to Preparing Local Environmental Plans"* and *"A Guide to Preparing Planning Proposals".*

As outlined in *'A Guide to Preparing Planning Proposals'* the Planning Proposal will evolve throughout the course of preparing the amending LEP as relevant sections will be updated and amended in response to the outcomes of further technical investigations and consultation as necessary.

The 'Guide' requires the Planning Proposal to be provided in four (4) specific parts, being:

- *Part 1 –* A statement of the objectives or intended outcomes of the proposed LEP;
- *Part 2 –* An explanation of the provisions that are to be included in the proposed LEP;
- *Part 3 –* The justification for those objectives, outcomes and provisions and the process for their implementation; and
- *Part 4 -* Details of the community consultation that is to be undertaken on the Planning Proposal. This report confirms that the development will provide a number of benefits for the LGA, including employment opportunities during the construction phase of the roads and infrastructure, including construction of buildings.

This Planning Proposal confirms that the development will provide a number of benefits for the Campbelltown LGA, including short-term employment opportunities during the construction phase of the roads and infrastructure, as well as the construction of dwellings and ancillary buildings.

Longer term, an additional 35-40 new allotments will generate employment prospects in the service industries, as well as encouragement for new families to develop in the region stimulating the local economy and providing full utilisation of existing hard and soft infrastructure.

The justification for the Planning Proposal can also be understood in the context of recent trends towards population growth in the Campbelltown LGA, the demographics of the area and decreasing household size. The need for increased housing provision is reflected in housing targets aspired too by the State Government for supply of appropriate, affordable and connected housing.

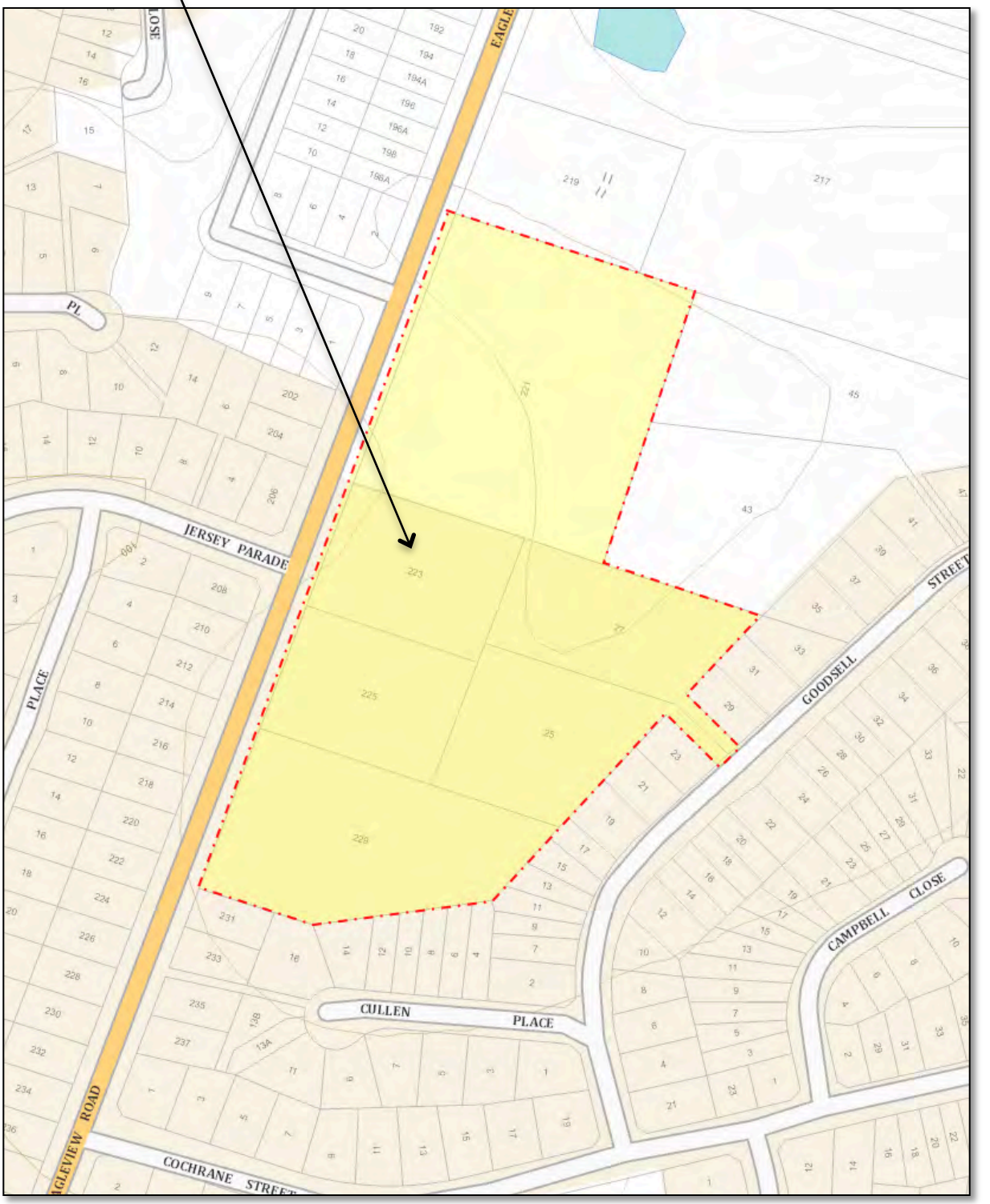

Figure 2: Existing Subdivision Pattern on the surrounding lands

2.0 THE SUBJECT LAND

2.1 Background

The subject land comprises six (6) separate parcels with an overall area of approximately 3.80ha. It has been the focus of numerous discussions and deliberations by Council over many years, and more particularly the last 5 years. The owners have made a number of representations to Council seeking support for a rezoning of the land to permit low-density development commensurate with the character and nature of the surrounding area including, Landcom's One Minto Estate.

In the consideration of these representations, Council has had due regard to a number of significant strategic land use strategies and assessments completed over many years and these have guided and influenced its decision making to date. Whilst these decisions have not been totally supportive of a rezoning, they have greatly informed an overall understanding of the subject lands constraints and opportunities. More particularly, they have assisted in narrowing the focus so that the principal planning issues could be clearly identified and assessed at a fine grain level.

Recent on-going discussions with Council's Environmental Planning Directorate have identified the principal planning issues as being:

- Biodiversity
- Visual landscape
- Traffic
- Infrastructure

This Planning Proposal builds upon the previous body of good work undertaken to date by Council and its consultants at a macro level, by providing a detailed analysis at site specific level of the principal planning issues highlighted above, as well as those relevant in any proposal to develop the subject lands for low density residential housing.

2.2 Context

The suburb of Minto is located within the Campbelltown Local Government Area, approximately 6.6 kilometres north-east of the Campbelltown CBD. For centuries, this area was part of the Dharawal people's country which stretched from the south side of Botany Bay, around Port Hacking to the north of the Shoalhaven River (Nowra) and extending inland west to Campbelltown and Camden. The Dharawal (or Tharwal) lived relatively peacefully until European settlers came upon the region's lush fertile plains in the late 1780's. Pushing out from the newly established colony in Sydney, the new settlers claimed ever-increasing tracts of the land for grazing and pastoralism.

Rich in both indigenous and European history, the area has seen successive waves of development over the last 230 years with its character changing most profoundly since colonial times. The original large land grants have been slowly, but progressively subdivided and the once predominate rural land uses have made way for residential, commercial and pockets of industrial development across the LGA. The unceasing development has resulted in the urbanised landscape visible today and reflects the growth pressures and demands that this important area on the outskirts of metropolitan Sydney is experiencing in the 21st century.

Figure 3: Aerial photograph of the subject land and surrounding development *(Six Maps)*

This small in-fill rezoning proposal is of a relatively minor and insignificant in nature when compared to how the LGA has changed over the last 230 years, however it further reinforces Council's aspirations for sustainable and well planned development to meet the needs of its current and future residents.

Campbelltown 2015 – Looking Forward is a document prepared by Council represents a statement of broad town planning intent. The document notes that the community have said in terms of urban development that:

- *More urban growth can bring better facilities and amenities*
- *Enough or already excessive high rise/medium density housing*
- *Some people believe that there is some capacity for additional housing development – particularly around business centres/railway stations* [1]

The Planning proposal seeks to facilitate planned and coordinated in-fill urban growth at low-density within easy connectivity to existing business centres and the railway station at Minto.

The aerial photograph above provides a contextual overview of the subject area and its relationship with surrounding environs. It can be seen that the land is largely unconstrained for increased urban development in terms of landform, existing vegetation, services and connectivity.

The subject land has a substantial frontage to Eagleview Road to the west and connectivity to Goodsell Street from the east, which facilitate easy access, and allows the lands to be developed in stages.

The subject land is surrounded principally to the south, east and west by urban development comprising *R2 Low Density Residential* zoned land with minimum subdivision lot size of 500m2 and maximum 8.5m height limit. To the north, on the others side of the ridge the land is zoned *E4 Environmental Living* with a minimum subdivision lot size of 4000m2 and maximum 9.0m height limit (the same as the subject lands).

It is noted that the maximum height limit on the subject land (E4) is 0.5m higher than that on the surrounding residential R2 zoned land. This is interesting as one of the main issues limiting previous attempts to rezone the subject land has been visual impact.

2.3 Locational Advantages

This in-fill site offers a number of locational, employment, educational and recreational advantages for future residents. The site:

- Is within the existing well established residential suburb of Minto;
- Is identified as part of the wider Campbelltown LGA's area capable of accommodating some of the planned growth for the region;
- It is encircled by existing urban development, which has substantial public and private investment in infrastructure, facilities, employment and services;
- Is conveniently located within a short distance to existing major transport nodes (rail 1.7klms and the Hume Motorway 2.7klms);
- Is located 1.2klms south of the locally well serviced Minto Mall Shopping and 4klms from the regionally significant Campbelltown Mall and Macarthur Square Shopping Centres;
- Is within easy access to the an array of educational establishes including pre-schools

[1] Campbelltown 2015 – Looking Forward, Page 4

(1.4klms), primary schools (310m), secondary schools (1.2klms), TAFE and the University of Western Sydney (6klms);

- Is surrounded by a number of active and passive recreation and open space facilities;
- Enjoys connectivity to the required range of essential infrastructure services including electricity, water, sewer, gas, and data. These services can be delivered effectively and sustainably to the site, offering low cost development and competitively priced housing that can achieve housing affordability objectives; and
- Provides additional supply of land and housing reinforcing a competitive sales environment, and improving supply and choice for households in the Campbelltown LGA.

The in-fill rezoning of this site to low density residential will offer important lifestyle, employment and economic opportunities to reinforce the viability and role of the existing facilities and services in the surrounding suburb of Minto and the wider Campbelltown LGA.

2.4 Topography & Drainage

The sites topography generally falls in a north-to-south direction, and is characterised by a small ridge running parallel to Eagleview Road that results in the lots accessed off Goodsell Street falling in a west-to-east direction, whilst the topography of the properties facing Eagleview Road fall in a east–to-west direction.

The northern extremity of the proposed rezoning lands (on Lot 4, DP 539244) corresponds with a top of a small rise. The topography of the adjoining parcel directly abutting further to north (Lot 2, DP 536773) falls away in a northerly direction and this boundary between the two lots forms a distinct separation (visually and environmentally) between two small catchments.

2.5 Geology

The Geological Map of Wollongong – Port Hacking (Geological Series Sheet 9029-9129, Scale 1:100,000, 1985) indicates the site's geological profile comprises Ashfield Shale.

This landscape coupled with the prevailing topography and drainage regime generally poses few challenges for future urban in-fill development. The adoption of appropriate construction and soil/water management techniques with increased densities on the subject lands can ensure sustainable land development outcomes and a healthy catchment.

2.6 Ecology

The site was originally cleared in the early to mid 1800's to facilitate its use for grazing and pastoralism. A gradual but steady succession of subdivisions has fragmented the land into increasingly smaller parcels over the last 200 years and this has resulted in the locally endemic biodiversity of the region being highly degraded. In terms of the subject site itself, a preliminary flora and fauna assessment has been undertaken which reveals that land now predominately comprise highly modified grasslands, domestic gardens and landscaping characterised largely by exotic species.

Woodlands Environmental Management undertook the preliminary assessment and a copy is attached as Annexure 1. The assessment concluded:

1. *No endangered or threatened ecological communities listed under the Threatened Species Conservation Act 1995 or the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 are recorded as being present at the subject land.*
2. *The presence of any Endangered Ecological Communities within the subject land is considered highly unlikely due to the nature and extent of clearing and modification of the vegetation, and ongoing land use.*
3. *The presence of any threatened species of flora within the subject land is considered highly unlikely due to the nature and extent of clearing and modification of the vegetation, and ongoing land use.*
4. *No vegetation types or communities listed as 'over cleared vegetation types' i.e. over 70% cleared within the Sydney Metro CMA are recorded as being present at the subject land.*
5. *The proposed subdivision of the subject land into 500m2* allotments is likely to result in the clearing and disturbance of land presently classified as 'Highly disturbed areas with no or limited native vegetation' and dominated by weeds and exotic species. Impacts on native flora are therefore likely to be negligible.*
6. *No Threatened Species of fauna have been recorded within the subject land on the Atlas of NSW Wildlife. Species recorded within the locality have been located within areas of intact vegetation or of a significantly higher condition than that of the subject land.*
7. *The presence of any threatened species of fauna within the subject land is considered highly unlikely due to the nature and extent of clearing and modification of the habitat, and ongoing land use.*
8. *The proposed subdivision of the subject land into 500m2* allotments is likely to result in the clearing and disturbance of land presently classified as 'Highly disturbed areas with no or limited native vegetation' and supporting little significant habitat for native species. Impacts on native fauna are therefore likely to be negligible.*

* It is noted that the minimum allotment size proposed is 500m2 (and not 500m2)

2.7 Visual Landscape

The visual landscape attributes of the subject land have been assessed and reported to government, including Council on a number of occasions over the last 30 - 40 years. The State Government originally identified the Campbelltown – Macarthur region in late 1960 and early 1970's as suitable to accommodate an additional 250,000 dwellings to meet forecasted growth pressures in the Sydney basin at the time. In 1987, Council commissioned an environmental study to examine the scenic protection areas west of the then Georges River Parkway corridor. Both these critical planning studies did not identify the subject lands as being of visual landscape merit.

From the early 1990's through to 2010, a series of local environmental studies were completed underpinning numerous statutory amendments undertaken to the prevailing landuse planning instruments that facilitated the recommendations of earlier strategic planning studies. This included the rezoning of much of land previously identified as suitable for urban expansion, incorporating the areas surrounding the subject lands.

In 2011, Council engaged Paul Davies Pty Ltd in association with Geoffrey Britton (Environmental Design Consultant) to embark on a visual analysis of the areas known as the *Scenic Hills and East Edge Scenic Protection Lands*. The Analysis included the subject lands, which it described as being "a large landscape unit that demonstrates a rich diversity of scenic landscape character" and contains "significant stands of native vegetation of high and medium conservation value". In the

subsequent covering report to Council on the outcomes and recommendations of the Analysis, it was advised "some parts of this unit (E-LU4) may have the capacity to accommodate some limited increase in the density of development".

A number of recent zone amendments have followed with large subdivision developments now under construction either in close proximity or directly adjacent to the subject lands. These include most notably Landcom's *One Minto Estate* comprising over 1150 dwellings.

A view of the immediate Minto area today displays a significantly different picture to that which Davies and Britton assessed 5 years ago. The landscape as broadly described in their 2011 study has been largely modified and the assumptions underpinning it are now in need of review.

To ascertain a thorough understanding of the values and attributes of the subject lands, a fresh detailed landscape and visual analysis has been undertaken by HLS Pty Ltd. This site specific evaluation is the most comprehensive examination as completed to date of the subject lands including meticulous fieldwork, and was based on four main considerations, being:

- *The existing visual landscape*
- *The significance of the existing visual landscape*
- *The visual usage of the affected areas*
- *The visual effect of the development*

As part of this new Analysis, a complete literature review was also undertaken so to understand previous drivers relating to recommendations and decisions that have shaped recent developments in the area. A copy of the new Analysis is attached as Annexure 2 to this Planning Proposal.

The Analysis has noted that today "the site is surrounded by suburban development on three sides. The ridgeline in this location has been severely compromised by the development of the houses on the ridge top within the Minto Renewal area, immediately to the west across Eagleview Road.

The site is enclosed by landform and surrounded by suburban development of low visual quality". It further noted that the "site's contribution to the landscape character of the locality is limited in extent to the immediate section of Eagleview Road fronting it. It provides an improved visual character to the adjacent suburban areas, with some parkland character. It is suburban rather than rural".

In summary, this detailed analysis has found that the issues identified as part of the broad scale approach undertaken in earlier assessments including by Britton and Davies, as well as Conacher Travis cannot been sustained when the subject land and its immediate environs are examined in fine grain. The Assessment also notes that the existing visual landscape could be significantly improved if appropriate controls were now included guiding the development of an integrated subdivision layout for the subject land.

2.8 Bushfire Hazard

The site is not identified as bushfire prone land on the Campbelltown City Council LGA – Bush Fire Prone Land Map (5/6/2014).

2.9 Noise

There are no developments adjoining or in close proximity to the subject land that would generate adverse noise and vibration impacts for future residents on the land.

2.10 Site contamination

An investigation of the previous uses that have been undertaken on the subject site has revealed that historically, the land has been used predominantly for rural based purposes. These included broad acres grazing, farming, market gardens, and housing one shed belonging to a small poultry farm that was established in the early 1960's on the adjoining land to the east.

The poultry farm was closed in the mid 1970's and all the associated buildings, including its three laying sheds, associated feed storage areas and the processing facility subsequently removed. The land upon which the farm was predominantly located was then subdivided for low-density residential housing. This housing is accessed from Cochrane Street and includes all the land directly to the east of the subject site.

In the 1980's the remaining fragments of the once larger rural property fronting Eagleview Road was cleared of all remnant vegetation and subdivided by creating a large lot residential allotments. Since then, each of the allotments within the estate has been developed and today each contains a substantial dwelling-house with associated garages, sheds, swimming pools and landscaped gardens.

The research findings to date indicate there has been no previous land uses undertaken on the subject lands that has entails any potentially contaminating activities.

2.11 Heritage

The subject lands do not encompass items that are listed as of local, State or National cultural heritage significance. There are also no directly adjoining lands or lands within immediate proximity that contain items of cultural heritage significance, and the subject land is not within a defined Conservation Area pursuant to the provisions of Campbelltown LEP 2015. (Schedule 5 and Heritage Map – Sheet HER-008).

A search of AHIMS has revealed that there are no places or items of indigenous heritage and/or archaeology on the subject land or on adjoining lands. The subject lands are not identified on Campbelltown's City Council Local Government Area Zones of Aboriginal Archaeological Sensitivity Map (2/1/2007).

The following is a summary of the results of the various heritage registers and listings searches in relation to the study area.

✓ Register of the National Estate	There are no items within the study area listed on the Register of National Estate.
✓ National Heritage List	There are no items within the study area listed on the National Heritage List.

✓ Commonwealth Heritage List	There are no items within the study area listed on the Commonwealth Heritage List.
✓ Department of Environment & ✓ Conservation (DEC) AHIMS	There are no Aboriginal places and/or objects are registered with AHIMS as being located within close the vicinity of the study area. No registered sites are situated within the actual study area.
✓ National Native Title Tribunal	There are no claims on the study area registered with the National Native Title Tribunal.
✓ NSW State Heritage Register	There are no items within the study area listed on the NSW State Heritage Register.
✓ Snowy River Local Environmental Plan 2014	There are no items within the study area listed on the Snowy River Shire Council LEP.
✓ National Trust of Australia (NSW)	There are no items within the study area listed on the National Trust Register.

2.12 Mineral Resources

The subject land contains no known deposits of mineral resources and is not located directly adjoining identified resources or existing extractive industries.

2.13 Flood Planning

The subject land is not identified as being flood prone land. However, due to the lands favourable topography, geology and overall size appropriate management practices including WSUD can be easily facilitated with all new future development to minimise potential adverse impacts associated with increased urban run-off.

2.14 Traffic and Access

The subject land can be readily accessed from Eagleview Road to the west, and Goodsell Street to the east. Both thoroughfares are public roads, bitumen sealed, illuminated and appropriately line marked and signposted. Their current design and condition reflects their usage as local roads.

A preliminary traffic assessment has been undertaken by *Intersect Traffic* to determine the likely traffic impacts of the proposal on the surrounding road network and associated roadside infrastructure. A copy of the Assessment is attached as Annexure 3 to this Planning Proposal.

The Assessment conclude that:

- *The existing local road network has sufficient spare capacity to cater for the planning proposal.*
- *The additional traffic generated by the proposal is less than 10 % of existing traffic volumes therefore it is reasonable to conclude that on its own such an insignificant traffic increase would not adversely impact on the wider road network.*

- *The addition of up to 28 vtph on any section of the local road network would not be expected to adversely impact on the operation of adjoining intersections particularly as the additional traffic on these intersections will decrease markedly as traffic on the road network is distributed through the various travel routes to the site and represents less than 10 % of total traffic volumes through the intersections.*
- *With proposed lot sizes well in excess of the minimum 450 m^2 for low density residential being sought in the planning proposal it is considered this is large enough to allow on-site car parking to be provided on each lot in accordance with Campbelltown City Council's DCP requirements for at least a single dwelling house.*
- *The proposal has the potential to increase public transport usage. However, the scale of the development is relatively small therefore the increased public transport usage and alternate transport mode traffic increase is not likely to be significant. Therefore, improvements to infrastructure and public transport services are unlikely to be warranted.*
- *There are bus stops with shelters and seats located immediately south of the site that is within convenient walking distance to the site and being within 450 metres of the extremities of the site.*
- *The additional pedestrian demand from the development would not be expected to be such that it will require construction of new pedestrian footpaths in the area aside from the current requirements of Campbelltown City Council in regard to the site frontages.*
- *Cyclists in the vicinity of the site are generally required to utilise the sealed shoulders or share travel lanes on all the local roads in the vicinity of the site. Again this is considered suitable for the level of additional demand generated by the proposal.*

The Assessment also recommended that from a traffic perspective, the proposed in-fill rezoning could be supported as it is considered it would not adversely impact on the local road network and could meet all the requirements of Campbelltown City Council, RMS and Australian Standards.

2.15 Physical Infrastructure

The suburb of Minto is serviced by reticulated electricity, gas, sewerage and a town water supply. Preliminary enquiries and investigations indicate that this infrastructure is of a sufficient capacity and design to accommodate the likely increased demand associated with future urbanisation of the subject land. However, more detailed investigations will be required following a positive Gateway Determination should the preliminary Planning Proposal progress.

In terms of the provision of water and sewer services, an assessment by Australian Water Project Management Pty Ltd has confirmed that the proposed rezoning can be serviced by existing Sydney Water infrastructure. A copy of their review is attached as Annexure 4 to this Planning Proposal.

The design and implementation of a sustainable stormwater management system for this in-fill site, based on the principles of Water Sensitive Urban Design (WSUD), can be easily undertaken. However, successful implementation requires:

- A thorough understanding the characteristics of a site including the principles of sustainable and integrated management of land and water resources, and incorporating best practice stormwater management, water conservation/reuse and environmental protection. This requires developing an in-depth understanding of site geology, hydrology, ecology and environmental conditions; and
- An integrated and collaborative design approach.

Whilst this is a matter for detailed analysis and design at a future subdivision design stage, it is considered that due to the site's prevailing geology, hydrology, ecology and environmental conditions there is scope for future development to reconnect the natural environment to the built environment, through successfully proven environmental engineering techniques. These include:

- The protection of water quality of the catchment by improving the quality of water draining from the subject land to waterways;
- The reduction in runoff and peak flows through the provision onsite of local detention measures which can reduce the infrastructure required downstream to effectively drain the subject land during rainfall events and reduce scour in natural creek systems;
- The minimisation of water consumption, encouragement of reuse and diversification of water supply sources which will ease pressure on potable mains supply;
- Maximise the visual and recreational amenity of a development; and
- The addition of green infrastructure in the streetscape that can have a cooling effect and help buffer the health impacts of heat waves and urban heat island effect.

The connection of the subject lands to Council's existing stormwater infrastructure will not necessitate the creation of any easements or works over private lands not associated with the proposal.

Preliminary investigations indicate that the estimated electrical demand arising from an urbanisation of the subject land can be accommodated within the existing network system. A new main from the existing substations would need funded by the developer. Servicing in this context is merely a case of meeting the relevant charges with the preferred supplier.

Minto is currently serviced with adequate telecommunications infrastructure, including the 4G Network with sufficient capacity to service further urban development on the site.

In summary, the subject land can be economically serviced. The required physical infrastructure currently servicing Minto has the spare capacity to meet the likely demands of this low-density in-fill proposal. Some enhancement and amplification of existing systems will be required, and these will need to be funded by the developer.

2.16 Community Infrastructure

The total allotment yield for this proposed in-fill rezoning is estimated at 35-40 new lots with a consequential increase in population of 100 people. It is considered that the likely additional demand on social services and recreational infrastructure arising from this population increase could be comfortably accommodated within the existing services and facilities in Minto itself, as well as surrounding suburbs. This includes important community infrastructure such as schools, active and passive open space, cycleways, places or worship, community centres, social clubs and the like.

2.17 Mine Subsidence

The site is not located within a Mine Subsidence District.

3.0 EXISTING PLANNING CONTROLS

3.1 Current Zoning

The subject land is currently zoned '*E4 – Environmental Living'* under the provisions of Campbelltown Local Environmental Plan (CLEP) 2015. The objectives of the current zone are:

- *To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values.*
- *To ensure that residential development does not have an adverse effect on those values.*
- *To conserve the rural and bushland character of land that forms the scenic eastern edge of Campbelltown's urban area.*
- *To protect and enhance areas of scenic value and the visual amenity of prominent ridgelines.*
- *To maintain significant stands of native vegetation and wildlife and riparian corridors.*
- *To ensure the preservation and maintenance of environmentally significant and environmentally sensitive land.*

Land directly adjoining to the north is also currently zoned E4. However, land directly contiguous to the south, east and west is currently zoned *'R2 Low density Residential'*. As such, the development site is largely surrounded by urbanisation and the proposal can be considered a logical, practical and efficient in-fill development response.

3.2 Development Control Plans

The land is subject to the provisions of *'Campbelltown (Sustainable City) Development Control Plan 2014'*, which aligns and supports the CMLEP 2015 in providing more detailed controls and guidelines, including:

- The overarching objectives for development generally, and specific issues;
- General development controls which relate to most forms of development – such as vehicular access and parking requirements, landscaping, and tree and vegetation preservation;
- Principal development controls for development;
- Controls for special development types; and
- Site-specific development controls for particular areas within the LGA, such as the suburb of Minto.

The residential development controls in the DCP will not need to be amended as a result of this Planning Proposal. Further, it is considered that future development on the subject site, and any individual allotment can be undertaken to meet with the overarching objectives and specific numerical controls of this important document.

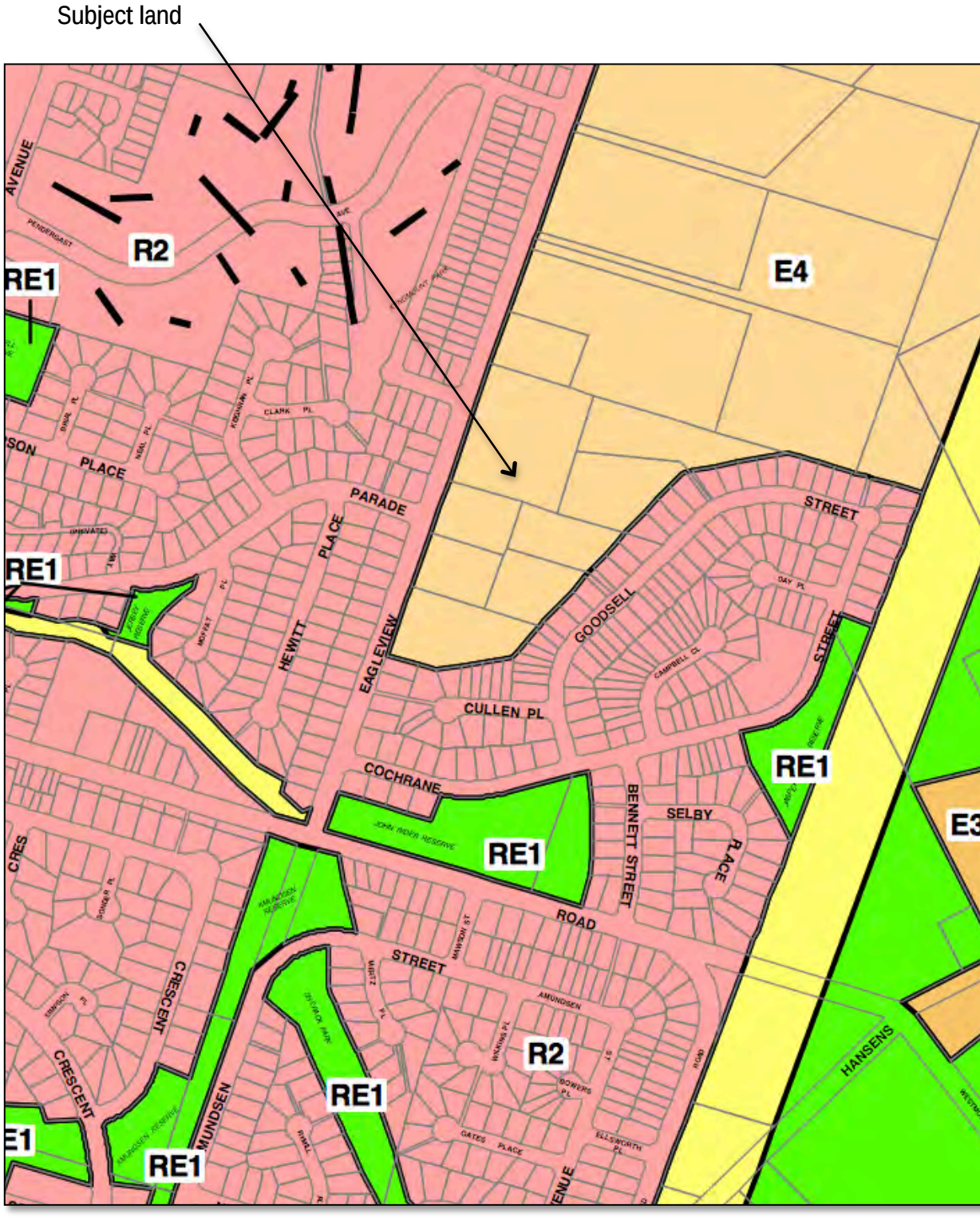

Figure 4: Existing Zoning Map extract from CLEP 2015.

4.0 INTENT AND PROVISIONS (Parts 1 & 2)

4.1 Part 1 – Objectives and Intended outcomes

This Planning Proposal has the express purpose of facilitating low-density residential development with a minimum allotment size of 500m2 on the subject lands.

The subject lands include:

▪ Lot 100, DP 706378	-	220 Eagleview Road, Minto	7525m2 approx.
▪ Lot 4, DP 539244	-	221 Eagleview Road, Minto	13000m2 approx.
▪ Lot 1, DP 719990	-	223 Eagleview Road, Minto	4175m2 approx.
▪ Lot 2, DP 719990	-	225 Eagleview Road, Minto	4130m2 approx.
▪ Lot 10, DP 719990	-	25 Goodsell Street, Minto	4640m2 approx.
▪ Lot 11, DP 719990	-	27 Goodsell Street, Minto	4585m2 approx.
Total			3.81ha approx.

The objective of the Planning Proposal is to:

> *To facilitate planned and sustainable approach to increased low-density urban development on the lands in accordance with its environmental capacity and existing services and infrastructure.*

The intended outcome of the Planning Proposal is a coordinated and integrated approach to in-fill development on the subject land commensurate with its natural constraints and development opportunities.

4.2 Part 2 – Explanation of Provisions

The intended outcome is to be achieved by:

a) Amending the Land Zoning Map in accordance with the proposed zoning map shown at Annexure 5, which will change the zoning of the site from *E4 Environmental Living* to *R2 Low Density Residential*; and

b) Amending the Minimum Lot Size Map in accordance with the proposed minimum lot size map shown at Annexure 6, which indicates a minimum lot size of 500m2 on the site.

5.0 JUSTIFICATION (Part 3)

5.1 Introduction

This overview establishes the case for the zoning change proposed in the LEP amendment. It should be noted that the level of justification is commensurate with the impact of the rezoning proposal and an acknowledgement of the need for possible future preparation of specific studies required by the Gateway Determination.

The rezoning of the land to *R2 Low Density Residential* via this Planning Proposal will enable:

a) The facilitation of a planned and integrated approach to in-fill development within the existing suburb of Minto;
b) An increase in housing choice, diversity in an established location that respond to the needs of Minto community;
c) A sustainable and coordinated expansion of local short and long-term employment opportunities;
d) Elements of the natural systems being respected, conserved and enhanced;
e) Existing physical and community infrastructure being utilized and embellished;
f) A framework established for more detailed planning; and
g) The growth and development objectives of CLEP 2015 and Campbelltown's Community Strategic Plan 2013 - 2023 being enhanced.

5.2 Need for the Planning Proposal

5.2.1 Is the Planning Proposal a result of any strategic study or report?

This Planning Proposal is not the result of any strategic study or report commissioned by Council or any other government entity. It is based on a rezoning application lodged by the proponents to rezone the site. However, it is based on sound town planning principals; advice and direction of Campbelltown City Council; and by evidenced based research.

5.2.2 Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

Yes. The current *E4 Environmental Living* zone permits subdivision with a minimum lot size of 4000m2.

The proposed rezoning to *R2 Low Density Residential* represents the most logical way of achieving the intended objective and outcomes, as there is no appropriate alternative under the prevailing legislation.

The proposed *R2 Low Density Residential* zoning will achieve a modest, but efficient utilisation of the land resource and provide opportunities for future residential development with minimal environmental impacts. It will provide opportunity for flexibility and diversity in housing choice.

5.3 Relationship to Strategic Planning Framework

5.3.1 Is the Planning Proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy?

The planning proposal is generally consistent with the relevant objectives and actions contained within the following Strategic Plans:

New South Wales 2021: A Plan To Make NSW Number One

NSW 2021: A Plan to Make NSW Number One is a long-term plan to deliver services in NSW, which sets clear priorities to guide government decision-making and resource allocation.

NSW 2021 is based around five broad strategies:

- To rebuild the economy;
- Provide quality services;
- Renovate infrastructure;
- Restore government accountability; and
- Strengthen our local environment and communities.

The rezoning of the site for low-density residential housing is consistent with the Plan and its strategies in that it will contribute in a small but important way to the aim of improving housing affordability and availability, and assist in facilitating the greater goal of delivering 25,000 new dwellings per year across NSW.

Draft Metropolitan Strategy for Sydney to 2031

The draft Metropolitan Strategy for Sydney 2031 was publicly exhibited until 31 May 2013 and sets the framework for Sydney's growth and prosperity to 2031 and beyond. It has a strong focus on boosting housing and jobs growth, and includes targets and actions to facilitate investment and growth in NSW.

The draft 2031 Strategy anticipates that Sydney's population will grow by 1.3 million people by that time taking the total population to 5.6 million. Notably the number of people over the age of 65 will be double that at present, and there will be more than one million people under 15 years of age. Relevantly, Greater Western Sydney will be home to more than half of Sydney's population.

To drive sustainable growth, the draft Strategy is built around five key outcomes for Sydney including:

- Balanced growth;
- A liveable city;
- Productivity and prosperity;
- A healthy and resilient environment; and
- Accessibility and connectivity.

The draft Strategy sets employment and housing targets across six sub-regions, and new housing is encouraged in areas close to existing and planned infrastructure in both in-fill and greenfield sites.

The Campbelltown LGA, in which the suburb of Minto is situated, is classified as part of the South West Sub-region and Campbelltown–Macarthur is a major centre under this plan servicing the South West Sub-region. More specifically, the Campbelltown-Macarthur Major Centre will continue as the regional focus for office, retail, entertainment, cultural, public administration and services developments, and is projected to provide capacity for at least an additional 10,000 jobs until 2031.

This Planning Proposal is consistent with, and directly supports, the strategic objectives of the draft Metropolitan Strategy.

The Metropolitan Plan for Sydney 2036

This Planning Proposal is generally consistent with the Sydney Metropolitan Strategy. For the purposes of this Proposal, the relevant strategic directions and objectives from the current metropolitan strategy have been listed below:

- Strategic Direction D – Housing Sydney's Population

This strategic direction seeks to ensure that Sydney is able to house its growing population. Potentially, this will result in urban sprawl that puts pressure on rural and 'fringe' land.

Relevant Objective: *D1 – To ensure an adequate supply of land and sites for residential development.*

- Strategic Direction F – Balancing Land Uses on the City Fringe

This strategic direction deals with managing land uses on the fringe of Sydney. The objectives of Strategic Direction F are as follows:

Relevant Objective: *F1 – To contain Sydney's urban footprint*

This will be achieved by focussing land release in Growth Centres including in-fill development and simplifying the land release process. Further, this objective seeks to focus growth on in-fill sites and in existing serviced locations.

A Plan for Growing Sydney (2014)

The purpose of this Plan is to provide a framework that will guide land use planning decisions for the next 20 years. Its aims are to strengthen the global competitiveness of Sydney; deliver strong investment and jobs growth in Western Sydney; and provide additional housing that will be located close to jobs, public transport, community facilities and services.

The Plan outlines four broad Goals and a number of associated directions. In terms of this particular Planning Proposal, the following Goals and Directions are of relevance:

- *Goal 2: A city of housing choice, with homes that meet our needs and lifestyles*

Direction 2.1: Accelerate housing supply across Sydney
Direction 2.2: Accelerate urban renewal across Sydney – providing homes closer to jobs
Direction 2.3: Improve housing choice to suit different needs and lifestyles
Direction 2.4: Deliver timely and well-planned greenfield precincts and housing

- *Goal 3: A great place to live with communities that are strong, healthy and well connected*

  Direction 3.1: Revitalise existing suburbs
  Direction 3.3: Create healthy built environments

- *Goal 4: A sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources*

  Direction 4.1: Protect our natural environment and biodiversity
  Direction 4.3: Manage the impacts of development on the environment

The Planning Proposal seeks to enable the development of an additional 35-40 in-fill residential allotments in the established suburb of Minto. The proposal is considered to be consistent with the identified goals and specific directions of the Plan.

Draft South West Subregional Strategy (2007)

The NSW Department of Planning's South West Sub-regional Strategy is the strategic land use planning framework to guide the sustainable growth of South West Sydney over the next 25 years.

One of the key directions within the strategy is to accommodate a high proportion of additional dwellings within the existing urban areas in order to protect native bushland areas and rural and resource lands from encroaching urban development.

The Strategy also proclaims that working land should not be considered as land for urban development as the protection of these resource lands is not only vitally important to the Sydney fresh produce markets, the construction market and secondary industries such as steelworks and other manufacturers, but also to tourism, biodiversity and catchment protection. It is essential that businesses and individuals involved in these industries have greater certainty for investment timeframes on the future uses of these lands.

Careful consideration should be given to the potential impact of access to these resources before commitments are made to development in the South West Sub-region.

It is considered that the Planning Proposal is consistent with, and directly supports, the strategic objectives of the Strategy in relation to boosting housing supply, and indirectly in facilitating jobs growth in the South West Sub-region.

5.3.2 Is the Planning Proposal consistent with the local council's community strategic plan or other local strategic plan?

This Planning Proposal is not inconsistent with the intended outcomes and actions of all applicable Council strategic plans. These strategic plans include:

Campbelltown Community Strategic Plan 2013-2023

The Campbelltown Community Strategic Plan defines a sustainable vision for the local government area and sets out five key themes and goals that Council will follow to achieve the needs of the community over the next 20 years. The five key strategic themes and goals are:

- A sustainable environment
- A strong local economy
- An accessible City
- A safe, healthy and connected community
- Responsible leadership

Each theme is supported by a series of associated strategies forming the actions that will deliver progress over the next 20 years towards successful completion.

The proposal is not inconsistent with relevant provisions of the Plan, and in particular Objectives 1, 2, 3 and 4, and the numerous supporting strategies and actions.

Campbelltown 2025 Looking Forward (2004)

Campbelltown 2025 Looking Forward describes its purpose as being "a statement of broad town planning intent for the longer term future of the City of Campbelltown that:

- Responds to what the Council understands people want the City of Campbelltown to look, feel and function like;
- Recognises likely future government policies and social and economic trends; and
- Sets down the foundations for new town plan, that will help achieve that future".

The preparation of the Strategy is underpinned by extensive community consultation and engagement focussing on the community's perception and aspirations. This Planning Proposal meets many of these expressions, including:

- *The special environmental character of Campbelltown*
- *Affordable housing*
- *Opportunities for a range of lifestyle opportunities (natural, semi-rural, village, suburban, & urban)*
- *More urban growth can bring better facilities and amenities*
- *Additional housing development – particularly around business centres/railway stations*
- *Not enough local employment opportunities*
- *Strengthening community relationships – liveable neighbourhoods*

The Strategy also adopted six strategic directions as a structure that is to pilot all future land use planning instruments.

The Planning Proposal is entirely consistent with the intent and desired outcomes of the Strategy.

5.3.3 Is the Planning Proposal consistent with applicable State Environmental Planning Policies?

The lands are subject to the provisions of a raft of State Environmental Planning Policies (SEPP). The subject policies are noted in Table 1 below and importantly do not prohibit and/or significantly constrain the Planning Proposal.

TABLE 1: Applicable State Policies

State Policies	Response
State Environmental Planning Policy No 55 – Remediation of Land	Yes - An initial investigation reveals that the subject land has not been used for a potentially contaminating purposes or activities in the past. Previous uses have been grazing, animal agistment, poultry farming and large lot residential.
State Environmental Planning Policy No 6 – Number of Stories in a Building	Yes - Not inconsistent. There is currently an 8.5m maximum height limit applicable and it is proposed to maintain this control, with a lesser height limit adjacent to the northern boundary.
State Environmental Planning Policy (Exempt & Complying Development Codes) 2008	Yes - Not inconsistent. Once the land is rezoned to *R2 Low Density Residential*, this SEPP will become applicable and can be used to facilitate streamlined assessment processes with future development on the subject land.
State Environmental Planning Policy No 32 – Urban Consolidation (Redevelopment of Urban Land)	Yes - No inconsistent. Rezoning the land to *R2 Low Density Residential* will enable in-fill development of low density housing which can be easily serviced by existing public infrastructure, transport and community facilities.
State Environmental Planning Policy (Affordable Rental Housing) 2015	Yes - Not inconsistent. Once the land is rezoned to *R2 Low Density Residential*, it can be utilised for the purposes of accommodating affordable rental housing.
State Environmental Planning Policy No. 44 – Koala Habitat Protection	Yes - There is no Koala habitat or "potential koala habitat" on the subject land.
State Policies	**Response**
State Environmental Planning Policy No. 36 – Manufactured Home Estates	Yes - Not inconsistent. Once the land is rezoned to *R1 General Residential*, it can be utilised for the purposes of accommodating a manufactured home estate thereby assisting the local community as an alternative to traditional housing forms.
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004	Yes - Not inconsistent. Once the land is rezoned to *R2 Low Density Residential*, it can be utilised for the purposes of accommodating housing for seniors or people with a disability thereby assisting the local community.
SEPP (Building Sustainability Index: BASIX) 200	Yes - This planning proposal will not contradict or hinder the application of this SEPP.

Overall, the Planning Proposal is not inconsistent with the general direction or specific requirements of any of the State Environmental Planning Policies as made pursuant to the EPA Act 1979 (as amended).

5.3.4 Is the Planning Proposal consistent with applicable Ministerial Directions (Section 117 Directions)?

Section 117 Directions details matters to be addressed in LEPs so as to achieve particular principles, aims and objectives or policies.

All relevant Directions can be adequately accommodated or departures justified in the preparation of an LEP amendment of the nature foreshadowed in this Planning Proposal.

Considerations of the relevant Section 117 Directions is summarised below:

TABLE 2: Applicable Section 117 Directions

s.117 Direction	Valid	Consistent	Comments
1. Employment & Resources			
1.1 Business and Industrial Zones	No	N/A	The Planning Proposal does not include or affect business or industrial zones.
1.2 Rural Zones	No	N/A	There are no existing or proposed rural zones to be affected by this proposal.
1.3 Mining, Petroleum Production and Extractive Industries	No	N/A	The site contains no known deposits of mineral resources and is not located directly adjoining identified resources or existing extractive industries.
1.4 Oyster Aquaculture	No	N/A	No oyster or aquaculture industries are proposed or likely to be impacted upon by this in-fill rezoning proposal.
1.5. Rural Lands	No	N/A	No rural zoned land is included in this in-fill rezoning proposal.
2. Environment & Heritage			
2.1 Environment Protection Zones	Yes	Yes	The land is currently zoned for E4 Environmental Living due to its perceived scenic landscape values. However, as has been evidenced in this document, the values believed to support the current zoning indicate that this is not the case. Accordingly, it is considered that the proposal to rezone the subject lands to R2 – Low Density Residential is not inconsistent with this Direction.

s.117 Direction	Valid	Consistent	Comments
2.2 Coastal Protection	No	N/A	No coastal protection zoned land is included in this in-fill rezoning proposal.
2.3 Heritage Conservation	No	N/A	No cultural heritage items or Conservation Areas are included in this in-fill rezoning proposal. There are no items or places of aboriginal significance located on the subject land or on land adjacent to the subject land.
2.4 Recreation Vehicle Areas	No	N/A	No recreational vehicle areas are included in this development.
3. Housing Infrastructure & Urban Development			
3.1 Residential Zones	Yes	The objectives of this direction are: • To encourage a variety and choice of housing types to provide for existing and future housing needs; • To make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services; and • To minimise the impact of residential development on the environment and resource lands. 3.1 (5) (b) state a Planning Proposal must not contain provisions, which will reduce the permissible residential density of land.	It is proposed to rezone land from *E4 Environmental Living* to permit the development of the land for low density residential purposes. The proposal is essentially an in-fill development and will assist in the efficient and effective use of existing infrastructure that surrounds and services the adjoining residential areas.
3.2 Caravan Parks & Manufactured Home Estates	No	N/A	No caravan parks or manufactured home estates are included in this development.
3.3 Home Occupations	Yes	The objective of this direction is to encourage the carrying out of low-impact small businesses in dwelling houses.	Home occupations would be a permissible land use under the proposed *R2 Low Density Residential* zone

s.117 Direction	Valid	Consistent	Comments
3.4 Integrating Land Use and Transport	Yes	The objective of this direction is to ensure that urban structures, building forms, land uses, street planning & subdivision designs achieve the following objectives: • Improving access to housing, jobs and services by walking, cycling and public transport, • Increasing the choice of available transport & reducing dependence on cars, • Reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and • Supporting the efficient and viable operation of public transport services.	The Planning Proposal seeks to provide additional housing in areas serviced by existing public transport (train and school bus services). The proposal is consistent with Improving Transport Choice – Guidelines for planning and development (DUAP 2001) and The Right Place for Business and Services – Planning Policy (DUAP 2001) as it encourages the use of public transport, walking and cycling.
3.5 Development near Licensed Aerodromes	No	N/A	The development is not located adjacent too, or adjoining an aerodrome.
3.6 Shooting Ranges	No	N/A	The development is not located adjacent too, or adjoining a shooting range.
4.Hazard & Risk			
4.1 Acid Sulphate Soils	No	N/A	The subject land not known to encompass acid sulphate soils.
4.2 Mine Subsidence and Unstable Land	No	N/A	This direction applies to all Councils that contain a mine subsidence district proclaimed pursuant to section 15 of the Mine Subsidence Compensation Act 1961 or that contain unstable land.
4.3 Flood Prone Land	Yes	N/A	The subject land is not identified as being flood prone.
4.4 Planning for Bush Fire Protection	No	N/A	The subject land is not designated as being bushfire prone.

s.117 Direction	Valid	Consistent	Comments
5. Regional Planning			
5.1 Implementation of Regional Strategies	Yes	N/A	The subject land is not located within the Sydney-Canberra Corridor Strategy.
5.2 Sydney Drinking Water Catchments	Yes	N/A	The subject land is not within the Sydney Drinking Water Catchment.
5.3 Farmland State & Regional Significant on the NSW Far North Coast	No	N/A	The subject land is not located on the Far North Coast of NSW.
5.4 Commercial and Retail Development along the Pacific Hwy North Coast	No	N/A	The land is not located along the Pacific Highway, North Coast.
5.5 Development in the vicinity of Ellalong, Paxton and Millfield (Cessnock)	No	N/A	The land is not in the vicinity of Ellalong, Paxton and Millfield (Cessnock LGA)
5.8 Second Sydney Airport: Badgerys Creek	No	N/A	The land is not adjoining or directly adjacent to the Second Sydney Airport: Badgerys Creek
6. Local Plan Making			
6.1 Approval and Referral Requirements	Yes	The objective of this direction is to ensure that LEP provisions encourage the efficient and appropriate assessment of development.	The Planning Proposal does not impose concurrence or referral requirements.
6.3 Site Specific Provisions	Yes	The objective of this direction is to discourage unnecessarily restrictive site-specific planning controls. 6.3 (4) (c) states a Planning Proposal that will amend another environmental planning instrument in order to allow a particular development proposal to be carried out must either:	It is proposed to introduce standard land use controls for the future development on the land that align with existing controls imposed by Campbelltown through its LEP, DCP and other relevant policies. The two (2) principal statutory controls to be introduced though the LEP amendment include: I. R2 Low Density Residential zone; and II. 500m2 minimum lot size

s.117 Direction	Valid	Consistent	Comments
6.3 Site Specific Provisions (Cont.)		▪ Allow that land use to be carried out in the zone the land is situated on, or ▪ Rezone the site to an existing zone already applying in the EPI that allows that land use without imposing any development standards or requirements in addition to those already contained in that zone, or ▪ Allow that land use on the relevant land without imposing any development standards or requirements in addition to those already contained in the principal EPI being amended.	As noted previously, all the surrounding land east, west and south are zoned *R2 Low Density Residential* with a minimum lot size of 500m2. Accordingly, it s considered that the proposed LEP controls recommended are consistent and compatible with the surrounding built environment

Overall, the Planning Proposal is not inconsistent with the general direction or specific requirements of any of the Section 117 Directions. Further, this Planning Proposal has addressed all Section117 Directions prescribed by the Minister as contained within the Environmental Planning & Assessment Act 1979 (as amended) and associated land use planning instruments.

5.4 Environmental, Social and Economic Impact

5.4.1 Is there any likelihood that critical habitats or threatened species, populations, ecological communities or their habitats will be adversely affected as a result of the proposal?

There are no known areas on the subject land that are of critical habitat, threatened species, populations or ecological communities affected by this Planning Proposal.

5.4.2 Are there any other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?

The proposal is for an in-fill development adjacent to existing established residential allotments within the suburb of Minto. A summary of the environmental impacts is outline in Table 3 below:

TABLE 3: Summary of Environmental Impacts

No.	Impact	Comment
I.	Water Quality	The Planning Proposal is for the development of the subject land with a minimum lot size of 500m2. The entire development will be connected to a reticulated sewer system, which eliminates the major cause of potential degradation of water quality. A stormwater strategy will be

		undertaken in accordance with the principles of WSUD.
II.	Water	A reticulated water supply is available and would be extended to service all lots within the development.
III.	Bushfire	The site is not identified as bushfire prone land.
IV.	Drainage	The land not identified as being flood prone. Strategies will need to be prepared to address potential overland stormwater flows following a positive Gateway Determination being issued.
V.	Waste	Wastes generated from the development can be managed at the local Waste Management Centre.
VI.	Noise	There is no major or detrimental noise generating activities adjoining or adjacent to the subject land that could adversely affect the amenity of future residents.
VII.	Air Quality	There are no major or detrimental dust, odour, fumes or particulate matter generating activities adjoining or adjacent to the subject land that could adversely affect the amenity of future residents.
VIII.	Traffic	The likely traffic generation from this development is well within the existing capacity of the surrounding local road network. A preliminary traffic assessment has been undertaken and this is attached in Annexure 3 at the rear of this Planning Proposal. Whilst a proposed subdivision design for the land has not yet been prepared, it is estimated that once fully developed, the site could house up to 35-40 new dwellings. It is calculated that this density has the potential to generate an additional 210 local traffic movements on the surrounding road network per day.

5.4.3 How has the Planning Proposal adequately addressed any social and economic effects?

The Proposal will increase the supply of residential land in close proximity to a range of educational establishments, sporting and cultural facilities, as well as the Minto Mall Shopping Centre.

An increase in the supply of land within the established suburb of Minto will have a positive short-term economic impact upon the local building and construction industry, increasing of the prospects of local employment on many fronts, both in design and construction. The local businesses at Minto and the wider Campbelltown / Macarthur region are likely to benefit through enhanced trade and commerce.

The new residential population will have a positive impact on key employment industries such as schools and education centres, cafes, restaurants and takeaway food services and will generate increased demand for these services, thereby providing a direct and ongoing economic benefit to the area.

The proposal has positive social and economic contributions as discussed above in the various Strategies by providing much needed housing choice in the LGA. Indeed, under the proposed scenario, no adverse social and/or economic impacts are foreshadowed, but rather positive impacts will accrue in this regard.

5.5 State and Commonwealth Interests

5.5.1 Is there adequate public infrastructure for the Planning Proposal?

Public infrastructure will be required to be augmented to support the increase in density on the subject land, as communicated in this Planning Proposal.

The nature and extent of augmentation will be finally determined having regard to more detailed investigations as part of the continued evolution of this Planning Proposal and subsequent detailed subdivisional planning processes.

As a minimum, the existing reticulated town water system and sewerage system in the adjoining urban area will need to be extended to service a new housing and further liaison will need to occur with the service provider in this regard, namely Sydney Water.

The logistics of providing the requisite infrastructure are considered economically and physically achievable as the subject land is contiguous with existing well-established urban residential development and the subject land has minimal physical constraints and natural hazards.

The nature of the subject land is such that a comprehensive Stormwater Management Plan predicated on the principles of Water Sensitive Urban Design can be readily designed and implemented as part of the overall development scheme.

Reticulated electricity, data and telecommunications facilities will also be provided as service infrastructure. Such are capable of ready installation in a pragmatic physical and economic sense.

Initial indications are that the likely increase in vehicle movement associated with an additional 35-40 lots will be able to integrate efficiently with the existing local road network, as well as the wider regional transport network.

Amplification and/or enhancement of public infrastructure will involve relevant contributions pursuant to S94 EPA Act and/or a Voluntary Planning Agreement. Such contributions will be determined in response to more detailed planning actions as the Planning Proposal progresses.

5.5.2 What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway Determination and have they resulted in any variations to the Planning Proposal?

The Gateway Determination will identify any necessary consultation required with State or Commonwealth Public Authorities. This will include:

a) Consultation required in accordance with a Ministerial Direction under section 117 of the EP&A Act: and
b) Consultation that is required because in the opinion of the Minister (or delegate), a State or Commonwealth public authority will or may be adversely affected by the proposed LEP.

Consultation would occur following the outcome of the Gateway Determination and Council would be responsible for carrying out this consultation in accordance with S57 of the EPA Act.

6.0 COMMUNITY CONSULTATION

Community consultation remains an important element of the Plan making process. The companion document *"A Guide to Preparing Local Environmental Plans"* outlines community consultation parameters.

The relevant provisions in respect of notification and the exhibition materials to support the consultation will be observed. Before proceeding to public exhibition, the Director General of Planning (or delegate) must approve the form of the Planning Proposal as being consistent with the "Gateway" Determination (EPA Act, s57(2)).

It is considered that this Planning Proposal is of a "low impact" nature as it is:

- Consistent with the pattern of surrounding land use zones and land uses
- Consistent with the strategic planning framework
- Presents no issues with regard to infrastructure servicing
- Not a principal LEP
- Does not reclassify public land.

As such a 28 day exhibition period is able to be conducted by way of direct correspondence to the surrounding owners and infrastructure providers, publication within the local press and information on Campbelltown City Council's website.

Additional criteria under 'A guide to preparing local environmental plans' require consideration of the following matters:

a) *If the provisions of the Planning Proposal include the extinguishment of any interests in the land, an explanation of the reasons why the interests are proposed to be extinguished.*

The Planning Proposal does not include the extinguishment of any interests in the land.

b) *The concurrence of the landowner, where the land is not owned by the relevant planning authority.*

Tangible Planning Solutions are acting on behalf of the landowners who initiated the preparation of the Planning Proposal. The subject lands comprise six (6) individual parcels under the ownership of six separate owners. It includes:

- Lot 4, DP 539244: 221 Eagleview Road, Minto (R. P. Patene)
- Lot 1, DP 719990: 223 Eagleview Road, Minto (R.R. & E.M. Ackerley)
- Lot 2, DP 719990: 225 Eagleview Road, Minto (S. & S. Russo)
- Lot 100, DP 706378: 227 - 229 Eagleview Road, Minto (D.R. & K.A. Marshall)
- Lot 10, DP 719990: 25 Goodsell Street, Minto (P. Phibbs)
- Lot 11, DP 719990: 27 Goodsell Street, Minto (B.L. & S.J. Gaudiello)

The owners have met with Council collectively as an expression of intent and good faith in seeking to undertake this process in a collaborative manner.

Table 4 below outlines an indicative timetable, including the major milestones dates for the orderly progression of this Planning Proposal:

TABLE 4: Major Milestones

Task	Planning Proposal Timeline											
	July 2016	August 2016	September 2016	October 2016	November 2016	December 2016	January 2017	February 2017	March 2017	April 2017	May 2017	June 2017
Resolution of Council to prepare a Plan												
Issue of Gateway Determination												
Prepare any outstanding studies												
Consult with required Agencies												
Exhibition of PP & technical studies												
Review of submissions												
Prepare & present Report to Council												
PP to DoP requesting draft LEP be prepared												

7.0 CONCLUSION

The preceding commentary has clearly established a case for the limited review the planning provisions as they pertain to the subject land.

Council is accordingly requested to take the necessary steps to commence the process of rezoning the subject lands from '*E4 – Environmental Living'* to *'R2 Low Density Residential'* as detailed in this submission.

Detailed infrastructure investigations will need to be undertaken and broad commitments to infrastructure provision made as the Planning Proposal is advanced.

Council, as the responsible Planning Authority, is requested to support and forward this Planning Proposal to the Department of Planning and Infrastructure for progressing through the "Gateway" in an expedient manner.

Prepared by:

Murray Blackburn-Smith

Annexure 1 – Preliminary Environmental Assessment (Flora & Fauna)

Greg Stone
Woodlands Environmental Management Pty Ltd
February 2016

Preliminary environmental assessment (flora and fauna) for a proposed development at Eagleview Road, Minto NSW

Prepared by Woodlands Environmental Management
133 Forest Road, Wingello NSW 2579
ABN 93 036 995 658
Tel: (02) 48844255 **Mob**: 0422279946
Email: woodlandsenviro@gmail.com.au

Prepared for Mr Murray Blackburn-Smith
Tangible Planning Solutions

11th February 2016

Source: Google Maps

CONTENTS

Appendices

Appendix 1 Certification

Appendix 2 Curriculum Vitae, licensing and insurance

Report title	**Preliminary environmental assessment (flora and fauna) for a proposed development at Eagleview Road, Minto NSW**
Date	11th February 2016
Report preparation	Woodlands Environmental Management 133 Forest Road, Wingello NSW 2579 ABN 93 036 995 658 **Tel**: (02) 48844255 **Mob**: 0422279946 **Email**: woodlandsenviro@gmail.com.au Greg Stone – BAppSc (Parks, Recreation & Heritage), GradCert (Science Communication), AdvDip (Land Management), AssDip (Land Management)
Proponent	Mr Murray Blackburn-Smith
Agent	Tangible Planning Solutions
Property Address	Eagleview Road, Minto NSW
Property Lot & DP	Lot 100 DP 706378, Lot 4 DP 539244, Lots 1, 2, 10 &11 DP 719990

1. Introduction and summary

A Planning Proposal is seeking to rezone six parcels of land from 'E4 Environmental Management' to 'R2 Low Density Residential'. An assessment of potential impacts on flora and fauna is required by Campbelltown City Council to support the proposal.

Summary
It is concluded that the developed proposed is unlikely to have a significant impact on native flora and fauna, including threatened species, population or endangered ecological communities, or their habitats. Refer to **13. Conclusions.**

2. Aims, limitations and methods of the assessment

Aims

The aims of the preliminary assessment are to identify:

1. Vegetation types and communities potentially present at the property, including endangered ecological communities,

2. Flora potentially present at the property, including threatened species and populations,

3. Fauna associated with habitat types potentially present at the property, including threatened species and populations,

4. Any potential impacts of the proposed development upon flora and fauna at the site with particular regard to threatened species, populations or ecological communities, or their habitats, and

5. Opportunities to avoid, minimise or mitigate impacts

Limitations

Threatened Species Survey and Assessment: Guidelines for developments and activities (DEC, 2004) recognises that 'constraints are unavoidable and therefore must be acknowledged as limitations'. The limitations of the assessment are as follows:

1. The preliminary assessment has been prepared solely by referencing existing literature, databases and modelled mapping.

    i. Most databases accessed acknowledge limitations in accuracy, and that the data contained cannot be considered 'a comprehensive inventory and may contain errors and omissions.'

    ii. The primary vegetation map source is 'a reconstructed map through subjective analysis of vegetation groups described and mapped by existing studies' and therefore of limited accuracy.

2. No site inspection or field work was undertaken in relation to the preparation of the assessment and therefore:

    i. The accuracy of vegetation mapping has not been verified.

    ii. Details of groundcover composition, the presence of weeds, and the condition of the vegetation cannot be determined.

    iii. The presence or absence of potentially significant habitat features such as tree hollows, fallen timber, rocky outcrops etc. cannot be determined.

3. The assessment does not fully address 'matters for consideration' concerning impacts on threatened species, populations or ecological communities, or their habitats contained in Section 79C of the Environmental Planning & Assessment Act 1979.

4. The assessment has not been prepared in accordance with NSW Office of Environment and Heritage's guidelines for survey and assessment www.environment.nsw.gov.au/threatenedspecies/surveyassessmentgdlns.htm

5. The assessment does not include the preparation of Assessments of Significance for Threatened Species in accordance with s. 5A of the *Environmental Planning and Assessment Act 1979* and NSW Office of Environment and Heritage's guidelines: http://www.environment.nsw.gov.au/threatenedspecies/tsaguide.htm

Methods

In order to fulfil the aims of the assessment within the constraints provided by the limitations, the following methods have been adopted in this report:

1. Vegetation structural attributes (or class) act as surrogates for the habitat requirements of native flora and fauna.

   The NSW Office of Environment and Heritage Threatened Species website (www.environment.nsw.gov.au/threatenedSpeciesApp/Habitat) enables the investigation of the associations of species with vegetation communities in NSW. This facilitates the preparation of lists of threatened species of flora and fauna potentially occurring within vegetation classes located within sub-regions of Catchment Management Areas (see Table 2).

2. The precautionary principle has been adopted.

   Threatened Species Survey and Assessment: Guidelines for developments and activities (DEC, 2004) recognises that 'constraints are unavoidable and therefore must be acknowledged as limitations. The report should acknowledge such limitations and **adopt the precautionary principle**.'

   'In addressing limitations to the survey and assessment process, it is always important to consider the precautionary principle. The precautionary principle is defined as (*NSW Protection of the Environment Administration Act 1991* s6(2)):
   "if there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation".

   It is advised that where adequate surveys have not been conducted within the study area due to limitations, the precautionary principle should always be adopted. This involves assuming that threatened biodiversity which are likely to occur in the study area (based on the presence of suitable habitat and recent records) inhabit the whole of the study area.' (DEC, 2004 p.34)

3. Site location

Site location

The c. 3.8ha site is located at Minto, approximately 4km north-east of Campbelltown NSW. Refer Figure 1.

IBRA Bioregion

Sydney Basin

LGA

Campbelltown

CMA

Sydney Metro

CMA Sub-region	Cumberland

4. Subject site and study area

Subject site	For the purposes of this assessment, the subject site is the c. 3.8ha to be directly affected by the proposed development, comprising Lot 100 DP 706378, Lot 4 DP 539244, Lots 1, 2, 10 &11 DP 719990. Refer Figure 4.
Study area	The study area includes the subject sites and any additional areas which are likely to be affected by the proposal, either directly, indirectly or cumulatively. Refer Figure 4.

5. Site description

Landform	The subject site is located gently sloping land with a generally north-easterly aspect.
Elevation	Ranges from c. 100m to 100m asl.
Geology and soils	Wianamatta Group Liverpool Sub-Group. Shale with some sandstone beds.
Climate	Campbelltown records a mean minimum annual temperature of 10.4°C and a mean maximum annual temperature of 23.3 °C. The mean annual rainfall is 829.1mm.
Vegetation	Over 95% of the subject site has been historically cleared of original vegetation and presently supports highly modified grassland and domestic gardens and landscaping dominated by exotic species. Some scattered, isolated semi-mature *Eucalyptus* spp. are present.
Land use	The subject lands are currently developed into six large lot residential housing parcels. Each parcel generally comprises a large well-established dwelling house, associated garages and storage buildings, outdoor entertainment areas and landscaped gardens that were developed in the 1980's. Prior to this, the subject lands were part of a much larger poultry farm.
Adjoining properties	Surrounding development to the east, south and west, comprise low-density residential dwellings (minimum 450m^2 allotments). To the north, the land is characterised by large lot residential development (minimum 4000m^2 allotments).

6. Proposed development

The Planning Proposal is seeking to rezone six parcels of land from 'E4 Environmental Management' to 'R2 Low Density Residential'. The rezoning will enable the future subdivision of land into 450m^2 allotments. It is anticipated that the potential yield would be a maximum of twenty-six allotments.

7. Flora assessment

7.1 Database and literature search

Reference was made to the following literature and databases:

NSW Vegetation Map Viewer managed by NSW Office of Environment and Heritage.
This database which provides online access for viewing vegetation maps held in the Vegetation Information System (VIS) Map Catalogue administered by the Office of Environment and Heritage.

Atlas of NSW Wildlife managed by NSW Office of Environment and Heritage.
This database was used to produce a list of Threatened Species (species, populations and communities) known or predicted to occur within a selected study area within the Cumberland subregion.

Threatened species profile search was used to produce a list of threatened species within the Cumberland subregion and further refined to match habitat types.

7.2 Database and literature search results – vegetation types and communities

The database and literature searched utilised a variety of vegetation classification systems, therefore for the purpose of this report all vegetation types have been re-classified to match *Biometric* vegetation types where possible. Refer Table 1.

The database and literature search recorded the presence of no *Biometric* vegetation types or communities and three non-*Biometric* vegetation types.

- Weeds and Exotics
- Non forest system
- Urban system

Endangered Ecological Communities

No endangered or threatened ecological communities listed under the *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* are recorded as being present at the subject site.

Overcleared vegetation types

No vegetation types or communities listed as 'overcleared vegetation types' i.e. over 70% cleared within the Sydney Metro CMA are recorded as being present at the subject site.

7.3 Database and literature search results – flora

The NSW Office of Environment and Heritage *Combined geographic and habitat search* was utilised to determine the threatened species of flora associated with the vegetation classes or habitats within the Cumberland sub-region of the Sydney Metro Catchment Management Area http://www.environment.nsw.gov.au/threatenedSpeciesApp/GeoHabitatSearch.aspx
Refer Table 3.

Three threatened species of flora are listed as being associated vegetation classes present within the subject site.

Highly disturbed areas with no or limited native vegetation	*Hibbertia puberula* Hibbertia puberula *Pimelea spicata* Spiked Rice-flower *Pultenaea pedunculata* Matted Bush-pea

7.4 Comments and discussion on flora

In the absence of field surveys to assess the nature, extent and condition of habitats, or to locate flora, the 'precautionary principle' has been adopted. This follows the advice of the NSW Office of Environment & Heritage i.e. 'It is advised that where adequate surveys have not been conducted within the study area due to limitations, the precautionary principle should always be adopted. This involves assuming that threatened biodiversity which are likely to occur in the study area (based on the presence of suitable habitat and recent records) inhabit the whole of the study area.' (DEC, 2004 p.34)

It is however considered that an assessment of existing vegetation mapping, aerial photography, and current and past land use are sufficient to reach conclusions as to the likelihood of threatened biodiversity occurring with the subject site.

Endangered Ecological Communities
The presence of any Endangered Ecological Communities within the subject site is considered highly unlikely due to the nature and extent of clearing and modification of the vegetation, and ongoing land use.

Threatened species
The presence of any threatened species of flora within the subject site is considered highly unlikely due to the nature and extent of clearing and modification of the vegetation, and ongoing land use.

7.5 Assessment of impacts on flora

The proposed subdivision of the subject site into 450m^2 allotments is likely to result in the clearing and disturbance of land presently classified as 'Highly disturbed areas with no or limited native vegetation' and dominated by weeds and exotic species. Impacts on native flora are therefore likely to be negligible.

8. Fauna assessment

8.1 Database and literature search

Reference was made to the following literature and databases:

The Atlas of NSW Wildlife was used to produce a list of Threatened Species (species, populations and communities) known or predicted to occur within a selected study area within the Cumberland subregion.

Threatened species profile search was used to produce a list of threatened species within the Cumberland subregion and further refined to match habitat types.

8.2 Database and literature search results - habitats

The NSW Office of Environment and Heritage *Threatened species profile search* uses vegetation classes as a surrogate for fauna habitat
http://www.environment.nsw.gov.au/threatenedSpeciesApp/

The database and literature searched utilised a variety of vegetation classification systems, therefore for the purpose of this report all vegetation classes have been re-classified to match *Biometric* vegetation types.

The database and literature search recorded the presence of no *Biometric* vegetation classes or habitats and one non-*Biometric* vegetation class: **Highly disturbed areas with no or limited native vegetation**

8.3 Database and literature search results - fauna

The NSW Office of Environment and Heritage *Combined geographic and habitat search* was utilised to determine the threatened species of fauna associated with the vegetation classes or habitats within the Cumberland sub-region of the Sydney Metro Catchment Management Area
http://www.environment.nsw.gov.au/threatenedSpeciesApp/GeoHabitatSearch.aspx
Refer Table 3.

Highly disturbed areas with no or limited native vegetation	Ten threatened species of fauna are listed as being associated with this vegetation class. *Botaurus poiciloptilus* Australasian Bittern *Burhinus grallarius* Bush Stone-curlew *Callocephalon fimbriatum* Gang-gang Cockatoo *Epthianura albifrons* White-fronted Chat *Hieraaetus morphnoides* Little Eagle *Lathamus discolour* Swift Parrot *Litoria aurea* Green and Golden Bell Frog *Miniopterus schreibersii oceanensis* Eastern Bentwing-bat *Myotis macropus* Southern Myotis *Polytelis swainsonii* Superb Parrot

8.4 Atlas of NSW Wildlife

No Threatened Species of fauna have been recorded within the subject site on the Atlas of NSW Wildlife. Species recorded within the locality have been located within areas of intact vegetation or of a significantly higher condition than that of the subject site. Refer Figures 6 and 7

8.5 General habitat features

Wildlife corridors The subject site is surrounded by urban development and is not located within a wildlife corridor.

SEPP 44 Koala habitat The Campbelltown LGA is listed in Schedule 1 of *State Environmental Planning Policy No. 44 – Koala Habitat Protection*.

Riparian habitats No waterways or drainage lines are recorded within the subject site.

8.6 Comments and discussion on fauna

In the absence of field surveys to assess the nature, extent and condition of habitats, or to locate fauna, the 'precautionary principle' has been adopted. This follows the advice of the NSW Office of Environment & Heritage i.e. 'It is advised that where adequate surveys have not been conducted within the study area due to limitations, the precautionary principle should always be adopted. This involves assuming that threatened biodiversity which are likely to occur in the study area (based on the presence of suitable habitat and recent records) inhabit the whole of the study area.' (DEC, 2004 p.34)

It is however considered that an assessment of existing vegetation and habitat mapping, aerial photography, and current and past land use are sufficient to reach conclusions as to the likelihood of threatened biodiversity occurring with the subject site.

Fauna habitats potentially utilised by a range of birds, reptile, mammals and amphibians, including threatened species, include i. trees (dead or alive) with hollows, cracks and fissures, ii. fallen timber with hollows, iii. rocky outcrops, loose rocks, and overhangs, iv. dense understorey, particularly with spikey shrubs, v. ephemeral waterways, soaks, drainage depressions, swamps etc. On the basis of database and literature searches, it is considered unlikely that any of the above habitat features are present within the subject site.

Threatened species
The presence of any threatened species of fauna within the subject site is considered highly unlikely due to the nature and extent of clearing and modification of the habitat, and ongoing land use.

8.7 Assessment of impacts on fauna

The proposed subdivision of the subject site into 450m^2 allotments is likely to result in the clearing and disturbance of land presently classified as 'Highly disturbed areas with no or limited native vegetation' and supporting little significant habitat for native species. Impacts on native fauna are therefore likely to be negligible.

9. Ecological constraints analysis

An ecological constraints analysis was undertaken for the subject site using standard criteria (refer Table 4). The subject site is rated within the lowest ecological constraints class (refer Table 5).

10. Management of impacts

Avoiding impacts
Minimising impacts
Mitigating impacts

No measures or actions have been proposed for the purpose of avoiding, minimising or mitigating impacts on flora and fauna, and no measures are considered necessary.

11. Matters of National Environmental Significance (EPBC Act)

No Matter of National Environmental Significance have been recorded at the subject site and none are likely to be present.

12. Conclusions

It is concluded that:

1. No endangered or threatened ecological communities listed under the *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* are recorded as being present at the subject site.

2. The presence of any Endangered Ecological Communities within the subject site is considered highly unlikely due to the nature and extent of clearing and modification of the vegetation, and ongoing land use.

3. The presence of any threatened species of flora within the subject site is considered highly unlikely due to the nature and extent of clearing and modification of the vegetation, and ongoing land use.

4. No vegetation types or communities listed as 'overcleared vegetation types' i.e. over 70% cleared within the Sydney Metro CMA are recorded as being present at the subject site.

5. The proposed subdivision of the subject site into 450m^2 allotments is likely to result in the clearing and disturbance of land presently classified as 'Highly disturbed areas with no or limited native vegetation' and dominated by weeds and exotic species. Impacts on native flora are therefore likely to be negligible.

6. No Threatened Species of fauna have been recorded within the subject site on the Atlas of NSW Wildlife. Species recorded within the locality have been located within areas of intact vegetation or of a significantly higher condition than that of the subject site.

7. The presence of any threatened species of fauna within the subject site is considered highly unlikely due to the nature and extent of clearing and modification of the habitat, and ongoing land use.

8. The proposed subdivision of the subject site into 450m^2 allotments is likely to result in the clearing and disturbance of land presently classified as 'Highly disturbed areas with no or

limited native vegetation' and supporting little significant habitat for native species. Impacts on native fauna are therefore likely to be negligible.

13. References

DEC (2004) *Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft),* New South Wales Office of Environment and Heritage, Hurstville, NSW.

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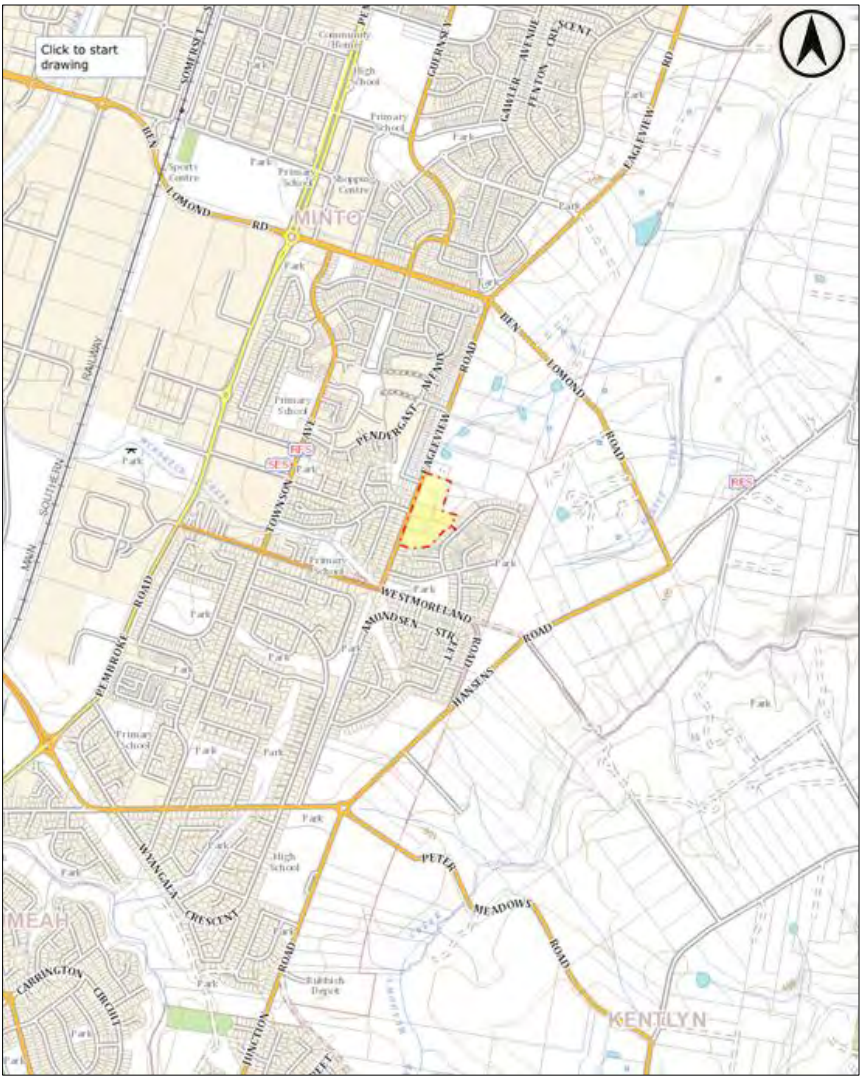
Figure 1: Location of Eagleview Road, Minto NSW



Source: SIX Maps

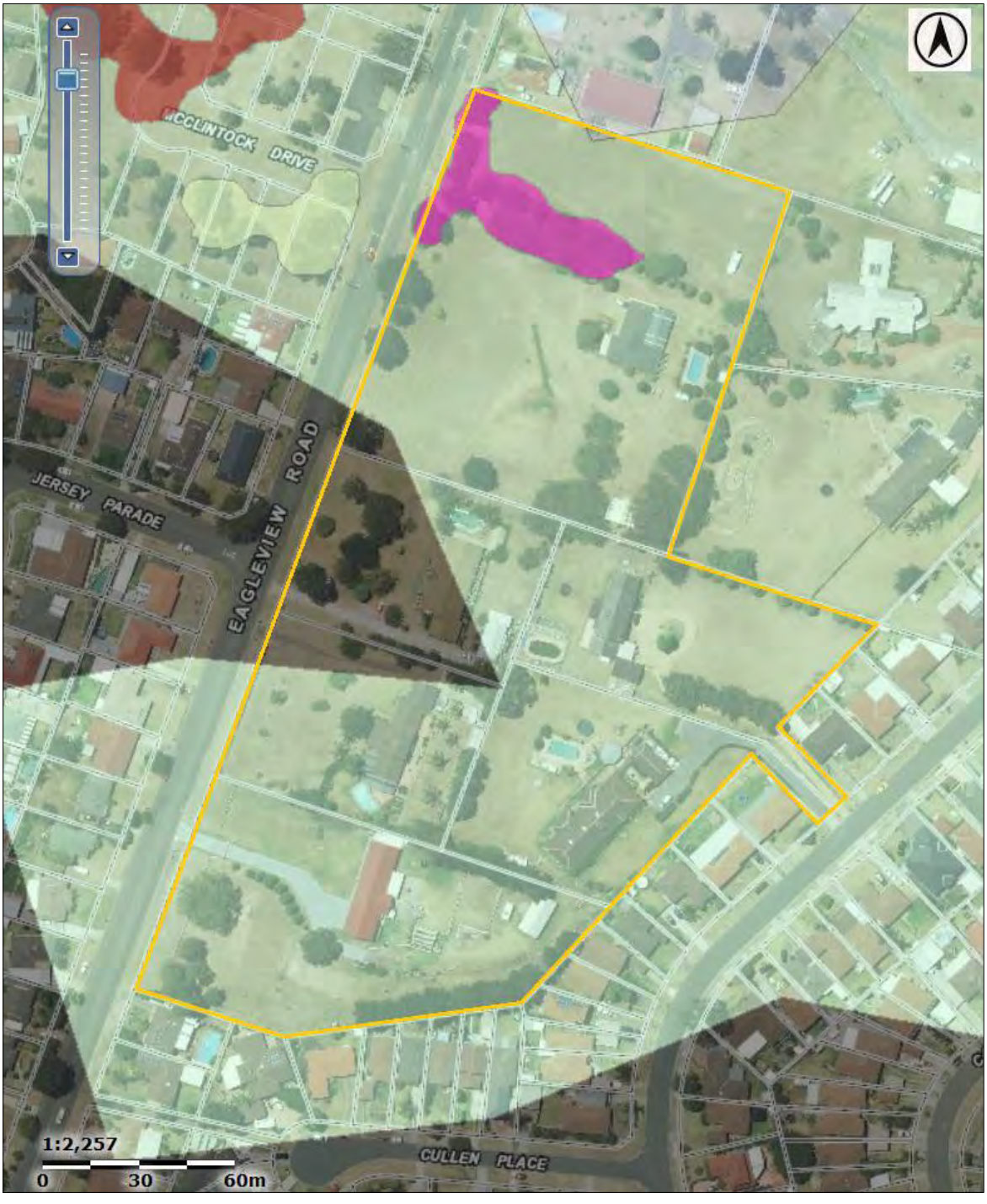
Figure 2: Subject site at Eagleview Road, Minto NSW

Source: SIX Maps

Figure 3: Aerial image of Eagleview Road, Minto NSW

Source: SIX Maps

Figure 4: Vegetation map at Eagleview Road, Minto NSW



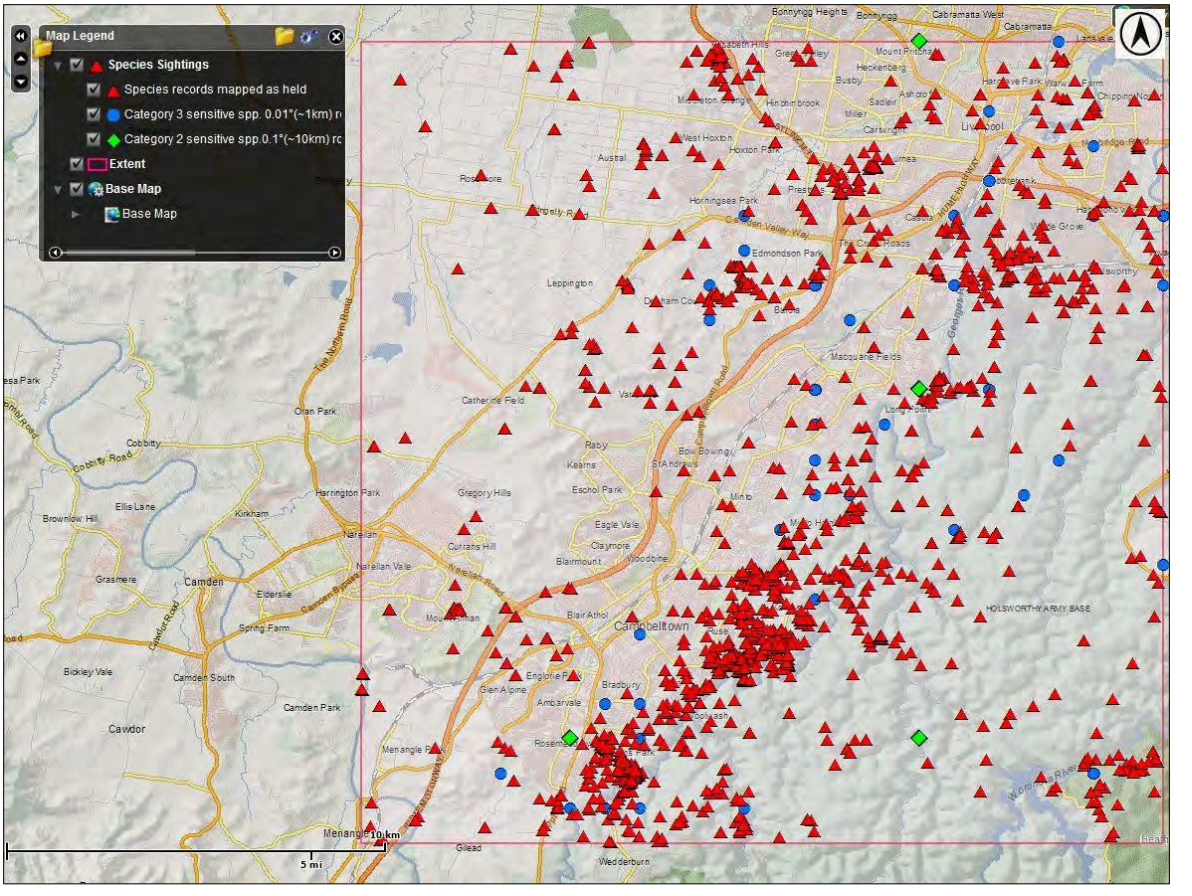
	Map source	Vegetation type
	SydneyMetroArea_v2_0_2013_E_3817	Weeds and Exotics
	Central_ebd_VISmap_181	Non forest system
	Central_ebd_VISmap_181	Urban system

Figure 5: Habitat map at Eagleview Road, Minto NSW

Source: Six Maps

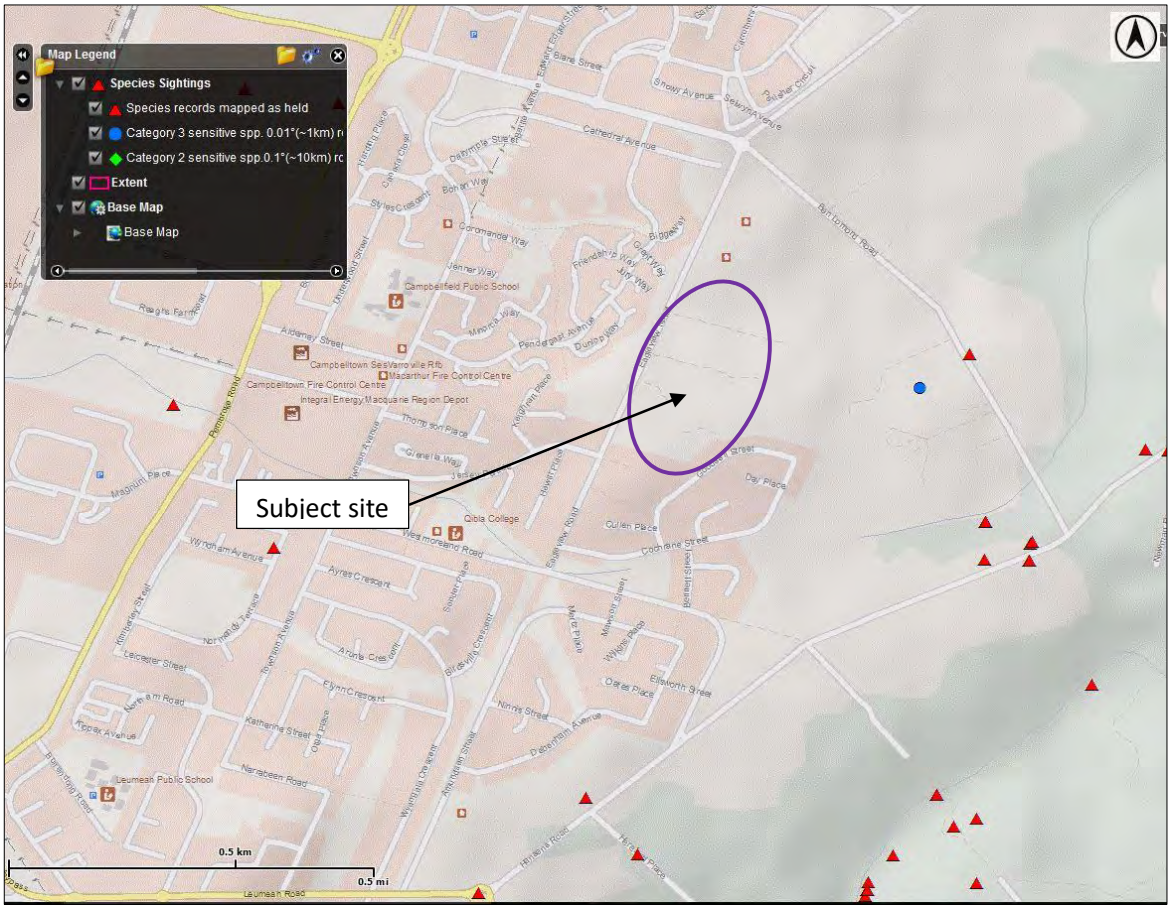
	NSW Office of Environment and Heritage ecosystems / vegetation formations
	Miscellaneous ecosystems: Highly disturbed areas with no or limited native vegetation

Figure 6: Atlas of NSW Wildlife map 1



Source: Atlas of NSW wildlife

Figure 7: Atlas of NSW Wildlife map 2



Source: Atlas of NSW wildlife

Table 1: Vegetation communities mapped at Eagleview Road, Minto NSW

Mapped vegetation community	***Biometric* type**	***Biometric* formation**	***Biometric* class**	**Conservation status**
Weeds and Exotics	Not applicable	Not applicable	Not applicable	Not applicable
Non forest system	Not applicable	Not applicable	Not applicable	Not applicable
Urban system	Not applicable	Not applicable	Not applicable	Not applicable

Table 2: Threatened Species recorded in the Atlas of NSW Wildlife within 10km of Eagleview Road, Minto NSW

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1Â°; ^^ rounded to 0.01Â°). Copyright the State of NSW through the Office of Environment and Heritage. Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) or Commonwealth listed Entities in selected area [North: -33.9 West: 150.74 East: 150.97 South: -34.13] returned a total of 2,045 records of 74 species. Report generated on 10/02/2016 10:37 AM

Kingdom	Class	Family	Scientific Name	Common Name	NSW status	Comm. status	Records
Animalia	Amphibia	Myobatrachidae	*Heleioporus australiacus*	Giant Burrowing Frog	V,P	V	18
Animalia	Amphibia	Myobatrachidae	*Pseudophryne australis*	Red-crowned Toadlet	V,P		43
Animalia	Amphibia	Hylidae	*Litoria aurea*	Green and Golden Bell Frog	E1,P	V	14
Animalia	Reptilia	Varanidae	*Varanus rosenbergi*	Rosenberg's Goanna	V,P		4
Animalia	Reptilia	Elapidae	*^Hoplocephalus bungaroides*	Broad-headed Snake	E1,P,2	V	3
Animalia	Aves	Anatidae	*Stictonetta naevosa*	Freckled Duck	V,P		1
Animalia	Aves	Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1,P		1
Animalia	Aves	Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E	1
Animalia	Aves	Accipitridae	*Circus assimilis*	Spotted Harrier	V,P		1
Animalia	Aves	Accipitridae	*Hieraaetus morphnoides*	Little Eagle	V,P		26
Animalia	Aves	Accipitridae	*^^Lophoictinia isura*	Square-tailed Kite	V,P,3		3
Animalia	Aves	Falconidae	*Falco subniger*	Black Falcon	V,P		2
Animalia	Aves	Burhinidae	*Burhinus grallarius*	Bush Stone-curlew	E1,P		2
Animalia	Aves	Cacatuidae	*^^Callocephalon fimbriatum*	Gang-gang Cockatoo	V,P,3		4
Animalia	Aves	Cacatuidae	*^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2		7

Animalia	Aves	Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V,P		39
Animalia	Aves	Psittacidae	*^^Lathamus discolor*	Swift Parrot	E1,P,3	E	11
Animalia	Aves	Strigidae	*^^Ninox connivens*	Barking Owl	V,P,3		2
Animalia	Aves	Strigidae	*^^Ninox strenua*	Powerful Owl	V,P,3		14
Animalia	Aves	Tytonidae	*^^Tyto tenebricosa*	Sooty Owl	V,P,3		2
Animalia	Aves	Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P		1
Animalia	Aves	Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V,P		1
Animalia	Aves	Meliphagidae	*Anthochaera phrygia*	Regent Honeyeater	E4A,P	CE	5
Animalia	Aves	Meliphagidae	*Epthianura albifrons*	White-fronted Chat	V,P		1
Animalia	Aves	Meliphagidae	*Epthianura albifrons*	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V,P		1
Animalia	Aves	Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		6
Animalia	Aves	Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	V,P		53
Animalia	Aves	Petroicidae	*Petroica boodang*	Scarlet Robin	V,P		19
Animalia	Aves	Petroicidae	*Petroica phoenicea*	Flame Robin	V,P		7
Animalia	Aves	Estrildidae	*Stagonopleura guttata*	Diamond Firetail	V,P		2
Animalia	Mammalia	Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	3
Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	Koala	V,P	V	807
Animalia	Mammalia	Burramyidae	*Cercartetus nanus*	Eastern Pygmy-possum	V,P		11
Animalia	Mammalia	Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V,P		3
Animalia	Mammalia	Macropodidae	*Petrogale penicillata*	Brush-tailed Rock-wallaby	E1,P	V	1
Animalia	Mammalia	Pteropodidae	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	102
Animalia	Mammalia	Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		24
Animalia	Mammalia	Molossidae	*Mormopterus norfolkensis*	Eastern Freetail-bat	V,P		46
Animalia	Mammalia	Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	V	3
Animalia	Mammalia	Vespertilionidae	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P		29

Animalia	Mammalia	Vespertilionidae	*Miniopterus australis*	Little Bentwing-bat	V,P		3
Animalia	Mammalia	Vespertilionidae	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V,P		31
Animalia	Mammalia	Vespertilionidae	*Myotis macropus*	Southern Myotis	V,P		31
Animalia	Mammalia	Vespertilionidae	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		43
Animalia	Gastropoda	Camaenidae	*Meridolum corneovirens*	Cumberland Plain Land Snail	E1		235
Animalia	Gastropoda	Camaenidae	*Pommerhelix duralensis*	Dural Woodland Snail		E	1
Plantae	Flora	Apocynaceae	*Cynanchum elegans*	White-flowered Wax Plant	E1,P	E	1
Plantae	Flora	Apocynaceae	*Marsdenia viridiflora subsp. viridiflora*	Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	E2		7
Plantae	Flora	Araliaceae	*Astrotricha crassifolia*	Thick-leaf Star-hair	V,P	V	1
Plantae	Flora	Casuarinaceae	*Allocasuarina diminuta subsp. mimica*	Allocasuarina diminuta subsp. mimica L.A.S.Johnson population in the Sutherland and Liverpool local government areas	E2		28
Plantae	Flora	Ericaceae	*Leucopogon exolasius*	Woronora Beard-heath	V,P	V	13
Plantae	Flora	Ericaceae	*Leucopogon fletcheri subsp. fletcheri*		E1,P		1
Plantae	Flora	Fabaceae (Faboideae)	*Dillwynia tenuifolia*		V,P		3
Plantae	Flora	Fabaceae (Faboideae)	*Pultenaea aristata*	Prickly Bush-pea	V,P	V	1
Plantae	Flora	Fabaceae (Faboideae)	*Pultenaea parviflora*		E1,P	V	1
Plantae	Flora	Fabaceae (Faboideae)	*Pultenaea pedunculata*	Matted Bush-pea	E1,P		14
Plantae	Flora	Fabaceae (Mimosoideae)	*Acacia pubescens*	Downy Wattle	V,P	V	112

Plantae	Flora	Grammitidaceae	*^^Grammitis stenophylla*	Narrow-leaf Finger Fern	E1,P,3		1
Plantae	Flora	Gyrostemonaceae	*^^Gyrostemon thesioides*		E1,P,3		31
Plantae	Flora	Lamiaceae	*Prostanthera saxicola*	Prostanthera saxicola population in Sutherland and Liverpool local government areas	E2		1
Plantae	Flora	Myrtaceae	*^^Callistemon linearifolius*	Netted Bottle Brush	V,P,3		3
Plantae	Flora	Myrtaceae	*Eucalyptus nicholii*	Narrow-leaved Black Peppermint	V,P	V	1
Plantae	Flora	Myrtaceae	*Eucalyptus scoparia*	Wallangarra White Gum	E1,P	V	2
Plantae	Flora	Myrtaceae	*Melaleuca deanei*	Deane's Paperbark	V,P	V	27
Plantae	Flora	Myrtaceae	*Syzygium paniculatum*	Magenta Lilly Pilly	E1,P	V	1
Plantae	Flora	Orchidaceae	*^Diuris aequalis*	Buttercup Doubletail	E1,P,2	V	1
Plantae	Flora	Orchidaceae	*^Genoplesium baueri*	Bauer's Midge Orchid	E1,P,2	E	1
Plantae	Flora	Orchidaceae	*^Pterostylis nigricans*	Dark Greenhood	V,P,2		1
Plantae	Flora	Orchidaceae	*^Pterostylis saxicola*	Sydney Plains Greenhood	E1,P,2	E	16
Plantae	Flora	Proteaceae	*Grevillea parviflora subsp. parviflora*	Small-flower Grevillea	V,P	V	20
Plantae	Flora	Proteaceae	*^^Persoonia hirsuta*	Hairy Geebung	E1,P,3	E	4
Plantae	Flora	Proteaceae	*Persoonia nutans*	Nodding Geebung	E1,P	E	46
Plantae	Flora	Rhamnaceae	*Pomaderris brunnea*	Brown Pomaderris	E1,P	V	4
Plantae	Flora	Thymelaeaceae	*Pimelea spicata*	Spiked Rice-flower	E1,P	E	36

Commonwealth status

V – Vulnerable E – Endangered CE Critically Endangered EEC – Endangered Ecological Community EP – Endangered Population
K – Known to occur P – Predicted to occur

NSW Status

1 - Sensitivity Class 1 (Sensitive Species Data Policy)
2 - Sensitivity Class 2 (Sensitive Species Data Policy)
3 - Sensitivity Class 3 (Sensitive Species Data Policy)
E1 - Endangered (Threatened Species Conservation Act 1995)

E2 - Endangered Population (Threatened Species Conservation Act 1995)
E3 - Endangered Ecological Community (Threatened Species Conservation Act 1995)
E4A - Critically Endangered (Threatened Species Conservation Act 1995)
E4B - Critically Endangered Ecological Community (Threatened Species Conservation Act 1995)
P - Protected (National Parks & Wildlife Act 1974)
V - Vulnerable (Threatened Species Conservation Act 1995)
V2 - Vulnerable Ecological Community (Threatened Species Conservation Act 1995)

Table 3: Threatened Species associated with vegetation classes and habitats present at Eagleview Road, Minto NSW and recorded within the Cumberland sub-region

Scientific Name	Common Name	NSW status	Comm. status	Status / Records	Recorded or mapped	Associated vegetation class	Suitable habitat
Botaurus poiciloptilus	Australasian Bittern	E	E	K	No	Yes	Unlikely
Burhinus grallarius	Bush Stone-curlew	E		K	No	Yes	Unlikely
Callocephalon fimbriatum	Gang-gang Cockatoo	V		K	No	Yes	Unlikely
Epthianura albifrons	White-fronted Chat	V		K	No	Yes	Unlikely
Hibbertia puberula	Hibbertia puberula	E		K	No	Yes	Unlikely
Hieraaetus morphnoides	Little Eagle	V		K	No	Yes	Unlikely
Lathamus discolor	Swift Parrot	E	E	K	No	Yes	Unlikely
Litoria aurea	Green and Golden Bell Frog	E	V	K	No	Yes	Unlikely
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V		K	No	Yes	Unlikely
Myotis macropus	Southern Myotis	V		K	No	Yes	Unlikely
Pimelea spicata	Spiked Rice-flower	E	E	K	No	Yes	Unlikely
Polytelis swainsonii	Superb Parrot	V		K	No	Yes	Unlikely
Pultenaea pedunculata	Matted Bush-pea	E		K	No	Yes	Unlikely

V – Vulnerable E – Endangered CE Critically Endangered EEC – Endangered Ecological Community EP – Endangered Population
K – Known to occur P – Predicted to occur L – Likely to be present N – Not possible for a desktop assessment

Vegetation class: Highly disturbed areas with no or limited native vegetation

Table 4: Flora and fauna constraints criteria and classes

Class	Constraint class features
1	These areas are characterised by one or a combination of the following. i. a derived plant community with or without fragmented canopy, disturbance in all lower strata and resilience is low or substantially depleted; and ii. fauna habitat features are highly simplified and limited to foraging resources to a narrow range of fauna groups.
2	These areas are characterised by one or a combination of the following. i. a native plant community with fragmented canopy and disturbance in all lower strata and resilience is low; ii. relatively isolated vegetation with sparse canopy connectivity to other areas of similar or better condition native vegetation; and iii. in addition to the vegetation there is a limited range of fauna habitat features primarily restricted to foraging resources for a medium range of fauna groups.
3	These areas are characterised by one or a combination of the following. i. Endangered Ecological Communities with a low resilience; ii. a low likelihood of occurrence of threatened fauna populations and species known from the locality based on habitat potential and the number and distribution of previous records or surveys; iii. a fully or partially structured native plant community. Two lower strata may be disturbed, but resilience is moderate with good canopy connectivity in at least one iv. location to adjoining areas of similar vegetation outside the subject site, and v. in addition n to the vegetation there is a limited range of fauna habitat features which may include tree hollows, logs on the ground, a leaf litter layer and rock outcrops.
4	These areas are characterised by one or a combination of the following. i. Endangered Ecological Communities with a low to moderate resilience; ii. a medium likelihood of occurrence of Endangered Ecological Communities, threatened flora and/or fauna populations and species known from the locality based on habitat potential and the number and iii. distribution of previous records or surveys; iv. a fully or partially structured native plant community. Two lower strata may be disturbed, but resilience is moderate with good canopy v. connectivity in at least one location to adjoining areas of similar vegetation outside the subject site; and vi. in addition to the vegetation there is a medium range of fauna habitat features including tree hollows, logs on the ground, a leaf litter layer and rock outcrops.

5	These areas are characterised by one or a combination of the following. i. Endangered Ecological Communities with a moderate to high resilience; ii. threatened flora or fauna populations and/or species; iii. a high likelihood of occurrence of Endangered Ecological Communities, threatened flora and/or fauna populations and species known from the locality based on habitat potential and the number and distribution of previous records and surveys; iv. a fully or partially structured native plant community. One lower strata may be disturbed, but resilience is moderate to high with good canopy v. connectivity in at least one location to adjoining areas of similar vegetation outside the subject site. vi. in addition to the vegetation there is a large range of fauna habitat features including small to large tree hollows, logs on the ground, a leaf litter layer, rock outcrops and permanent water.

Table 5: Ecological constraints analysis of a proposed development at Eagleview Road, Minto NSW

Vegetation types	Habitat / vegetation class	Description of vegetation	Vegetation disturbance	Connectivity	Additional habitat	Potential threatened species of flora (no.)	Potential threatened species of fauna (no.)	Endangered Ecological Community	Constraint class
Weeds and Exotics Non forest system Urban system	Highly disturbed areas with no or limited native vegetation	Over 95% of the subject site has been historically cleared of original vegetation and presently supports highly modified grassland and domestic gardens and landscaping dominated by exotic species. Some scattered, isolated semi-mature *Eucalyptus* spp. are present. The subject site is classified as 'Highly disturbed areas with no or limited native vegetation'.	High	Low	Low	0	0	0	1

Appendix 1: Certification

Woodlands

Environmental Management

Forest Road, Wingello, NSW, 2579

Tel. (02) 488 44255 Mobile 0422279946

E-mail: woodlandsenviro@gmail.com.au

ABN 93036995658

Report title:	Preliminary environmental assessment (flora and fauna) for a proposed development at Eagleview Road, Minto NSW
Report prepared by:	Greg Stone, Woodlands Environmental Management
Qualifications:	BAppSc (Parks, Recreation & Heritage), GradCert (Science Communication), AdvDip (Land Management), AssDip (Land Management)
Address:	Woodlands Environmental Management 133 Forest Road, Wingello, NSW 2579
Applicant Name:	Mr Murray Blackburn-Smith
Applicant Address:	c/o Tangible Planning Solutions,
Land to be developed:	Eagleview Road, Minto NSW
Proposed development:	A Planning Proposal is seeking to rezone six parcels of land from 'E4 Environmental Management' to 'R2 Low Density Residential'.
Certification:	I certify that I have prepared the contents of this report and to the best of my knowledge: • It reports on the potential impacts of the proposal as generally outlined in the concept application; • It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.
Disclaimer:	This report has been prepared to provide advice to the client on matters pertaining to the particular and specific development proposal as advised by the client and / or their authorised representatives. This report can be used by the client only for its intended purpose and for that purpose only. Should any other use of the advice be made by any person including the client then Woodlands Environmental Management advises that the advice should not be relied upon. The report and its attachments should be read as a whole and no individual part of the report or its attachments should be interpreted without reference to the entire report. The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all

	mapped features are to be confirmed by a registered surveyor.
Signature:	
Name:	Gregory John Stone
Date:	11th February 2016

Appendix 2: Curriculum Vitae, licensing and insurance

Curriculum Vitae

Name
Gregory John Stone

Contact details
Address: 133 Forest Road
Wingello NSW 2579

Email: woodlandsenviro@gmail.com.au

Telephone: (02) 48844255
Mobile: 0422279946

Qualifications and education
Bachelor of Applied Science (Parks, Recreation and Heritage)
Charles Sturt University

Graduate Certificate in Science Communication
Australian National University

Master of Environmental Management (candidate)
Charles Sturt University

Advanced Diploma in Land Management
University of Sydney

Associate Diploma in Land Management
University of New England

Name of the organization: **Woodlands Environmental Management**
Designation: Principal environmental consultant (self-employed)
Period: 1990 to present
Duties:

- Preparation of environmental assessments undertaken for development applications, rehabilitation projects and conservation agreements

- Preparation of environmental assessments undertaken in accordance with *Native Vegetation Act 2003, Threatened Species Conservation Act 1995, Threatened Species Conservation Amendment Act 2002,* the *Environmental Planning and Assessment Act 1979* and the *Commonwealth Environment Protection and Biodiversity Act 1999*

- Preparation of Assessments of Significance (Seven Part Tests) for Threatened Species and Endangered Ecological Communities.

- Preparation of Habitat Management Plans for the purpose of protecting Threatened Species of flora, fauna and Endangered Ecological Communities and their habitats.

- Vegetation surveying and mapping undertaken within conservation areas and bushland reserves on the Southern Tablelands

- Preparation and monitoring of Vegetation Management Plans.

- Preparation of management plans for natural areas incorporating fire, weed and water management and rehabilitation work.

- Delivery of lectures, training, workshops and field days conducted for NSW National Parks and Wildlife Service, Hawkesbury - Nepean Catchment Management Authority, Wingecarribee Shire Council, Department of Agriculture, Landcare NSW, Bushcare, TAFE NSW, Department Infrastructure, Planning and Natural Resources and community groups

Contracts with NSW Government

Name of the organization: **Hawkesbury-Nepean Catchment Management Authority**
Designation: Catchment Officer (part-time)
Period: August 2007 to August 2012
Duties: Administering the *Native Vegetation Act 2003,* undertaking assessments for Property Vegetation Plans.
Co-ordination of Southern Highlands and Tablelands Biolinks project including incentive, community education and conservation programs.

Name of the organization: **NSW Office of Environment and Heritage**
Designation: Conservation Partners Program contractor
Period: 2008 to present
Duties: Preparing Conservation Agreements with private landholders on properties of high conservation value across south-east NSW.

Insurances

Public and Products Liability Insurance
AIG Australia Limited
Policy No: 9621775CMB Expiry Date: 29/10/2016
Limit of Liability: $10,000,000

Professional Indemnity
CGU Insurance Limited
Policy No: 61MIS7141238 Expiry Date: 30/10/2016
Limit of Liability: $10,000,000

Licence

Greg Stone of Woodlands Environmental Management currently holds a **SCIENTIFIC LICENCE** issued under the *National Parks & Wildlife Act 1974*

Licence number is: **SL101033**

Class Name: **Biodiversity assesment/Species Impact Statement**
Ecological survey/consultancy

Annexure 2 – Visual and Landscape Analysis

Lindy Lean
Landscape Architect
(HLS Pty Ltd)
February 2016

Visual and Landscape Analysis

PROPOSED RESIDENTIAL RE-ZONING

221-229 Eagleview Road & 25-27 Goodsell Street Minto

Prepared by
Lindy Lean – Landscape Architect (HLS Pty Ltd)
PO Box 313 Ashfield NSW 2131

PRELIMINARY – 14 March 2016

CONTENTS

FIGURES

1.0 INTRODUCTION

This report provides a landscape and visual analysis of the proposed residential re-zoning of a parcel of six rural-residential lots in Minto. The lots are currently zoned as 'E4 Environmental Living' and the proposal is to rezone to R2 Low Density residential. There are currently six dwellings on the parcel, one on each lot. The site is currently surrounded by suburban residential development on the east, south and western sides (minimum 450m2 lots) and a larger lot rural residential area to the north (minimum 4000m2 lots). The site is bounded by Eagleview Road to the west.

The site has been identified in the draft report entitled "Visual Analysis of Campbelltown's Scenic Hills and East Edge Scenic Protection Lands" prepared in 2011 for Campbelltown City Council by Paul Davies Pty Ltd in association with Geoffrey Britton (referred to herein as East Edge Visual Study). The site is part of Unit 4 (E-LU4) in the East Edge Scenic Protection Lands.

This study undertakes a brief review of the planning framework that resulted in this site retaining its current zoning. This study then assesses the visual and landscape character of the existing landscape and determines its visual significance within the East Edge lands. The study assesses the proposed lot sites, the siting of dwellings within larger lots, and any effects the additional built forms and associated access and services will have on the visual landscape, and the East Edge Scenic Protection area.

Recommendations to minimise any effects the siting of the future dwellings may create conclude this report.

Source material was obtained through a site inspection, sampling the site visibility from public places and roads on 3rd, 8th and 10th February 2016, and from topographic maps and aerial to determine sub-regional and regional visibility from less accessible areas.

1.1 METHODOLOGY

To determine the degree of visual effect and form recommendations to minimise the impact on the environment of a development, it is necessary to evaluate a number of factors and the relationship between them.

These factors include:

- The existing visual landscape
- The significance of the existing visual landscape
- The visual usage of the affected areas
- The visual effect of the development.

2.0 HISTORICAL PLANNING CONTEXT

The New Cities of Campbelltown, Camden, Appin: Structure Plan (1973)

A review of *The New Cities of Campbelltown, Camden, Appin: Structure Plan* (1973) ('the Three Cities Report') has been undertaken to establish the historical planning context of the subject site.

The Three Cities Report, prepared by the State Planning Authority of New South Wales, was a structure plan for the new Macarthur region as 3 towns within an new city, an urban growth centre. The concept was one of three individual new cities, i.e. Campbelltown, Camden and Appin; ranging in size from 100,000 to 230,000 people, grouped about a major city centre and tertiary education complex.

For its time, the project was considered to be unique in its size and time scale, as a new town and decentralization project in Australia; equal to three cities the size of Canberra to be built in 30 years.

The proposal as detailed in the Three Cities Report is a key element in the Sydney Region Outline Plan ('SROP'). The SROP was published in 1968 and was prepared to guide the development of Sydney between 1970 and 2000; particularly the growth of new corridors to areas such as Green Valley, Campbelltown and Blacktown.

The Three Cities Report identified the three cities of Campbelltown, Camden and Appin.

Each City is divided into a series of urban districts ranging from 20,000 to 30,000 people, based on District Centres. District structure plans were prepared for particular districts in Campbelltown to provide the framework for detailed development control plans.

The subject site is located in the *Campbelltown New City*, and within District 3 Minto. Eagleview Road forms the eastern edge of the district and has a band of open space along its western edge. Refer Figure 1.

Figure 1:District 3 extract from the Three Cities Report.

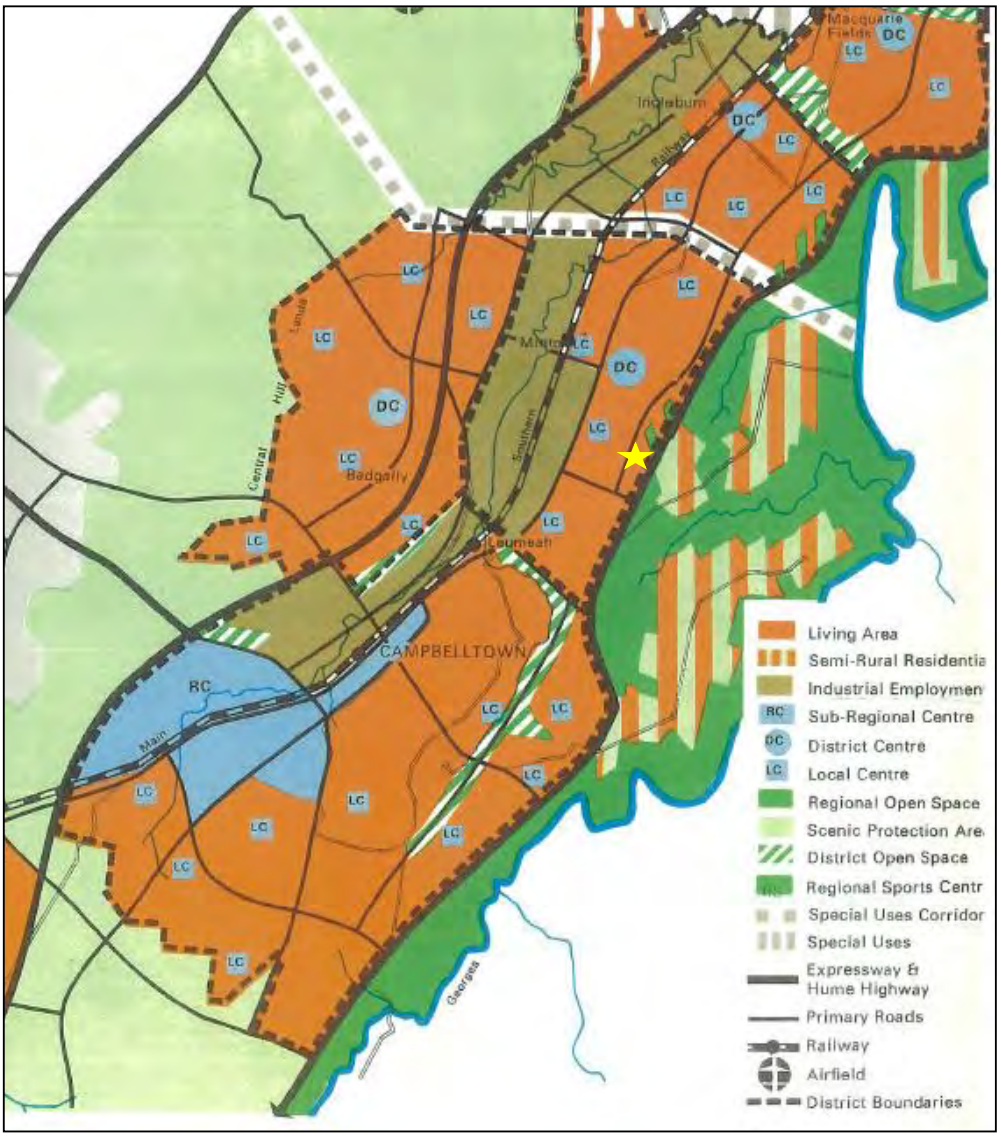


Figure 2: Extract from the Three Cities Plan with approximate area of the subject site identified.

The subject site is identified in the overall plan for Campbelltown as being *within a "Living Area"*. The Georges River Parkway loosely forms the eastern edge of the Living area. see Figure 2.

An Environmental Study to Determine Possible Future Controls on Development in the Scenic Protection Area Generally West of the Georges River Parkway (July 1987)

The subject site was also addressed as part of a later planning report - *An Environmental Study to Determine Possible Future Controls on Development in the Scenic Protection Area Generally West of the Georges River Parkway* (Ref: 861883-ID (150), dated: July 1987). This document was prepared by Wellings Smith and Byrnes for Campbelltown Council. It was prepared at the request of Council to identify the status of lands within the Georges River Scenic Protection Area; for which numerous applications had been received by Council for a reduction in lot size.

The site is located in Study Area 3 (SA3), see Figure 3.

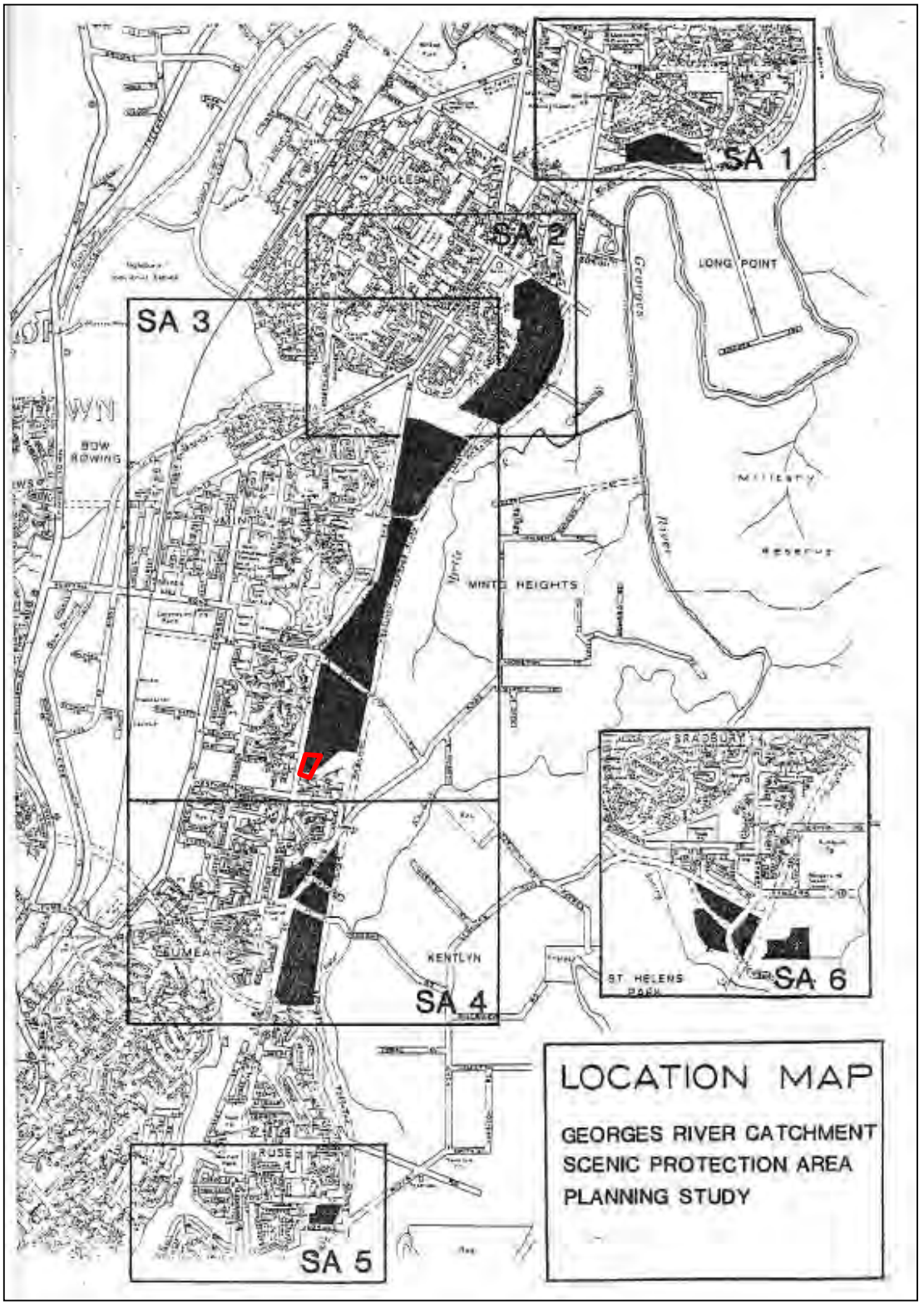


Figure 3: Extract from An Environmental Study to Determine Possible Future Controls on Development in the Scenic Protection Area Generally West of the Georges River Parkway, 1987. Subject site shown outlined.

SA3 is identified in the report as displaying a varied landscape –

Some of it is open grassland but, as those areas are much smaller than the area in SA3, they have far less visual significance. In the main, it is timbered country with the sense of forest being reinforced by the greater proximity to the forested reserve of the Georges River Parkway to Junction Road, the place from which most people view it. However, the quality of the forest landscape is not high being punctuated by frequent homes and clearings with some properties showing signs of overgrazing. The area is not visible from any significant external viewing places. There are extensive views to the east from the elevated land near the reservoir at the northern end of SA4.

The conclusion being that - *the landscape of this area is not of sufficient merit to warrant its continued preservation in its present form.*

The report also addresses the role of the Study Area in the City, providing –

Unlike the Centrals Hills Lands Area or even its larger neighbour - the Georges River Regional Open Space - the Study Area has no defined role in the Structure of the City. It is merely a remnant of countryside left between the urbanized Bow Bowing Creek catchment and the Georges River Parkway Reservation. Had the original planners of Campbelltown, Camden and Appin perceived that the Parkway would not be built for many years, or that it might never be built, they may very well have ignored the rather fine distinction between the controls in the Study Area and those applying to other areas east of the Parkway. Without the physical barrier of that road, there may have been little reason for the Study Area being distinguished, as it is, by its inclusion in what are essentially planning instruments related to the urban area of the City.

It is noted that the road referred to above is the proposed 'Expressway' (now known as Georges River Parkway) identified on the above extract from the Three Cities Report, see Figure 2.

This report further provides –

Despite the similarity in the zoning controls applying to the Study Area and to the privately owned land in the Regional Open Space, it is probably more realistic to consider the Study Area as part of the central belt of urban development than the Regional Open Space by the Parkway.

This report also acknowledges the reference to the early reports on the planning of Campbelltown - the State Planning Authority's "Three Cities Structure Plan" – that suggest that the Study Area was not separately considered at that time.

Having regard to the abovementioned findings of this report, it is evident that the subject site was considered as being more suited for urban development as opposed to being conserved as part of the Georges River Regional Open Space area.

CONCLUSIONS FROM REPORTS

The reports do not address the retention of the East Hills for its contribution to the soft ridgeline on the East Edge. However a soft ridgeline is not necessarily created by a rural living zoning, as cleared market garden areas and large mansions surrounded by conifers along Eagleview Road can attest, but retention of existing tall trees. It can also be created, by planting of strips of vegetation along ridgelines and scattering trees within residential areas.

EAST EDGE – VISUAL STUDY

A Visual Analysis of Campbelltown's Scenic Hills and East Edge Scenic Protection Lands Paul Davies Pty Ltd in association with Geoffrey Britton (Environmental Design Consultant) was prepared for Campbelltown Council, dated October 2011.

It notes:

"The southern-most tip is more densely settled and reads as large-lot residential development." P333

The conclusions of the report East Edge Visual Study are discussed in Section 5 of this report.

Figure 4: Extract from Visual Analysis of Campbelltown's Scenic Hills and East Edge Scenic Protection Lands Paul Davies Pty Ltd in association with Geoffrey Britton (Environmental Design Consultant). October 2011 p49

RECENT DEVELOPMENT

Since the East Edge Visual Study was completed, the Minto Renewal project has extended along the ridgeline from Ben Lomond Road to land opposite the site that was until recently Kyngmount Park. In mid 2014, a number of scattered trees on the Kygmont Park site were removed and small lot two storey residential houses are currently being constructed on the ridgeline, with the park developed downslope. The Oneminto DCP (2006) prepared by Landcom for the site shows a pair of 3 storey developments on the top of the ridgeline on Eagleview Road as a site entry, opposite the driveway to No.221 on our subject site. These lots are currently vacant.

The housing proposed and under construction will have a significant impact on the views and amenity of the residents on the subject site.

3.0 SITE DESCRIPTION AND PHYSICAL SETTING

The subject site is on a ridge, with the Minto residential area down slope to the west, east and south.

It is currently residential with larger houses, though still modest in scale, set on large lots. The houses on Eagleview Road are set back 40m from the road boundary, and are mostly single storey (225 has a small second storey) built on or close to the ridgetop. The houses on battle-axe blocks fronting Goodsell Street are larger with no 27 being double storey. The houses were all built 40-50 years ago. They are set within open grassland. There are some formed garden areas, entertainment areas and outbuildings surrounding the houses.

The land is steep within the frontages of the lots on Eagleview Road, rising to a much flatter plateau on the ridge.

Trees are scattered throughout the site and vary in age. The Radiata Pines along Eagleview Road at the north-western end of the site are very mature, and the Paul Davies report speculates that they may have belonged to the property Kyngmont, which was on the western side of Eagleview Road (p363).

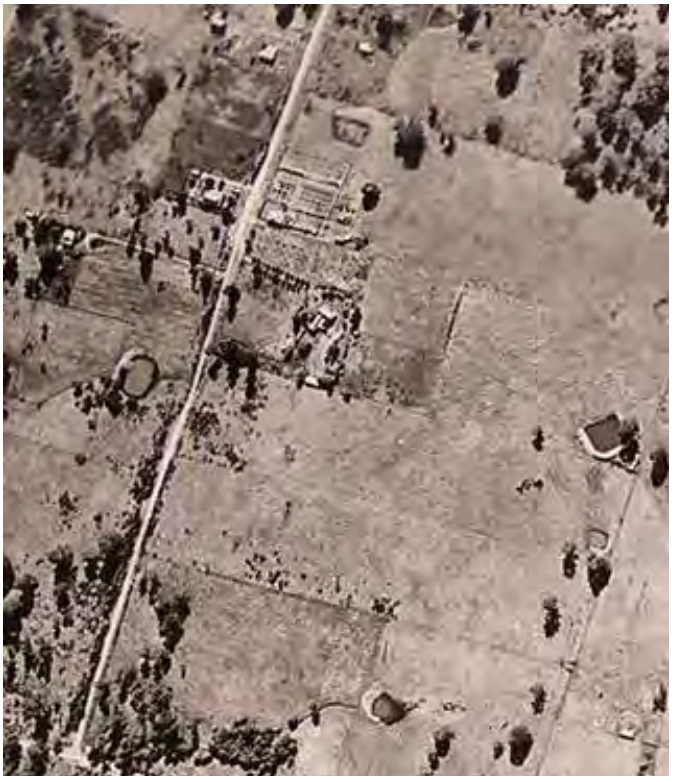
The brushbox avenue forming the driveway to the 221 Eagleview Road is a lesser age, but greater than 60 years old. Similarly the Coral trees at the south-eastern corner of this lot are of significant age, though are an environmental weed.

Many of the eucalypts and other exotic trees that exist on the site today, are not visible on older photos of the area, and residents have confirmed that they were planted by current or former owners of the houses when the lots were originally subdivided. There are several rows of trees marking driveways, being the conifers at number 229, the she-oaks at number 29, and the brushbox at number 221.

Radiata pines at number 229 follow two of the boundaries. The owner of 229 has advised that the neighbours to the south are not fond of the pines on their northern boundaries as they shade and dominate their backyards. Some in the row have died and been removed in the past.

A variety of native and exotic trees have been planted in the front yard of number 225, and these have grown to block views to the house from the street, but also limit panoramic views from the house.

There are some eucalypts planted as a row on the rear and side boundaries of number 225, however the group of eucalypts in the south western corner of the site, on number 229, are the only stand of native trees on the site.



Row of brush box trees forming driveway to No. 221 Eagleview Road, and pines on Eagleview Road are visible in 1956 photo, as well as a single remnant pine on the boundary between 221 and 223. Existing trees are also visible in what was Kyngmount Park, opposite the driveway. A single dwelling is on No. 221 and the remainder of site is cleared rural land at this time.

This photo shows that the majority of the vegetation on the site has been planted following subdivision of the land into the current large lots. Apart from a few scattered eucalypts there is no remnant bushland.

Source: NSW Dept of Lands Aerial photo, found on p336 East Edge Visual Study, Paul Davies 2011.

This recent photo, taken Saturday 13 Feb 2016, shows the same area.

Source: Nearmap

Aerial photograph prior to Minto Redevelopment, at time of East Edge Visual Study, showing vegetation in Kyngmount Park

Group of Eucalypts in south west corner of 229, the only “stand” of Eucalypts on the site

Figure 5: Landscape Site Analysis
Base: (© Department of Lands aerial photograph. Six Viewer)

Row of pines on northern side of No. 229, of low significance.

Highly significant pine trees on Eagleview Road frontage and significant brush box trees in driveway of No.221

Taller eucalypts in rear of No. 225 create soft ridgline when viewed from sub-regional distances. These trees were planted by current owners.

4.0 EXISTING VISUAL ENVIRONMENT

4.1 REGIONAL AND SUB-REGIONAL SETTING

The proposed residential site is located on the eastern edge of the Campbelltown valley.

Regional and sub-regional views from the site are possible in the following directions:

- Limited views towards the east across Minto Heights to the bushland of the Holsworthy Field Firing range. Expansive views are likely from the second storey of number 27.
- Panoramic views across the Campbelltown valley to the Scenic Hills beyond, from the south-west with the Australian Botanic Gardens 8.5km away to the un-named hilltop along Raby Road, and towards Denham Court in the north-west, both 6km away.

Sample views to the site were taken from publicly accessible areas in Raby. The site was able to be identified due to its proximity to the earth scar that is the Minto renewal area under development, the newly grassed steep section of Kyngmont Park, the tall pines on Eagleview Road at the northern end of the site and the open sloping lawn in front of 229 Eagleview Road, with the house visible backed by pine trees.

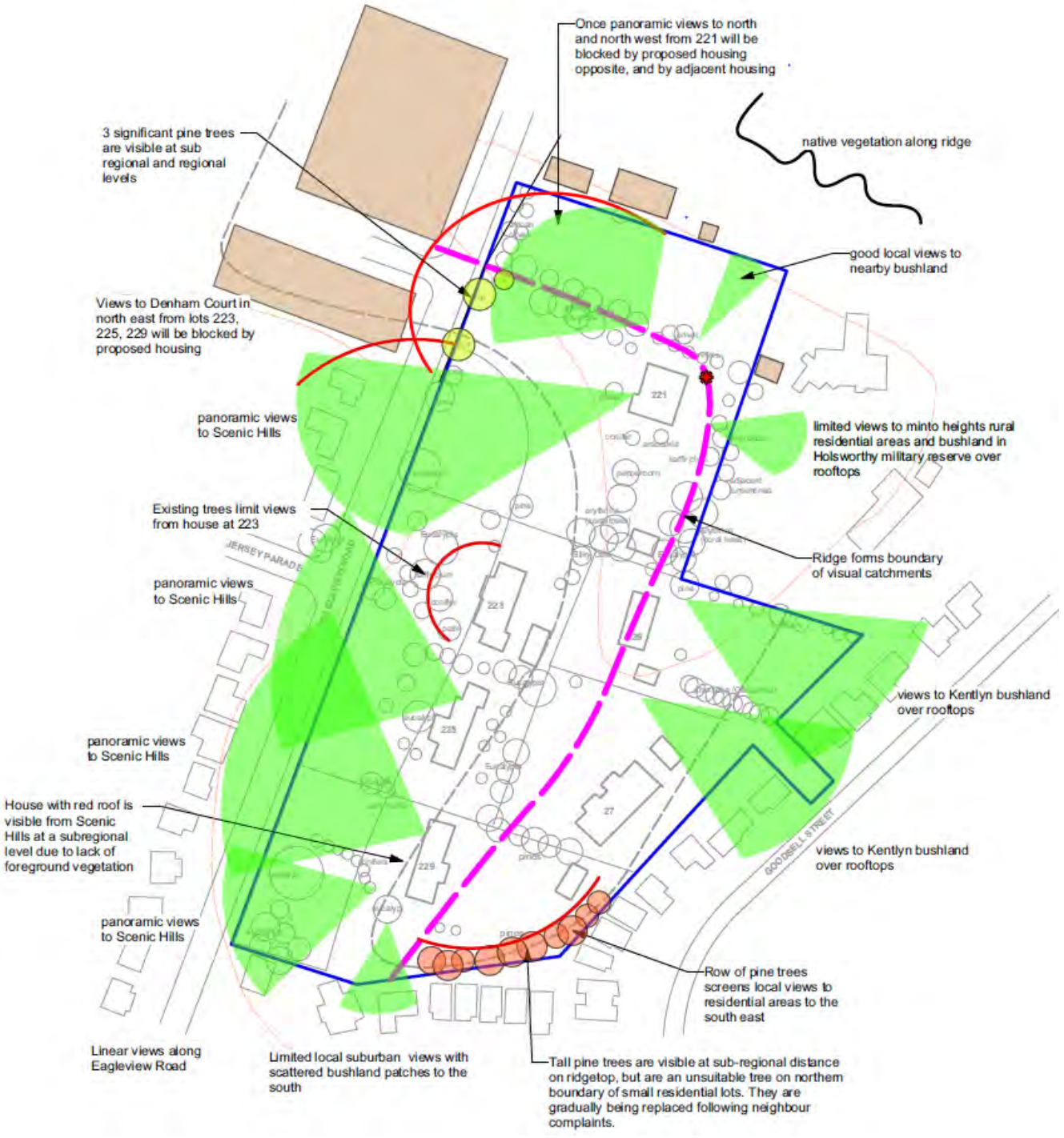


Figure 6: Landscape View analysis

Panoramic views from No. 225 southwest to Badgally Hill, and west to Scenic Hills.

Panoramic views from the site ridgeline outside gate of No. 221, west to Scenic Hills and north-west to Denham Court, shortly to be lost due to housing in Minto Redevelopment Project

View from service station at eastern end of Raby Road, toward site, with Pine trees at No 221 visible on horizon at the highest point of the ridgeline in centre of the view. Intervening trees at Campbellfield Public school block more extensive views to site.

View to mature pines at gateway of 221 Eagleview Road from new housing within the former Kyngmount Park. Two storey houses under construction on the ridgeline will adversely affect views from the site.

Enlarged view to site from Raby Road ridge in the Scenic Hills, 6km away, showing the 3 pines on intermediate ridge, backdropped by bushland in Holsworthy Rifle Range. Kyngmount Park is visible as a green open slope in front of the pines. New housing will be built along this ridgeline above the park. The red roofed house to the south (right) along the ridgeline, backdropped by the row of darker pines, is number 229 Eagleview Road. No other houses on the site are discernible from this viewpoint. The importance of the soft ridgeline created by vegetation is obvious in this view as skylining houses to the north in the Minto Redevelopment area detract from the view. Existing trees on site soften the ridgeline. The grey or brown rooves are less visually dominant. View was taken on a smoggy day, and would be clearer on other days.

4.2 LOCAL SETTING - VISUAL USAGE

The site is set on a ridge amongst a suburban residential area. It forms a distinct landscape compartment, not visible locally beyond the adjacent housing and immediate section of adjacent Eagleview Road. The battle- axe lots (25-27 Goodsell Street) are not visible at all from the surrounding streets.

Eagleview Road

The southern section of Eagleview Road is a suburban residential area with a suburban character, with house lots minimum 450m2 on either side of Eagleview Road. Further to the north, adjacent to the site, the suburban character continues. Due to the enclosing landform, the site itself is only visible to the section of Eagleview Road immediately fronting it, with small lot housing opposite. The development of housing in the Minto Renewal area to the north emphasizes the suburban character of the area.

The character of the site is suburban, with some parkland character where there are native and deciduous trees in the 40m setback. The view to the west of the site to the older suburban areas of Eagleview Road is of low visual quality. The view to the site is of moderate visual quality, lower where there are no intervening trees between house and street frontage, and higher where there are.

Goodsell Street

Goodsell street is a residential area characterized by small brick veneer, mostly single storey project homes, set in grassland with few scattered taller trees. Cocos palms are the dominant tree is this area. This section of Goodsell Street is of low visual quality.

The site is visible up the battleaxe driveway as a glimpse between houses, and the she-oaks in the driveway of number 27 block views to the houses. From the southern end of Goodsell Street, the tops of the Radiata pines in number 229 and the she-oaks are visible above the rooves of the single storey houses.

The land is gently sloped and there is little sense of a ridgeline beyond the houses as views in this section of Goodsell Street are very linear, along the road only.

Figure 7: View shed from local roads to site.

View from the corner of Goodsell Street and Cochrane Street showing backdrop of pines within No.229 Eagleview Road. Cocos palms have been the predominant vegetation planted in this residential area. Source: Google Maps

View to ridgeline from driveway of 223 Eagleview Road looking north. New houses in Minto Redevelopment area will skyline at ridge. Mature pine trees and Eucalypts provide significant scale and edge to view.

View to Minto Redevelopment area from gate of No. 221, towards Ben Lomond Road

View to south from 229 Eagleview Road showing adjacent residential areas. Large pine trees on site are shading neighbours, and are an inappropriate planting for the scale and proximity of the adjacent dwellings. Views to south are suburban and local only, of low visual quality.

View from 223 towards Minto renewal area

View from No.221 to significant bushland to the north-east in nearby 215 Eagleview Road

View from houses in Goodsell Street to east across rooftops to bushland in Kentlyn and Holsworthy Military area. A future Georges River Parkway is unlikely to be visible from the site due to intervening suburban housing.

5.0 SIGNIFICANCE OF THE EXISTING VISUAL ENVIRONMENT

The significance of the site is determined by evaluating the importance of the visual resource to the setting. Previous planning studies and reports were reviewed.

Visual integrity was also considered. The higher the existing environmental modification, the lower the visual integrity of the setting is likely to be.

5.1 Recommendation of Report "Natural Conservation Values Assessment –The Edge Scenic Protection Lands, Campbelltown"

Study prepared for Campbelltown Council by Conacher Travers in 2003, 2004, with recommendations reported in "Future Planning Directions for the East Hills Scenic Protection Lands" prepare by Campbelltown Council Manager of Environment and Planning.

Extract from Report:

In 2003, Conacher Travers were engaged by Council to undertake a "Natural Conservation Values Assessment – The Edge Scenic Protection Lands, Campbelltown". This study was further augmented in 2004 to include additional land and data. The study was based on field work. It identified areas of significant vegetation and environmental sensitivity and provided detailed information on flora and fauna for much of the land that comprises the Edge Lands. The study made recommendations relevant to Council's current considerations for future planning for the Edgelands. These included:

- *All areas of native vegetation should be retained where possible (including within private allotments). The areas given a conservation value of medium or high should be retained and buffer zones of various widths should be provided,*
- *Where possible, individual native trees should be retained (including retention within future private allotments),*
- *Applications for subdivision on land that has medium and high conservation value should be accompanied by a vegetation management plan,*
- *Additional targeted flora and fauna survey should occur within any area proposed for future development that have been assigned conservation values of medium or high. This is to provide more detailed assessment in the affected areas as opposed to the broad scale survey,*
- *The existing bushland areas that are part of existing corridors along Myrtle Creek and Peter Meadows Creek should be protected as part of any future development. Appropriate buffers should be protected for these areas, and*
- *The potential for areas to be revegetated, or existing degraded bushland areas to be regenerated to form corridors between existing remnants, should be considered in any future development rezoning proposals.*

5.2 Visual Analysis of Campbelltown's Scenic Hills and East Edge Scenic Protection Lands (East Edge Visual Study)

Report prepared for Campbelltown City Council by Paul Davies Pty Ltd in association with Geoffrey Britton. "5.4 East Edge Scenic Protection Lands (E-LU4) Eagleview Road" dated October 2011.

The site forms a large part of the southern most tip of the largest unit in the East Edge. The site is within the area zoned E4 Environmental Living, with lots to be 0.4 hectares minimum.

Extract from Report:

5.4.3 SUMMARY OF LANDSCAPE QUALITIES AND VALUES – E-LU4
E-LU4 demonstrates a range of landscape qualities and values from large-lot residential sub-precincts with little rural scenic quality to high quality bushland and traditional rural fringe landscapes of small holdings with modest houses in association with rural activity (such as market garden or the small-scale grazing of livestock).

Eagleview Road follows the highest ridgeline of the eastern side of the Campbelltown Valley, and the landscape falling away on either side ensures that it plays a prominent part in

directing the quality of the Unit's scenic and visual values. The undulating topography falling away from the ridgeline of Eagleview Road adds interest to the landscape and enhances the sense of scale within the Unit by creating a series of suburban/semi-rural sub-precincts.

The landscape units within ELU-4 that are relevant to the subject site are:

LARGE-LOT RESIDENTIAL CHARACTER (NORTH-WESTERN AND SOUTHERN EDGES OF THE UNIT)

- *Smaller lots than remainder of Unit*
- *Location on western side of ridgeline has allowed panoramic views over the Campbelltown valley to the Scenic Hills*
- *Large houses situated on lots to take maximum advantage of the views*
- *Glimpses of view available between dwellings in adjacent suburban development and where local road layout creates opening*
- *Suburban character – composition of houses, gardens and fences*
- *Does not read as transitional density or land use.*
- *Examples at the southern end of the Unit are more successful in demonstrating transitional landscape qualities – the prevailing house design is modest and their position on the lots imparts a greater spaciousness to the views.*

AREA OF CHANGE (MINTO RENEWAL PROJECT)

- *Cleared for redevelopment during period of inspections*
- *High-quality panoramic views available over the area to the Scenic Hills – these will be significantly compromised when development occurs – will change character to directed views between houses, garages, outbuildings and fences*
- *The development in this area also has the potential to have a significant impact on the scenic quality of views towards the Unit from the Scenic Hills*

The 0.4 hectare minimum zone has facilitated development that 'reads' as semi-urban, or large-lot residential in its aesthetic character. This is consistent with the objectives of this zone, but has not preserved the traditional rural/bushland landscape. The impact of this density of development on the visual qualities of the remainder of the area is currently intensifying with the construction of many new dwellings within and adjacent to the Unit (part of the Minto Renewal Project).

The main ways in which an effectively large-lot suburban density such as 0.4 hectare can protect the aesthetic values of a sensitive landscape is by ensuring that sufficient undeveloped and deep-soil areas remain available (and used) for the planting and maintenance in perpetuity of large-canopy eucalypts and other native vegetation to both lessen the impact of the residential development and to ensure that:

- *the ridge-lines of the area remain 'soft' in character when viewed from a distance (including from the valley floor and from the Scenic Hills);*
- *that the visual impacts of the houses and outbuildings are softened in internal views from within the area; and*
- *that the natural vegetation remains the prominent and defining physical characteristic of the landscape Unit.*

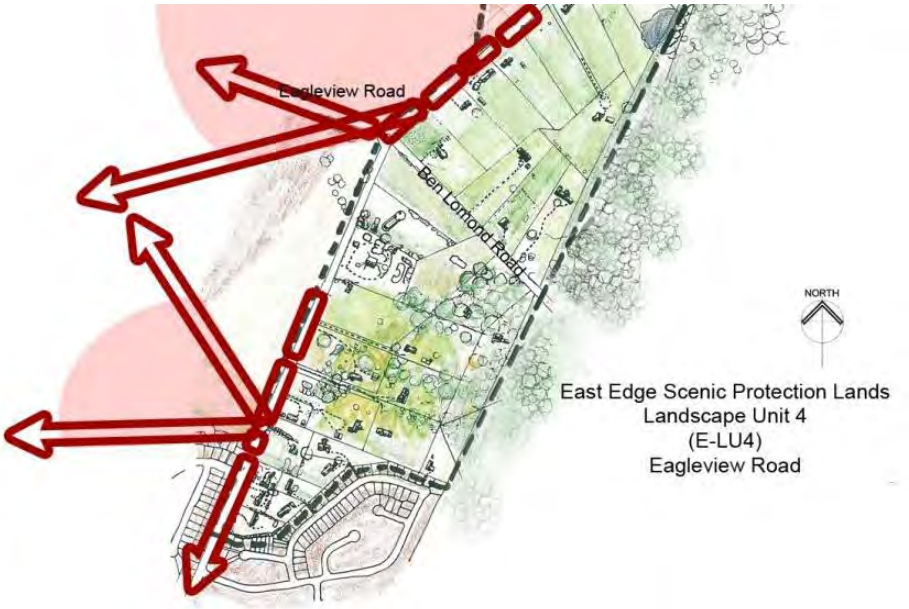


Figure 8: Figure 5.4.106 from Visual Analysis – East Edge shows vistas from from Eagleview Road in front of 221, to Scenic Hills. These views to the west and north-west will soon be blocked by the multi-storey ridgetop housing development between 221 and Ben Lomond Road on the western side of Eagleview Road.

P49:

Two issues are of particular importance in the design and management of the urban edge of the EESPLs: the need to protect the soft character of the ridge when viewed from the main valley and Scenic Hills to the west; and the integration of low-impact development with the environmental and aesthetic values of the bushland edge of the Georges River catchment area to the east.

The protection of the ridgeline quality requires that any structures be set on the eastern side of the ridge and that their height needs to be restrained to ensure that hard edges of buildings are not visible in views towards the ridge.

It is also important that the site is deep enough or is buffered by land dedicated to the growth of tall trees characteristic of the bushland landscape such as Eucalyptus tereticornis, or Forest Red Gums which will grow to a good height and provide a soft edge to the views. This species is appropriate in the EESPLs, being historically dominant in the Campbelltown area, tall-growing and capable of creating/maintaining a high-quality ridgeline in distant views without blocking local views from the area to the Scenic Hills.

This planted ridgeline protection area needs to be deep enough to allow the canopies to overlap so that they 'read' as natural in views towards the ridge and to ensure that any tree deaths in the future do not create a gap in the canopy line. In this regard it is important to note that the comments earlier in this study about the potential impacts of contemporary trends for two-storey houses with small setbacks and minimal areas available for soft landscaping on the quality of views towards and outwards from an aesthetically sensitive landscape are also relevant in the EESPLs.

At the time of preparation the ridge immediately to the west of Eagleview Road at Minto had been cleared for the Minto Renewal Project and spectacular views were available along the length of this part of the road. The objectives of the DCP for this project include 'to ensure that the visual character of the 'green' ridge top is maintained through controls on development within the scenic protection

zone and to maximise access to existing views and vistas.' The published Street Tree Planting Strategy shows that Forest Red Gums are to be planted along the ridgeline roadsides.

The concluding reasons for reducing the residential lot sizes in this area, where ridgeline protection is the main reason for the current zoning, focusses on a soft ridgeline not being attainable on smaller lots:
The existing 4000m2 zoning has resulted in a semi-urban landscape; and any increase in density beyond this will increase the suburban character of the western half of the Unit. Although the quality of the ridgeline could potentially be protected through the generous planting of eucalypts (as is proposed in the Minto Renewal DCP); the smaller lot sizes and large-footprint, two storey houses popular in suburban development today, together with outbuildings and structures such as swimming pools; would be unlikely to provide enough deep soil for the growth and maintenance of trees able to grow higher than the houses. The competitive nature of view-seeking in these areas will also be likely to lead to the loss of trees in the public domain through deliberate removal or vandalism. An urban character similar to that found in Blair Athol would be likely; and would be a stark contrast in views towards the Unit from the Scenic Hills.

Any reduction of the minimum lot size in this part of the Unit will result in an increase in the density of bulky structures and the further loss of vegetation in this scenically vulnerable position and is not supported.

The report fails to consider other methods to retain a soft ridgeline, as tree retention within large private residential lots is only one method of ensuring a soft ridgeline outcome. A well designed subdivision with larger lots and building envelopes between trees, where significant trees contributing to the soft ridge-line are retained, and additional planting of ridgeline trees within public ownership and Council control would also achieve these outcomes. Similar dense ridgeline planting have occurred in the Minto Renewal project north of Ben Lomond Road. This style of subdivision would allow building controls such as roof colour and building form and heights to be addressed.

5.3 Future Planning Directions for the East Edge Scenic Protection Lands

(Report prepared for the Campbelltown City Council Planning and Environment Committee meeting 6 Dec 2011 by Manager of Environment and Planning)

The Report prepared by the Council summarised the land in ELU-4 Eagleview Road as follows:
This is a large landscape unit that demonstrates a rich diversity of scenic landscape character. The north-western area and southern-most tip are semi-urban or large-lot residential, whereas the north-east area reads as natural bushland, and is the location of significant stands of native vegetation of high and medium conservation value. There are also significant stands of native vegetation of high and medium conservation value towards the southern end of the unit, south of Ben Lomond Road. The central area is more rural in its character, with many recently constructed houses on open grassed slopes. The land to the west of Eagleview Road is currently being redeveloped as part of the major Minto Renewal Project.

It also identified the ridgeline as being of particular significance:
The ridgeline within this landscape unit is significant and both local and distant views should be protected from encroachment by any potential future development through the use of appropriate landscaping.

The subject site was identified as having the potential for greater residential density:

The southern-most tip of the landscape unit is more densely settled and is primarily large-lot residential. Some parts of this landscape unit may have the capacity to accommodate some limited increase in the density of development, although it should be noted that, due to the identified environmental and scenic landscape constraints (as discussed above), these opportunities are not evenly distributed. Some lots have no potential for increases in the density of development over that which is already permitted.

The application for rezoning of Numbers 223 and 225 into standard residential lots was discussed in the report, prepared in 2011 for Council:
The subject land has been zoned for environmental protection purposes since the 1970s. The decision to retain this land as part of the Edge Lands is likely to have been made due to the fact that the lots are located on a prominent ridge line. Each lot already contains a substantial dwelling. The availability of physical and social infrastructure in itself is not grounds to justify rezoning the land for residential subdivision and subsequent development. In many local government areas there are places where suburban development ends and the transition to land with a non-urban character begins. This transition area is often characterised by lots that are larger than standard residential lots and that have been designed to accommodate semi-rural or 'lifestyle' housing opportunities. Regardless of where this transition area is located, there will always be pressure from land owners in that area to allow the suburban area to expand outwards to include their land. If Council were to allow the subject land to be rezoned and subdivided for standard residential development, this would not resolve the issue of transition but would simply displace it, and risk creating a precedent. In light of the above comments, it is recommended that the contents of the correspondence from Mr and Mrs Ackerley and Mr and Mrs Russo be noted, but that Council not depart from the recommendations contained in the report on Future Planning Directions for the East Edge Scenic Protection Lands which was presented to Council on 13 December 2011. These recommendations were based on the findings of the Visual Study. In particular it is recommended that Council retain an environmental zoning and a minimum lot size of 0.4 hectare (4000m2) over the land that is currently zoned 7(d6). Planning and Environment Committee Meeting 3 April 2012 Page 30

The transition area argument is no longer relevant due to the very heavy density development that has occurred recently, and will occur, opposite the site. The subject site is an enclosed landform unit and not visible to rural landuse beyond as a transition area. It has a suburban character. It could be developed to retain some parkland character.

The precedent argument is no longer viable. The very dense development of the ridgeline opposite, with no backdrop of vegetation, has set a very poor precedent.

The options to achieve the retention of a soft ridgeline were not considered, as discussed in 5.2 above.

5.4 Local Visual Integrity – Contribution to Visual and Landscape Character of Unit E-LU4

The site is surrounded by suburban development on three sides. The ridgeline in this location has been severely compromised by the development of the houses on the ridgetop within the Minto Renewal area, immediately to the west across Eagleview Road. The site is enclosed by landform and surrounded by suburban development of low visual quality.

The well designed consistent housing with grey rooves, set amongst trees with bands of taller vegetation, parks and street trees provides a higher visual quality landscape than the housing in the 1980s suburban development surrounding the site.

The site's contribution to the landscape character of the locality is limited in extent to the immediate section of Eagleview Road fronting it. It provides an improved visual character to the adjacent suburban areas, with some parkland character. It is suburban rather than rural.

The site's primary value is in providing a soft ridgeline from sub-regional and regional viewpoints.

Its value as a transition between rural and suburban areas is limited by its location, being within a suburban area, enclosed by a ridgeline, with no adjacent rural landuses. It is not visible from areas within the unit that have a rural landuse. As urbanisation has occurred to the north-west, it has no transition value.

The clearing of native vegetation for asset protection zones is not relevant as the site is surrounded by suburban development.

The site is not a buffer between the long-proposed Georges River Parkway, as there is already suburban development to the east of the site, between it and the Parkway.

Existing parkland character on Eagleview Road frontage – Nos 221-225

6.0 VISUAL EFFECT OF THE DEVELOPMENT

6.1 Visual Character of the Development

The proposal is the development of residential housing on larger lots, however similar in character to the Minto Redevelopment area.

6.2 Visual Effect of the Development

A development proposal showing proposed lot and road layout has not been developed. Generally, however, an increase in the numbers of houses on the site could be accommodated within the guidelines and recommendations made in this report.

The western end of the site should be single storey to minimise impact on the rural and bushland areas of the east edge. Single storey houses are less likely to be seen behind the existing single storey houses to the north of the site.

Significant trees and Eucalypts (which will become tall trees) should be retained to minimise visual impacts from Scenic Hills. Bands of vegetation will also minimise impacts from Scenic Hills, and soften existing a d proposed impacts of two storey dwellings on the ridge in the adjacent Minto Redevelopment area. Rooves should be grey tones to minimise their sub-regional visual impact.

The parkland character could be retained on the lower portion of the site with an increased housing setback. A row of tall street trees could then be accommodated with the greater residential setbacks.

Pine trees that are significant, Eucalypts, Brushbox and Norfolk Island Pines (*Araucaria*) should be retained. Less desirable trees being coral trees, privet, wild olive, cocos palms, rows of radiata pines and conifers could be removed. Remaining parkland trees should be retained where possible to minimise the visual impact locally and sub-regionally.

A vegetation band on the ridge would backdrop houses and limit their regional visual impact.

A ‘parkland’ style residential subdivision design that minimises road lengths, minimises access driveways to Eagleview Road and limits removal of existing vegetation would provide the best visual outcome for the site. A central band of vegetation along the ridge, wherever it is located could contribute to the parkland character.

7.0 DESIGN RECOMMENDATIONS

The inclusion of these design recommendations in the development will ensure that any visual effects will be minimised.

- All existing significant trees within the development be retained wherever possible. This includes Eucalypts, brushbox and significant mature pines.
- A band of vegetation min 10m wide be provided at the frontage of No. 221 to minimise the new housing in the Minto Redevelopment area from sky-lining.
- A band of trees, min 10m wide along the ridgetop or at the edge of the “plateau” area on the ridgeline to be maintained to provide a soft ridgeline.
- A residential setback of min 15m on Eagleview Road to maintain parkland character on the sloping land.
- Eucalyptus tereticornis planting along Eagleview Road to replicate proposed planting to the north on Eagleview Road opposite the Minto Redevelopment Area.
- Rooves to be grey tones.
- Single storey buildings on north side of brush box avenue to prevent any visual impact on the east edge scenic zone to the north of the site.
- Building exclusion zones of minimum 7m to be set around vegetation bands to minimise damage to housing and complaints as trees grow tall and canopies spread.
- Low timber front fencing on Eagleview Road, or low retaining wall and hedge at southern end (where Eagleview Road is in cut), to reinforce the parkland character.
- Use of shared (rather than multiple individual) driveways along Eagleview Road frontage to minimise tree loss in the front setback and maximise numbers of potential street trees.
- Protect the significant pines from further damage by preventing roadworks within the tree protection zones. Any further service installation or footpath installation on this side of the street would jeopardise their longevity.

Significant pines at 221 Eagleview Road. No footpath or roadworks to be proposed in the vicinity of the Tree Protection Zones of the pines.

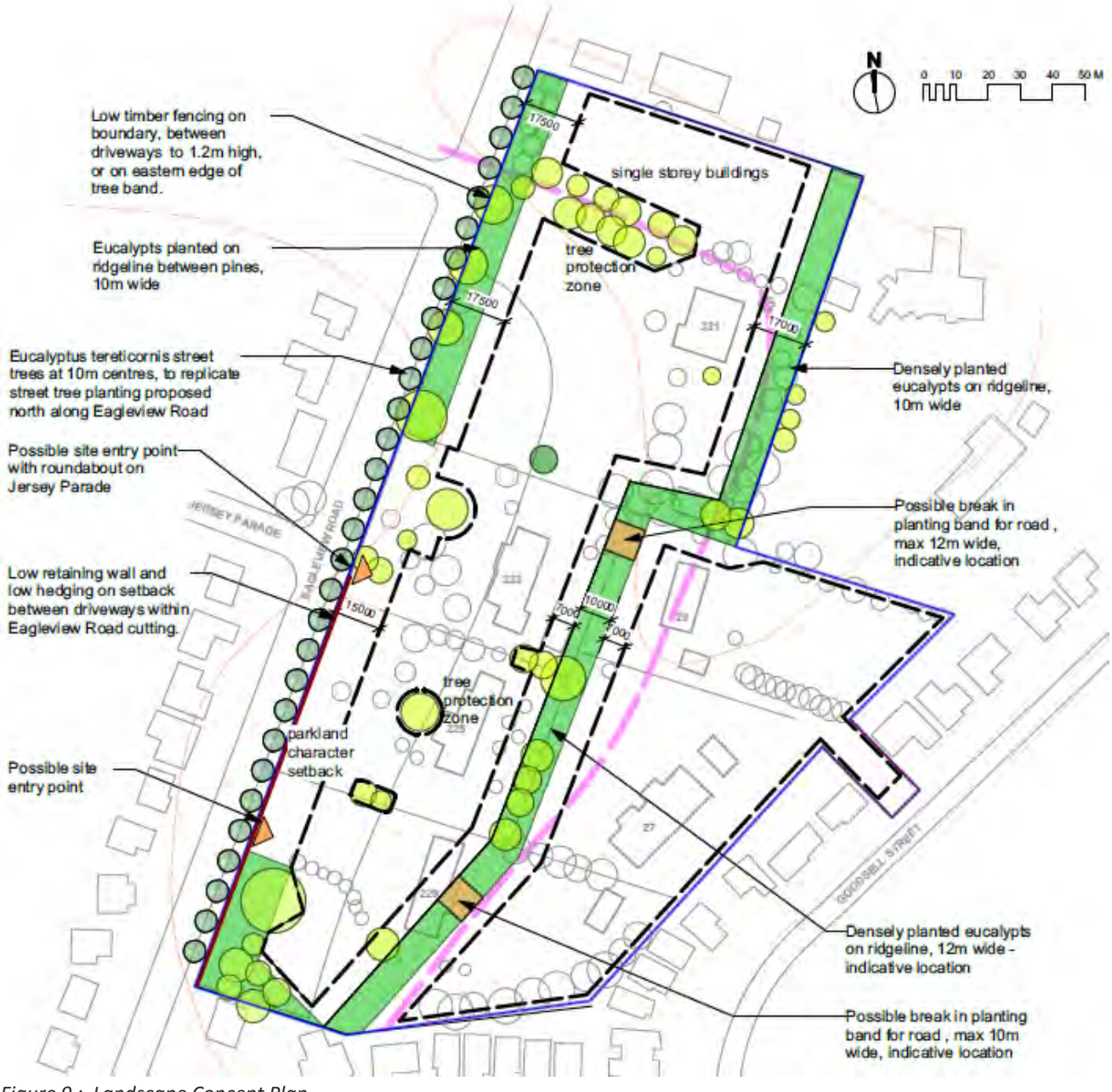


Figure 9 : Landscape Concept Plan

7.1 Suggested Planting List – Local native species

10m Canopy planting strips –

Plant as forestry tubestock with rabbit guards at 1/3m2, grown from seed collected in the local area.

Eucalyptus tereticornis

Eucalyptus punctata

Eucalyptus globoidea

Eucalyptus eugenioides

Eucalyptus fibrosa

Eucalyptus crebra

Screen planting strip, 8m wide, on ridge in Minto residential estate to the north of Ben Lomond Road along East Edge.

References

Paul Davies Pty Ltd in Association with Geoffrey Britten (Environmental Design Consultant) “Visual Analysis of Campbelltown’s Scenic Hills and East Edge Scenic Protection Lands” Part 5.5 East Edge Scenic Protection Lands (E-LU5) Hansens Road (October2011) unpublished draft.

Campbelltown City Council Reports of the Planning and Environment Committee Meeting 6 Dec 2011 “2.2 Future Planning Directions for the East Hills Scenic Protection Lands” Report prepared by Campbelltown Council Manager of Environment and Planning (2011) Campbelltown City Council website

Campbelltown City Council Reports of Planning and Environment Committee Meeting 11 October 2011 “2.5 Draft Visual and Landscape Analysis of The Scenic Hills and The East edge Scenic Protection Lands” (2011) Campbelltown City Council website

State Planning Authority of New South Wales. 1973 The New Cities of Campbelltown, Camden Appin : Structure Plan.

Wellings Smith and Byrnes. 1987. An Environmental Study to Determine Possible Future Controls on Development in the Scenic Protection Area Generally West of the Georges River Parkway.

Annexure 3 – Preliminary Traffic Study

Jeff Garry
Intersect Traffic Pty Ltd
February 2016

PRELIMINARY TRAFFIC ADVICE

RESIDENTIAL PLANNING PROPOSAL

LOTS 1, 2, 10 & 11 DP 719990, LOT 4 DP 539244 & LOT 100 DP 706378

221, 223, 225 & 229 EAGLEVIEW ROAD AND 25 & 27 GOODSELL STREET, MINTO

PREPARED FOR: TANGIBLE PLANNING SOLUTIONS

FEBRUARY 2016

REF: 16/004

PRELIMINARY TRAFFIC ADVICE
RESIDENTIAL PLANNING PROPOSAL
LOTS 1, 2, 10 & 11 DP 719990, LOT 4 DP 539244 & LOT 100 DP 706378
221, 223, 225 & 229 EAGLEVIEW ROAD & 25 & 27 GOODSELL STREET, MINTO

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This document has been prepared, checked and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
A	04/02/16	Draft	JG
B	11/02/16	Edit	JG
C		Final Proof	JG
D		Approved	JG

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SIGNATURE HAS BEEN REMOVED

This document has been authorised by

Date February 2016

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CONTENTS

ATTACHMENTS

PHOTOGRAPHS

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TABLES

1. INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by Tangible Planning Solutions to undertake a preliminary desktop traffic assessment for the proposed rezoning of Lots 1, 2, 10 & 11 DP 719990, Lot 4 DP 539244 & Lot 100 DP 706378 – 221, 223, 225 & 229 Eagleview Road and 25 & 27 Goodsell Street, Minto from an E4 Environmental Management zoning to an R2 Low Density Residential Zoning that would allow lot sizes down to 450 m^2 in area. The rezoning would allow the site to be subdivided with a potential lot yield of 26 lots all with frontages to existing road reserves. No new subdivision roads are proposed as part of this planning proposal. This traffic assessment is required to support a planning proposal to Campbelltown City Council.

The purpose of this document is to undertake a preliminary assessment of the likely traffic impacts of the proposal on the local road network and associated roadside infrastructure to allow Council to assess the merits of the planning proposal. The document will also advise Council and the applicant of the likely traffic issues that will need to be addressed should the proposal obtain a gateway determination.

2. DEVELOPMENT PROPOSAL

2.1 Site Location

The site is located on the eastern side of Eagleview Road between Eagleview Road and Goodsell Street Minto approximately 200 metres north of Westmoreland Street. ***Figure 1*** below shows the site location from a local context.

The site consists of six separately titled and addressed lots as described below and has an area of approximately 3.8 hectares.

- Lot 100 DP 706378 – 229 Eagleview Road, Minto;
- Lot 4 DP 539244 – 221 Eagleview Road, Minto;
- Lot 1 DP 719990 – 223 Eagleview Road, Minto;
- Lot 2 DP 719990 – 225 Eagleview Road, Minto;
- Lot 10 DP 719990 – 25 Goodsell Street, Minto; and
- Lot 11 DP 719990 – 27 Goodsell Street, Minto.

The site currently contains six residential dwellings (one on each lot) as well as a number of improvements and sheds. ***Photograph 1*** below shows the existing site conditions.

Each lot currently has a single urban standard access crossing to either Eagleview Road or Goodsell Street. 25 & 27 Goodsell Street currently access the road reserve via an access handle with separate driveways servicing each dwelling as shown in ***Photograph 2*** below.

Surrounding development to the east, south and west comprises low density residential dwellings while to the north land is characterised by large lot residential development.

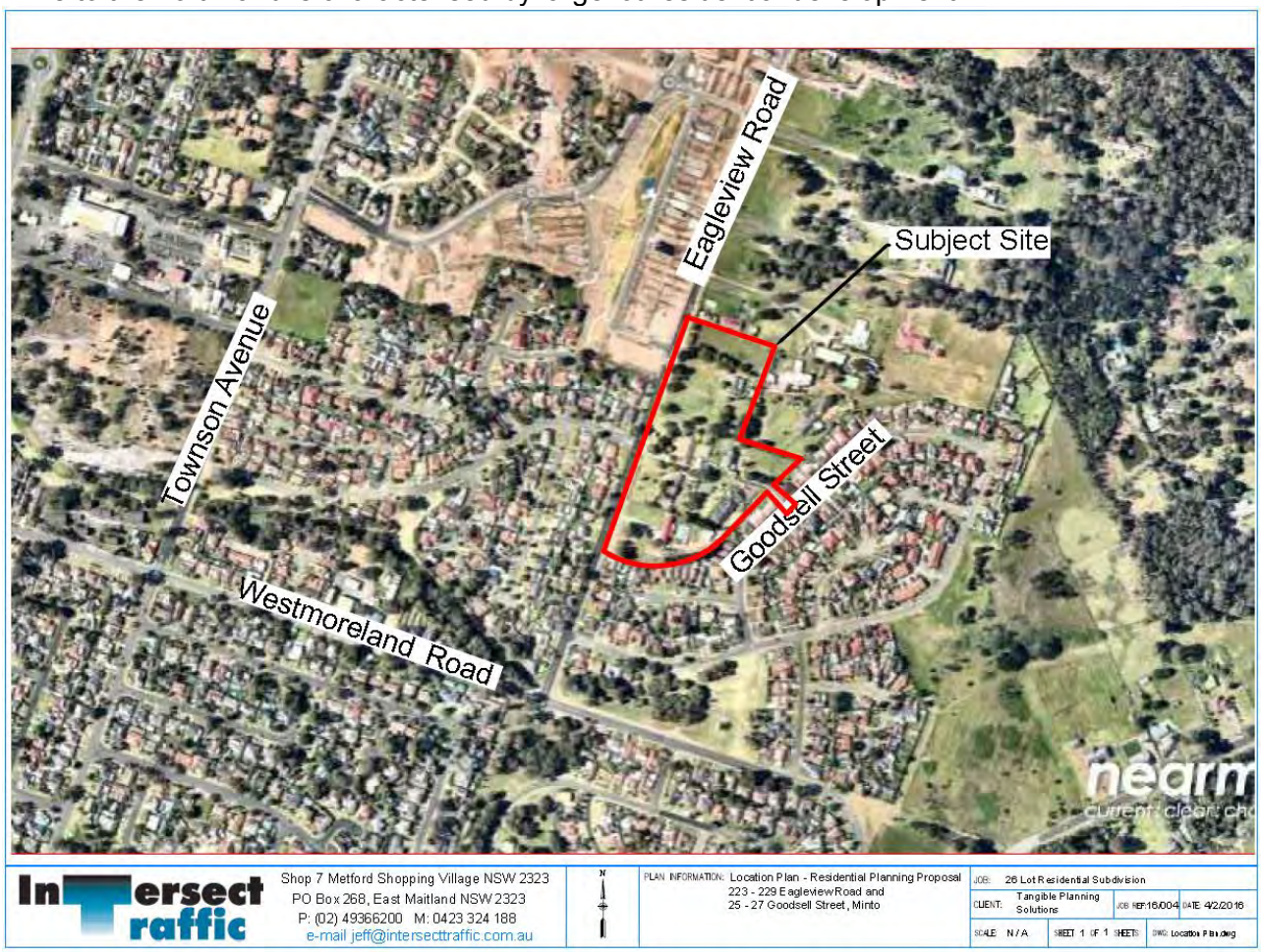


Figure 1 – Site Location

Photograph 1 – Existing site conditions.

Photograph 2 – Existing vehicular access to 25 & 27 Goodsell Street.

2.2 Development Proposal

The proposal involves the rezoning of the site from an E4 Environmental Management zoning to an R2 Low Density Residential Zoning that would allow lot sizes down to 450 m^2 in area. The rezoning would allow the site to be subdivided with a potential lot yield of 26 lots all with frontages to existing road reserves. No new subdivision roads are proposed as part of this planning proposal.

No preliminary concept plan was available at the time of preparation of this report. Once a gateway approval is provided a development concept plan will be prepared for further consideration and assessment during the future stages of the planning proposal application process.

2.3 Existing Road Network

In terms of the local road network, the roads that will be mainly impacted by the additional traffic generated by the development are;

- Eagleview Road;
- Goodsell Street; and
- Westmoreland Road.

These roads are all local urban roads providing a single travel lane in both directions with lane widths in excess of 3.5 metres. Eagleview Road and Goodsell Street both have kerb and gutter while Westmoreland Road has some kerb and gutter and in other areas has wide sealed shoulders and table drains. Typical carriageway widths are;

- Eagleview Road – 11 metres;
- Goodsell Street – 7.5 metres; and
- Westmoreland Road – 11.5 metres.

Eagleview Road and Goodsell Street under a functional road hierarchy are likely to be classified as urban local streets providing vehicular access to local streets while Westmoreland Road could be classified as an urban collector road collecting and distributing the local traffic to the sub-arterial road network. From the desktop assessment these roads appear to be in fair to good condition and a 50 km/h speed zoning exists through the area except at the variable school speed zoning site on Westmoreland Road west of the site. ***Photographs 3, 4 & 5*** below show these roads in the vicinity of the site.

Photograph 3 – Eagleview Road in the vicinity of the site.

Photograph 4 – Goodsell Street in the vicinity of the site.

Photograph 5 – Westmoreland Road in the vicinity of the site.

2.4 Traffic Generation

Traffic generation data for this preliminary assessment report has been sourced from the NSW Roads and Maritime Services (RMS') *Technical Direction TDT 2013/04* which provides the following specific advice on the traffic generation potential of low density residential dwellings.

Rates:

Daily vehicle trips = Average 10.7 per dwelling in Sydney.
PM peak (1) hour = 0.99 per dwelling in regional areas. (Maximum 1.39)
AM peak (1) hour = 0.95 per dwelling in regional areas. (Maximum 1.32)

Given the expected maximum lot yield from the proposal is 26 lots i.e. an additional 20 lots and adopting the maximum values for AM and PM peak hour generation the proposal is likely to generate the following traffic volumes onto the existing road network;

Daily vehicle trips	= 20 x 10.7	= 214 vtpd.
PM peak hour trips	= 20 x 1.39	= 28 vtph.
AM peak hour trips	= 20 x 1.32	= 26 vtph.

Note: - A more detailed traffic generation analysis will be carried out as part of the Traffic Impact Assessment report at a future stage in the planning process. This will accommodate any changes to the planning proposal as a result of further planning of the development and the adoption of a final concept plan.

2.5 Traffic Impacts and Considerations

2.5.1 Road Network Capacity

The capacity of the road network is generally determined by the capacity of intersections. However, Tables 4.3 and 4.4 of the RMS' *RTA Guide to Traffic Generating Developments* provide some guidance on mid-block capacities for urban roads and likely levels of service. These tables are reproduced below.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Further Table 4.6 of the RMS' *RTA Guide to Traffic Generating Developments* provides some guidance on environmental capacity goals for urban roads to ensure residential amenity in the area remains at acceptable levels. This table is also reproduced below.

Table 4.6
Environmental capacity performance standards on residential streets

Road class	Road type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

Urban road mid-block capacity and environmental capacity at the site is thus calculated based on these tables and assuming the following site specific variables;

- LoS C being considered satisfactory as local roads.
- They are undivided roads and each lane is considered an inner lane.
- Functionally Westmoreland Road is a collector road and Eagleview Road and Goodsell Street are local streets.

Utilising Tables 4.3, 4.4 and 4.6 of the RMS' *RTA Guide to Traffic Generating Developments* the respective capacities of the affected roads are as shown in ***Table 1*** below.

Table 1 – Road Network Capacity.

Road	Two-way mid-block capacity (vtph)	Environmental capacity maximum (vtph)
Eagleview Road	1,800	300
Goodsell Street	1,800	300
Westmoreland Road	1,800	500

In this location it is considered that the environmental capacities of Eagleview Road and Goodsell Street are the relevant assessment value while for Westmoreland Road the two way mid-block capacity would be relevant near Pembroke Road west of the site though environmental capacity may be relevant in the area near Eagleview Road.

The existing traffic volumes in the area have been estimated using RMS traffic generation rates as discussed in ***Section 2.4*** above and an assessment of the existing catchment for each road (no. of existing dwellings). Whilst relatively easy for the local roads it is a bit more problematical for Westmoreland Road due to the existence of schools and other developments along its length. The traffic volumes estimated in this preliminary assessment would need to be confirmed within a more detailed traffic impact assessment carried out later in the rezoning process with individual intersection counts during peak AM and PM traffic periods. The adopted (estimated) traffic data used in this assessment is shown in ***Table 2*** below.

Table 2 –Traffic volume estimates – local road network

Road	Catchment (lots)	PM peak hour (vtph)
Eagleview Road	150	200
Goodsell Street	75	100
Westmoreland Road	400	550

It has been assumed that 90 % of the new lots would access Eagleview Road and only 10% of the new lots would access Goodsell Street via private access handles and that all new traffic would utilise Westmoreland Road to access the higher function road network. The additional traffic volumes expected (critical PM period) on each road would be;

- Goodsell Street – 3 vtph;
- Eagleview Road – 25 vtph; and
- Westmoreland Road – 28 vtph.

Adding this additional traffic to the estimated existing traffic volumes results in the following post development traffic volumes on the local road network;

- Goodsell Street – 103 vtph;
- Eagleview Road – 225 vtph; and
- Westmoreland Road – 578 vtph.

In terms of Eagleview Road and Goodsell Street traffic volumes would remain below the environmental capacity goals for these roads as local streets (< 300 vtph) and would do so even with normal background traffic growth for a 10 year period.

It is also noted that the existing traffic volumes on Westmoreland Road particularly near Pembroke Road would already be above the environmental capacity therefore this capacity standard is no longer relevant and the mid-block two-way capacity would be a more relevant capacity assessment value. Again traffic volumes in Westmoreland Road post development and with normal background traffic growth over a ten year period would remain well below the technical mid-block two-way capacity therefore it is reasonable to conclude that the existing local road network has sufficient spare capacity to cater for the planning proposal.

Noting that the additional traffic generated by the proposal is also generally less than 10 % of existing traffic volumes it is reasonable to conclude that on its own such an insignificant traffic increase would not be expected to adversely impact on the wider road network.

A more stringent road network capacity analysis using recorded existing traffic volumes would be carried out in a future traffic impact assessment should this planning proposal proceed past gateway determination.

2.5.2 Intersection Capacity

No intersection capacity analysis has been carried out for this preliminary assessment. By observation intersections within the vicinity of the site are all operating with satisfactory levels of service with little or any delay and vehicle queuing occurring.

The addition of only up to 25 vtph on any section Westmoreland Road would not be expected to impact on the operation of these intersections particularly as the additional traffic on these intersections would represent less than 5 % of existing traffic volumes. This will be demonstrated through Sidra modelling of key intersections within a more thorough traffic impact assessment report undertaken at a future stage of the planning process.

2.5.3 On-site parking

The planning proposal is to allow residential development on the site and as such does not itself generate an on-site car parking demand. Future development of the land to provide residential dwellings will generate the on-site car parking demand and assessment of the proposed on-site car parking supply needs to be carried out at the development application stage for construction of the residential dwellings.

However the proposed subdivision will result in lot sizes will in excess of the minimum low density residential lot size of 450 m^2 and these are considered large enough to allow on-site car parking to be provided on each lot in accordance with Campbelltown City Council's DCP requirements for at least a single dwelling house.

2.5.4 Public transport & alternate transport modes

As a residential planning proposal the development has the potential to increase public transport usage as well as external pedestrian and bicycle traffic. However the scale of the development is relatively small therefore the increased public transport usage and alternate transport mode traffic increase is not likely to be significant. Therefore improvements to infrastructure and public transport services are unlikely to be warranted.

Public transport in the area is provided by Interline Bus Services with Route 881 (Campbelltown to Leumeah North Loop) being the most convenient though Routes 870, 871 and 872 (Campbelltown to Liverpool services) also pass within convenient walking distance (670 metres) to the site. Route maps for these routes are provided in ***Attachment A***. There are bus stops with shelters and seats located immediately south of the site on Westmoreland Road (see ***Photograph 6*** below). There would not be sufficient additional demand within the proposal that is likely to require a change to the current public transport service.

There is little in the way of existing concrete pedestrian footpaths along Eagleview Road, Goodsell Street and Westmoreland Road (isolated sections only) with pedestrians currently using the grass verges or sharing the road shoulders/edges with all vehicles. The additional pedestrian demand from the development would not be expected to be such that it will require construction of new pedestrian footpaths in the area aside from the current requirements of Campbelltown City Council in regard to the site frontages.

Cyclists in the vicinity of the site are generally required to utilise the sealed shoulders or share travel lanes on all the local roads in the vicinity of the site. Again this is considered suitable for the level of additional demand generated by the proposal.

A more detailed assessment of alternate transport mode impacts will need to be carried out within the traffic impact assessment that is likely to be required at development application stage.

Photograph 6 – Bus Stop & Shelter – southern side of Westmoreland Road.

3. CONCLUSIONS

This preliminary traffic assessment for the proposed rezoning of Lots 1, 2, 10 & 11 DP 719990, Lot 4 DP 539244 & Lot 100 DP 706378 – 221, 223, 225 & 229 Eagleview Road and 25 & 27 Goodsell Street, Minto from an E4 Environmental Management zoning to an R2 Low Density Residential Zoning has concluded;

- The existing local road network has sufficient spare capacity to cater for the planning proposal.
- The additional traffic generated by the proposal is less than 10 % of existing traffic volumes therefore it is reasonable to conclude that on its own such an insignificant traffic increase would not adversely impact on the wider road network.
- The addition of up to 28 vtph on any section of the local road network would not be expected to adversely impact on the operation of adjoining intersections particularly as the additional traffic on these intersections will decrease markedly as traffic on the road network is distributed through the various travel routes to the site and represents less than 10 % of total traffic volumes through the intersections.
- With proposed lot sizes well in excess of the minimum 450 m^2 for low density residential being sought in the planning proposal it is considered this is large enough to allow on-site car parking to be provided on each lot in accordance with Campbelltown City Council's DCP requirements for at least a single dwelling house.
- The proposal has the potential to increase public transport usage. However, the scale of the development is relatively small therefore the increased public transport usage and alternate transport mode traffic increase is not likely to be significant. Therefore, improvements to infrastructure and public transport services are unlikely to be warranted.
- There are bus stops with shelters and seats located immediately south of the site that is within convenient walking distance to the site and being within 450 metres of the extremities of the site.
- The additional pedestrian demand from the development would not be expected to be such that it will require construction of new pedestrian footpaths in the area aside from the current requirements of Campbelltown City Council in regard to the site frontages.
- Cyclists in the vicinity of the site are generally required to utilise the sealed shoulders or share travel lanes on all the local roads in the vicinity of the site. Again this is considered suitable for the level of additional demand generated by the proposal.

4. RECOMMENDATION

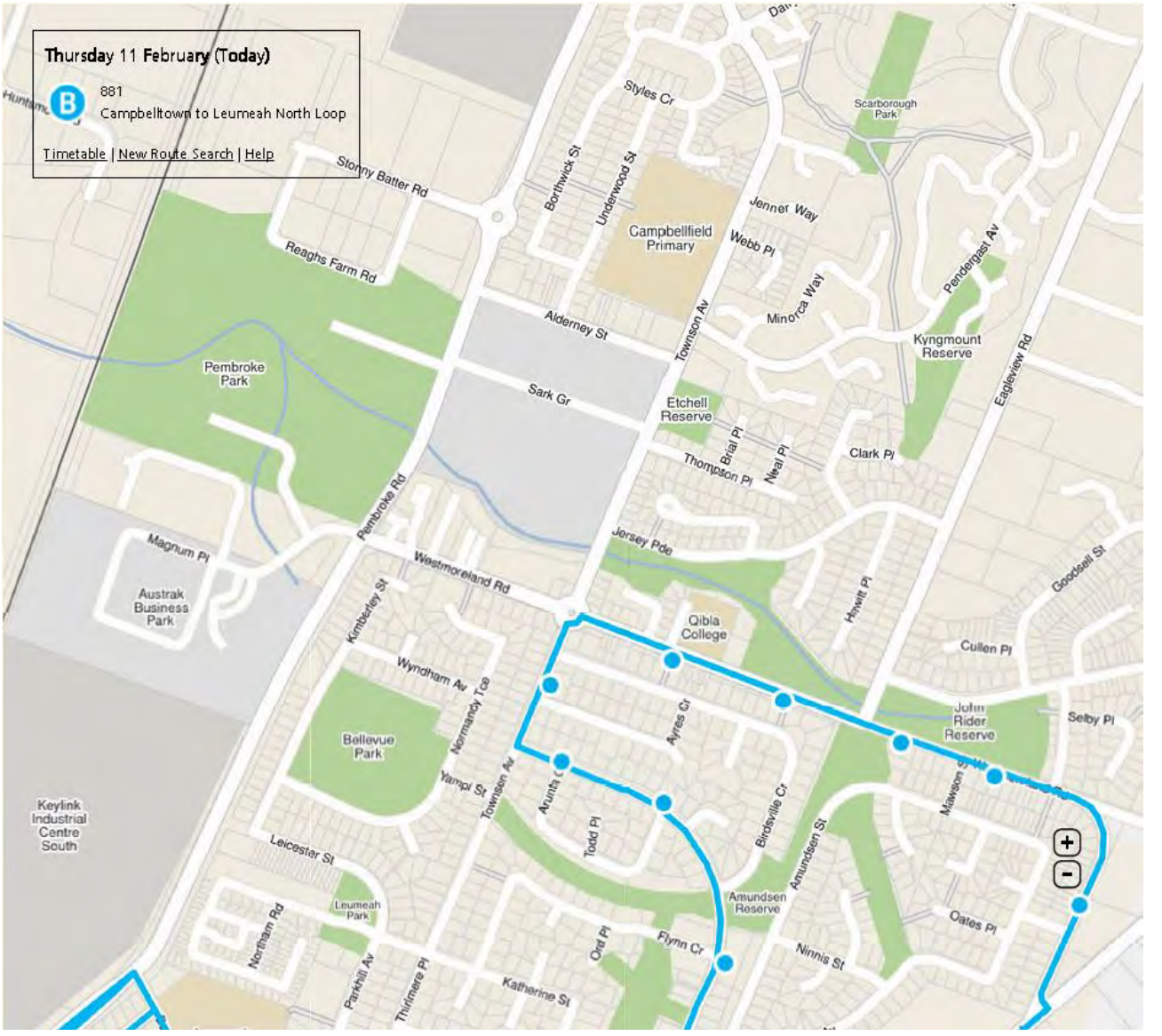
On the basis of this preliminary traffic assessment for the proposed rezoning of Lots 1, 2, 10 & 11 DP 719990, Lot 4 DP 539244 & Lot 100 DP 706378 – 221, 223, 225 & 229 Eagleview Road and 25 & 27 Goodsell Street, Minto from an E4 Environmental Management zoning to an R2 Low Density Residential Zoning it is recommended that the proposal can be supported as it is considered it would not adversely impact on the local road network and could meet all the requirements of Campbelltown City Council, RMS and Australian Standards.

SIGNATURE HAS BEEN REMOVED

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

ATTACHMENT A
BUS ROUTE MAPS

881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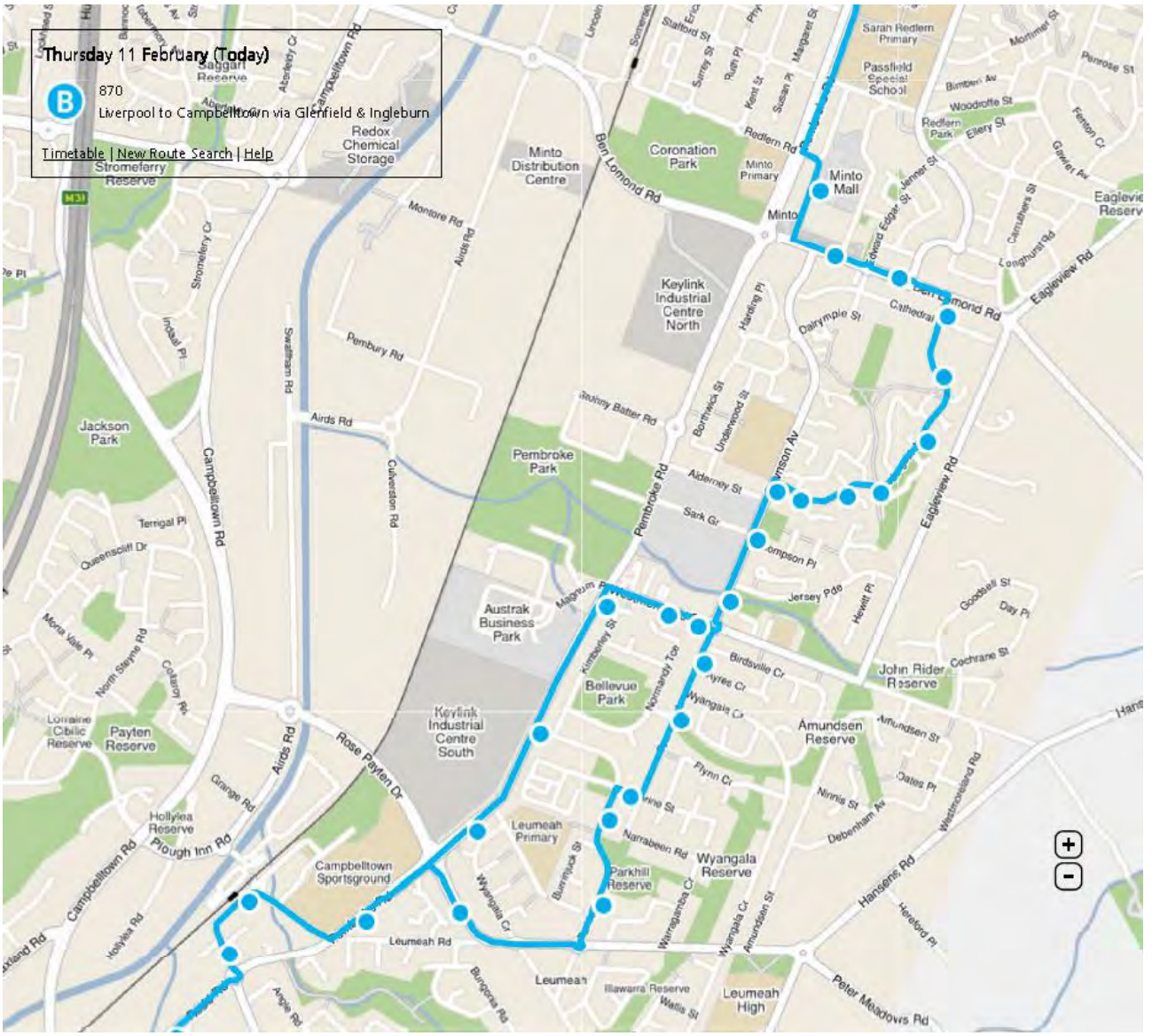
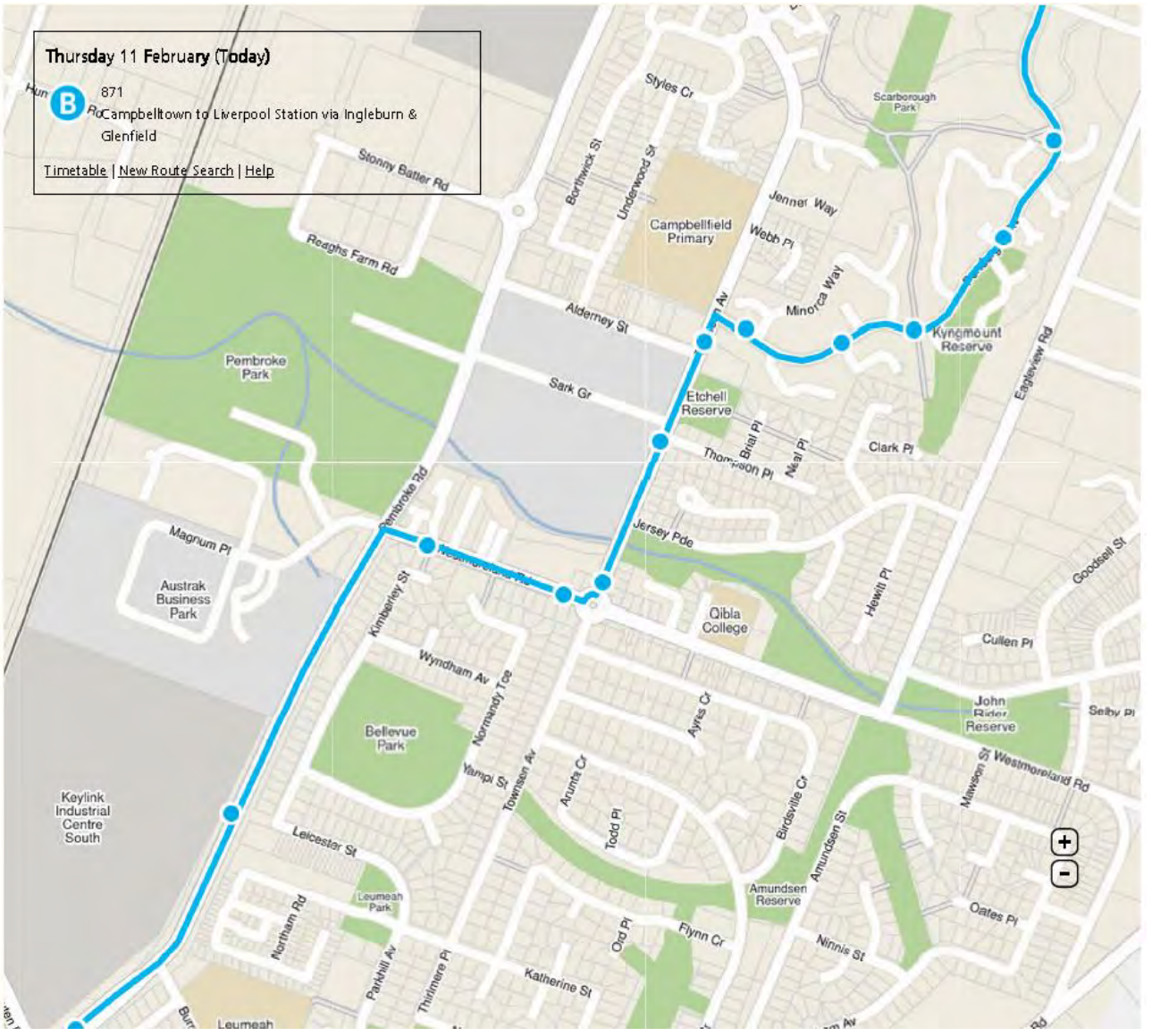
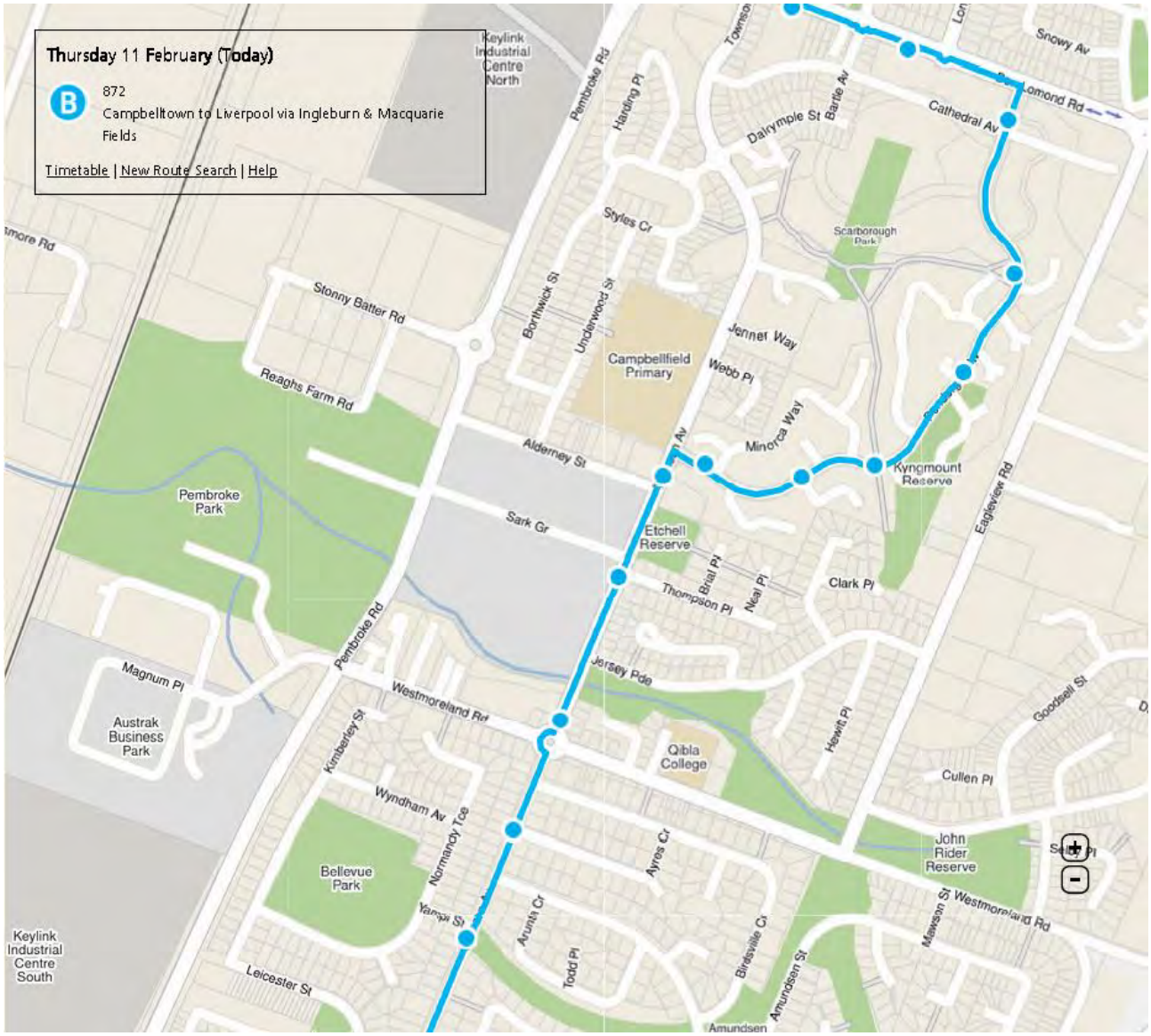
881
Campbelltown to Leumeah North Loop
Timetable | New Route Search | Help
Styles Cr
Scarborough Park
Stony Batter Rd
Borthwick St
Underwood St
Campbellfield Primary
Jenner Way
Webb Pl
Reaghs Farm Rd
Minorca Way
Pendergast Av
Alderney St
Townson Av
Kyngmount Reserve
Pembroke Park
Sark Gr
Eagleview Rd
Etchell Reserve
Thompson Pl
Brial Pl
Neal Pl
Clark Pl
Pembroke Rd
Magnum Pl
Jersey Pde
Austrak Business Park
Westmoreland Rd
Kimberley St
Hewitt Pl
Goodsell St
Qibla College
Cullen Pl
Wyndham Av
Normandy Toe
Ayres Cr
John Rider Reserve
Selby Pl
Bellevue Park
Yampi St
Townson Av
Arunta Cr
Todd Pl
Birdsville Cr
Mawson Dr
Keylink Industrial Centre South
Leicester St
Amundsen St
Amundsen Reserve
Leumeah Park
Northam Rd
Parkhill Av
Thirlmere Pl
Ord Pl
Flynn Cr
Oates Pl
Ninnis St
Katherine St

870


Thursday 11 February (Today)
B
870
Liverpool to Campbelltown via Glenfield & Ingleburn
Timetable | New Route Search | Help
Redox Chemical Storage
Stromeferry Reserve
Minto Distribution Centre
Coronation Park
Minto Primary
Minto Mall
Minto
Ben Lomond Rd
Keylink Industrial Centre North
Cathedral
Eagleview Rd
Jackson Park
Pembroke Park
Austrak Business Park
Keylink Industrial Centre South
Bellevue Park
John Rider Reserve
Amundsen Reserve
Wyangala Reserve
Parkhill Reserve
Leumeah Primary
Campbelltown Sportsground
Leumeah
Leumeah High
Illawarra Reserve
Payten Reserve
Hollylea Reserve
Lorraine Cibilic Reserve
Jackson Park
Airds Rd
Campbelltown Rd
Rose Payten Dr
Plough Inn Rd
Leumeah Rd
Hansens Rd
Peter Meadows Rd
Pembroke Rd
Eagleview Rd
Redfern Rd
Passfield Special School
Sarah Redfern Primary


Thursday 11 February (Today)
871
Campbelltown to Liverpool Station via Ingleburn & Glenfield
Timetable | New Route Search | Help
Styles Cr
Scarborough Park
Stonny Batter Rd
Bortwick St
Underwood St
Campbellfield Primary
Jenner Way
Webb Pl
Reaghs Farm Rd
Minorca Way
Alderney St
Kyngmount Reserve
Eagleview Rd
Pembroke Park
Sark Gr
Etchell Reserve
Briel Pl
Neal Pl
Clark Pl
Thompson Pl
Pembroke Rd
Magnum Pl
Austrak Business Park
Jersey Pde
Kimberley St
Qibla College
Hewitt Pl
Goodsell St
Cullen Pl
Wyndham Av
Normandy Tce
Ayres Cr
John Rider Reserve
Selby Pl
Bellevue Park
Vampi St
Townsen Av
Arunta Cr
Todd Pl
Birdsville Cr
Mawson St
Westmoreland Rd
Keylink Industrial Centre South
Leicester St
Amundsen St
Amundsen Reserve
Leumeah Park
Northam Rd
Parkhill Av
Thirlmere Pl
Ord Pl
Flynn Cr
Ninnis St
Oates Pl
Katherine St
Leumeah

872


Thursday 11 February (Today)
B
872
Campbelltown to Liverpool via Ingleburn & Macquarie Fields
Timetable | New Route Search | Help
Keylink Industrial Centre North
Pembroke Rd
Harding Pl
Dalrymple St
Bartle Av
Cathedral Av
Snowy Av
Styles Cr
Scarborough Park
Stonny Batter Rd
Reaghs Farm Rd
Borthwick St
Underwood St
Campbellfield Primary
Jenner Way
Webb Pl
Minorca Way
Kyngmount Reserve
Eagleview Rd
Alderney St
Pembroke Park
Sark Gr
Etchell Reserve
Briol Pl
Thompson Pl
Neal Pl
Clark Pl
Magnum Pl
Austrak Business Park
Westmoreland Rd
Jersey Pde
Kimberley St
Qibla College
Hewitt Pl
Goodsell St
Cullen Pl
Wyndham Av
Normandy Toe
Ayres Cr
John Rider Reserve
Bellevue Park
Mawson St
Aruma Cr
Todd Pl
Birdsville Cr
Amundsen St
Keylink Industrial Centre South
Leicester St

Annexure 4 – Water & Sewer Infrastructure Assessment

Australian Water Project Management
May 2016

Holeby Holdings Pty Ltd trading as
AWPM AustralianWater
project management

ABN 98 002 902 392
PO Box 1052 Narellan
NSW 2567
| **P** 02 4648 0666
| **E** wsc@awpm.com.au
| **www.awpm.com.au**

Date: May 4, 2016
Ref: AWPM/216000

Ackerley Plumbing
Attn: Steven Ackerley
P O Box 539
Ingleburn NSW 1890

Dear Steven,

RE: Proposed Subdivision Eagleview Road Minto

As Water Servicing Coordinators we have completed a preliminary review of this property, between Eagleview Road and Goodsell Street and confirm that the proposed subdivision into forty (40) residential allotments can be served by existing Sydney Water infrastructure.

Short of not knowing exactly what is planned, I assume that this may be 40 residential allotments with new road(s). Based on this, the following is assessed:

In Eagleview Road, there is a DN100, DN300 and DN375 watermain that will more than adequately cater for forty (40) additional allotments. Reticulation mains to service the allotments would be provided from the DN100 to provide single 25mm drillings for each allotment. There is also a DN100 in Goodsell Street which can be utilised.

There is currently a DN150 sewermain in Lot 1 & 2 DP 719990 (Eagleview Rd) which connects to a DN300 in Westmoreland Rd. There is also a DN150 sewermain in Lot 10 DP 719990 (Goodsell St) which connects to a DN225 in Cochrane Street.

Both sewer can be extended to provide a DN150 sewermain reticulation main for the proposed allotments. Each Lot must have a point of connection to the sewermain one (1) metre within the property boundary.

For a detailed assessment by Sydney Water, we could lodge a Feasibility Application to have them provide an initial planning response. Any proposed design works would require a Notice of Requirements to be issued by Sydney Water and these requirements accepted by sign the Developer Works Deed. The terms of the Deed define these extensions for Water and Sewer will be deemed as 'Major Works'.

We will need to lodge an application to Sydney Water via e-Developer for the issue of a Notice of Requirements to have the above mentioned required confirmed and a Major Works Developer Deed issued before any proposed extensions can be designed and ultimately approved by Sydney Water.

Should you have any queries, please don't hesitate to contact the undersigned.

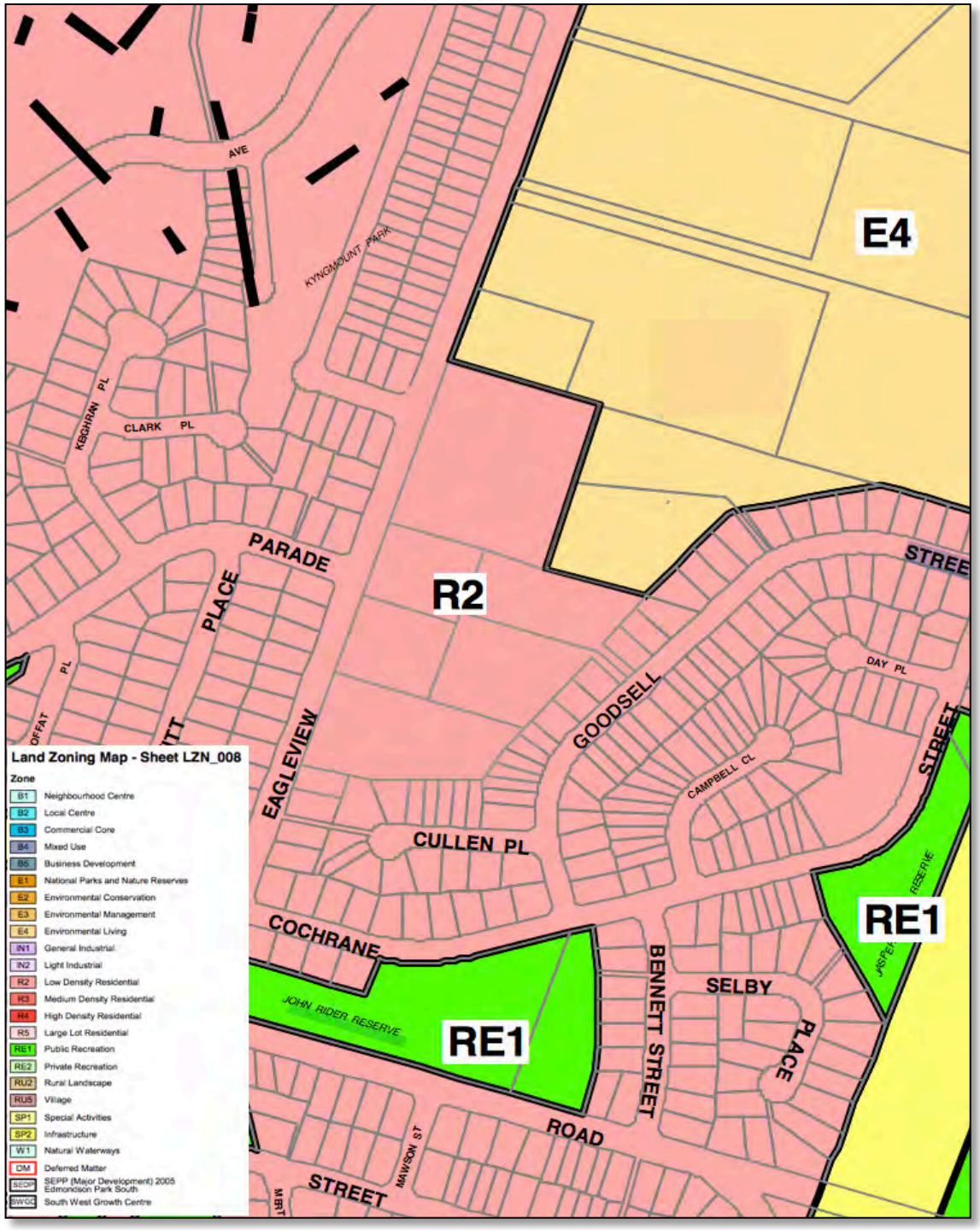
Yours faithfully

SIGNATURE HAS BEEN REMOVED

Jude Latimer
Designer
AWPM Australian Water Project Management

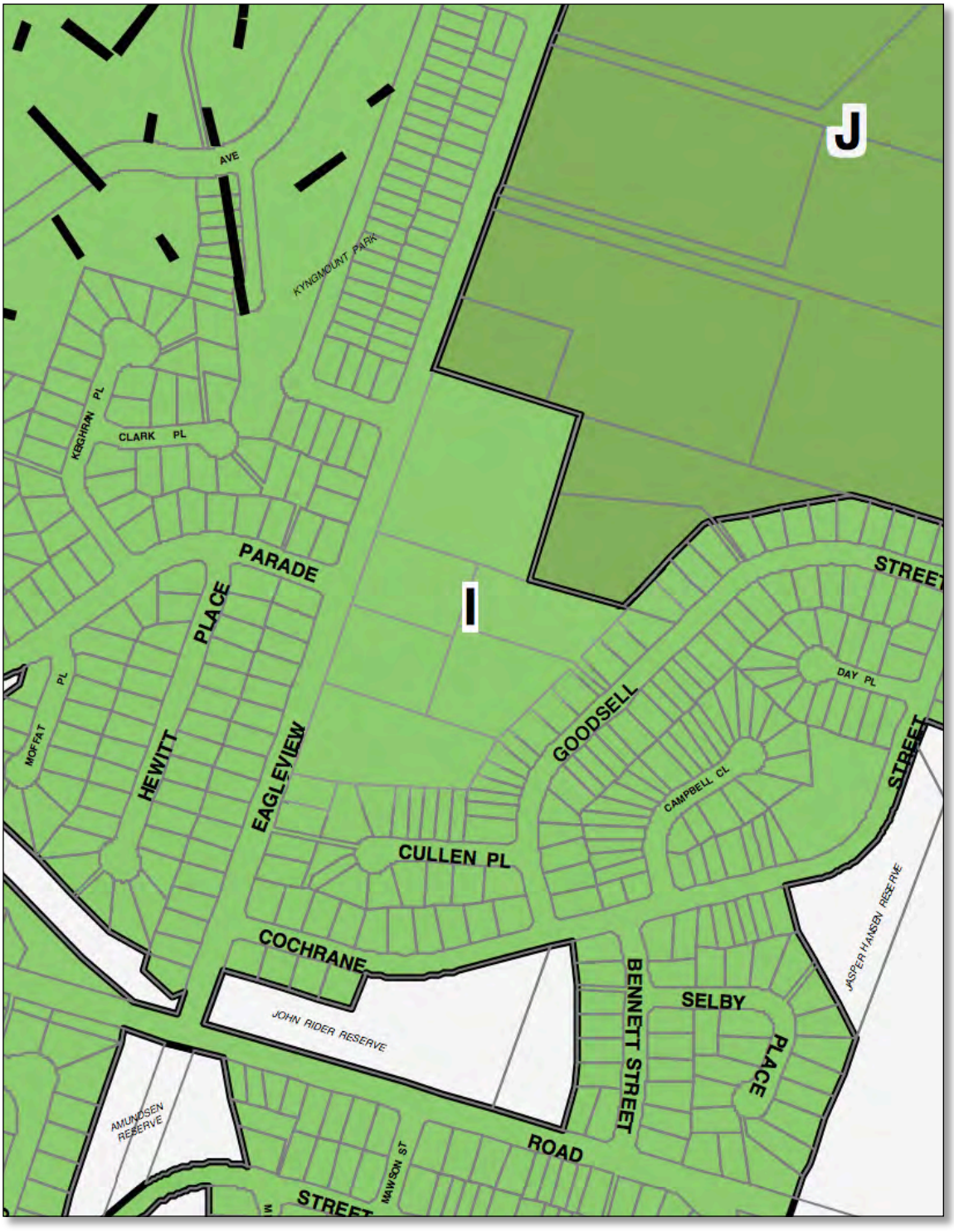
Annexure 5 – Zoning Map Amendment

Proposed amendment to LZN_008 *(1500_COM_LZN_008_020_20150428)*

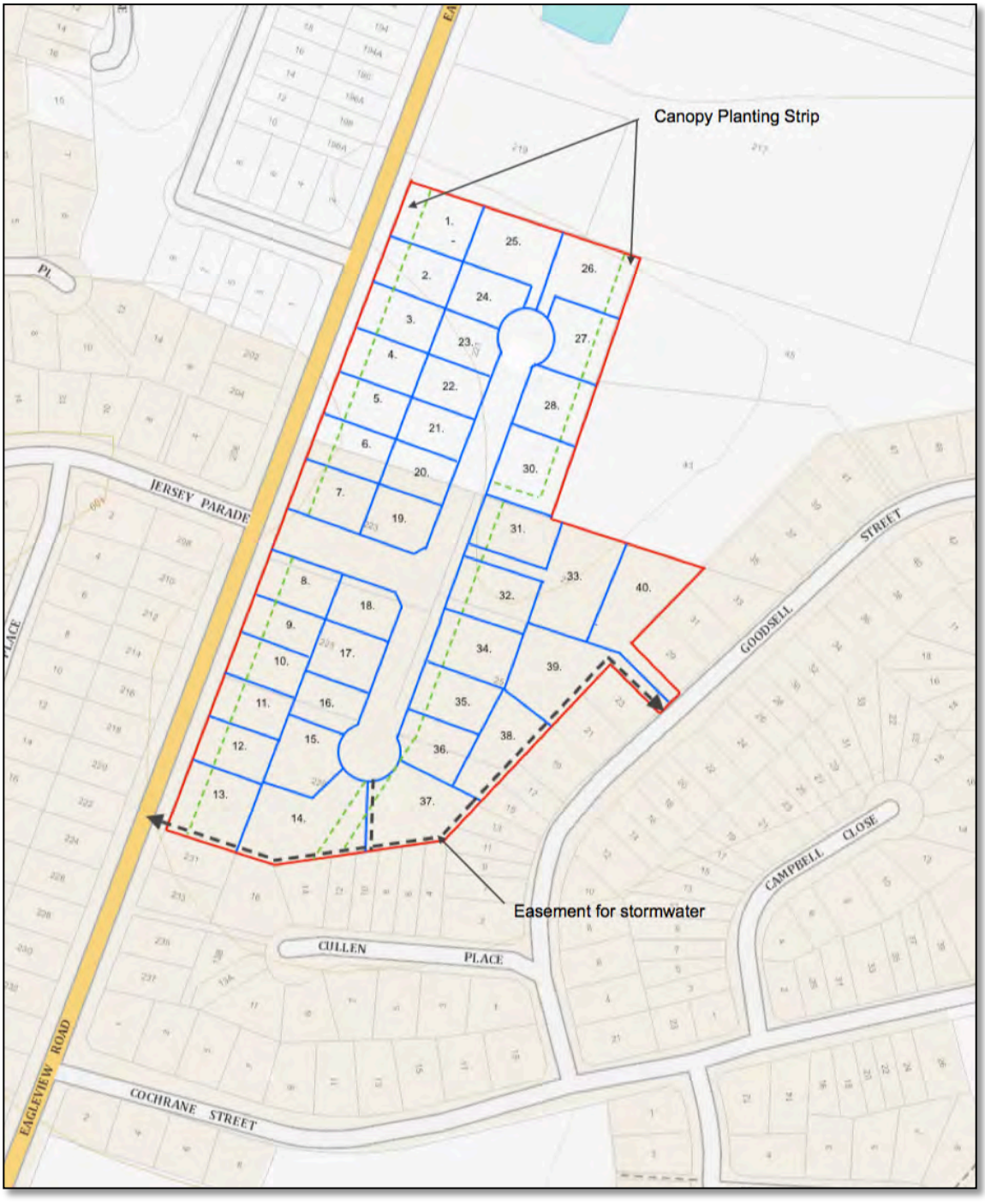


Annexure 6 – Minimum Lot Size Map Amendment (500m2)

Proposed amendment to LSZ_008 *(1500_COM_LSZ_008_020_20150428)*

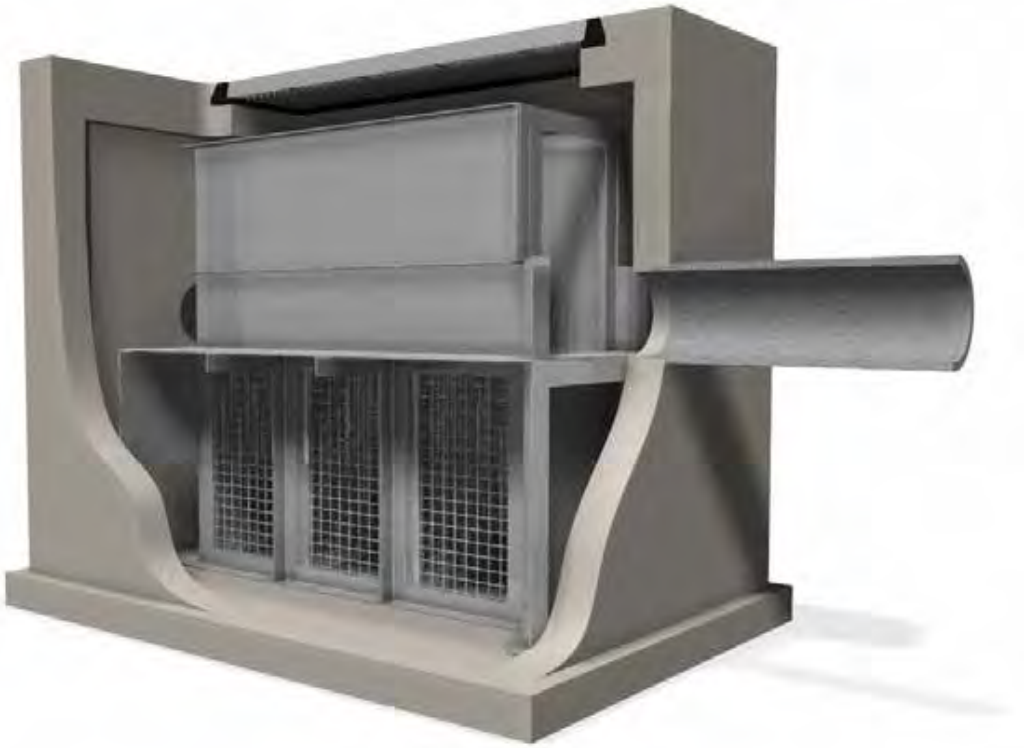


Annexure 7 – Concept Subdivision Design



Ecosol - Gross Pollutant Trap (GPT) Technical Specification

Ecosol™ Gross PollutantTrap Technical Specification



environmentally engineered
for a better future

Ecosol™
WASTEWATER FILTRATION SYSTEMS

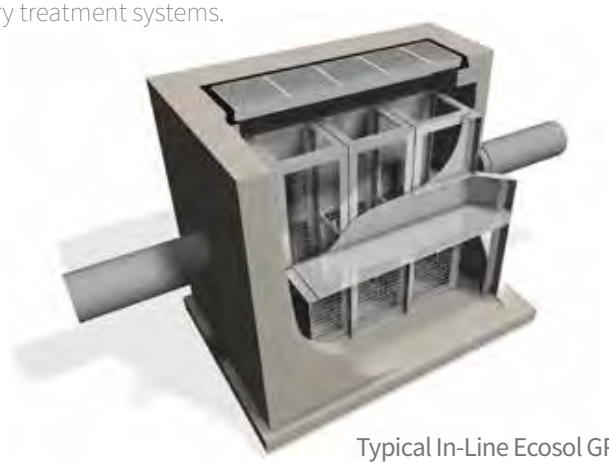
CONTENTS

CONTENTS continued

1.0 Introduction

Increasingly stringent environmental best management practice requires planners and developers to apply a fit-for-purpose treatment train approach to stormwater treatment to achieve today's water quality objectives (WQOs). An integral element to any good WSUD is primary treatment or pre-screening of stormwater flows to remove coarse sediment and gross pollutants prior to downstream secondary or tertiary treatment systems such as wetlands.

The Ecosol™ Gross Pollutant Trap provides effective primary treatment of stormwater flows thereby significantly enhancing the operational life of downstream secondary and tertiary treatment systems.



Typical In-Line Ecosol GPT configuration

Typical Off-Line Ecosol GPT configuration

The system has been designed to provide a robust and durable cost effective primary treatment system that captures and retains solid pollutants conveyed in stormwater conduits.

In developing this innovative stormwater treatment system careful consideration has been given to durability, longevity, cost and maintainability. Key commercial technical features include:

- low visual impact and energy footprint;
- designed hydraulics with proven performance and longevity;
- scalable design; and
- cost effective maintenance regime.

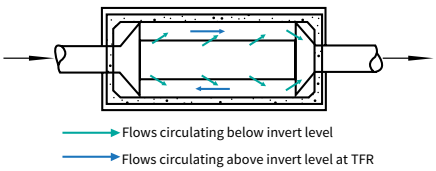
This technical manual describes the operation and performance characteristics of the system.

Ecosol™
WASTEWATER FILTRATION SYSTEMS

1.1 How and Why the Ecosol™ GPT Works

The objective of stormwater treatment is to achieve a real, visible and sustainable improvement in water quality. Pollution control measures, including Gross Pollutant Traps (GPT's), such as the Ecosol™ GPT, litter baskets, sediment basins, grass swales, infiltration systems and sand filters all reduce the level and concentration of a variety of pollutants, thereby enhancing water quality.

The Ecosol™ GPT is a non-blocking, wet sump, tangential filtration system that has been specifically designed to filter stormwater pollutants conveyed in stormwater conduits by capturing and retaining all contaminants larger than 2mm up to a designed treatable flow rate (TFR). It can play and integral role in reducing pollution in urbanised catchments and help reduce the footprint of a total stormwater treatment train by providing essential prescreening.



Developed in 1996 and tested by the University of South Australia and also EngTest the commercial consulting division of the Adelaide University it remains today one of the most widely recognised and used stormwater primary treatment systems. Today as part of our continual product improvement program the modern Ecosol™ GPT is designed to provide high pollutant retention rates with little hydraulic impact on the drainage infrastructure.

Two unique systems have been designed, the Low Flow Ecosol™ GPT for primary treatment of stormwater at low flow velocities and the High Flow Ecosol™ GPT for primary treatment of stormwater at high flow velocities.

1.2 Low Flow Ecosol™ GPT

The Low Flow Ecosol™ GPT has been designed and tested specifically to treat low flows to capture and retain fine particulates and hydrocarbons from stormwater. Its tangential screening along with its large detention chamber enables gravitational separation to occur at low flow velocities retaining fine particulate matter conveyed in stormwater providing essential primary treatment.

Key Features

- high capture efficiency of solids at low flow velocities;
- designed high flow by-pass capacity;
- Independently tested and verified by the University of Adelaide;
- designed hydraulics provides minimal hydraulic headloss;
- shallow depth below invert reduces water table problems;
- visually unobtrusive; and
- easily cleaned using eductor truck or removable lift out baskets.

1.3 High Flow Ecosol™ GPT

The range of High Flow Ecosol™ GPT's, are designed specifically to provide essential primary treatment of gross pollutants conveyed in stormwater at high velocities. Typically this system has been designed to capture and retain more than 99% of pollutants larger than 2mm.

Key Features

- minimal head/hydraulic loss;
- designed hydraulics enables high treatable flow rates;
- shallow depth below invert reduces water table problems;
- visually unobtrusive;
- independently tested and verified by the University of Adelaide; and
- easily cleaned using eductor truck or removable lift out baskets.

2.0 Ecosol™ GPT Credentials & Case Studies

The Ecosol™ GPT is designed specifically to provide essential primary treatment of stormwater runoff. It is a compact, efficient and cost-effective solution to the ever-increasing problem of gross pollutants present in stormwater flows. Key to its success is the robust, engineered design and tangential screens housed in a pre-cast concrete pit that provides a significantly greater screening area than that of traditional direct screening trash rack designs. Further its large detention chamber enables gravitational separation to occur at low flow velocities retaining fine particulate matter conveyed in stormwater.

Urban Water Resources Centre – University of South Australia
Product Performance Testing.

In 1997 and 1998 the University of South Australia (UniSA), was commissioned to undertake a series of tests on the widely-used Ecosol™ GPT (formerly known as the RSF 4000) to confirm the product's performance. The tests measured the capture efficiency of the system under varying flow conditions and gradients and also the hydraulic healoss of the system under varying flows and gradients.

EngTest Department of Civil and Environmental Engineering –
University of Adelaide – Product Performance Testing

In October 1998 after further product development Ecosol commissioned Engtest the Department of Civil and Environmental Engineering at the University of Adelaide to undertake further testing on the system to confirm hydraulic headloss and capture efficiencies.

2.0 Ecosol™ GPT Credentials & Case Studies continued

Avocet Consulting - CFD Modelling to determine Pollutant Trapping Performance and fluid hydraulic characteristics under varying flow conditions.

In early 2000 to mid-2001 as part of the companys continuous product improvement program Ecosol engaged the services of Avocet Consulting to assess the Ecosol™ GPT's hydraulic performance, structural integrity, capture efficiency, treatable flow rates relevant to product sizing and scaling. Additional laboratory testing was also completed to monitor its performance as it filled and also to review the non-blocking, tangential filtration longevity of the system under varying flow conditions and percentage of fill.

EngTest Department of Civil and Environmental Engineering –
University of Adelaide – Performance Review

In June 2013 the University of Adelaide (EngTest) completed a series of additional product tests to further verify product performance and concurrently reviewed all past laboratory and field testing on the performance of the product to comprehensively determine its performance for current industry applications.

3.0 Warranty and Life Expectancy

The Ecosol™ GPT has a one-year warranty covering all components and workmanship. Ecosol will rectify any defects that fall within the warranty period. The warranty does not cover damage caused by vandalism and may be invalidated by inappropriate cleaning procedures or where the unit is not cleaned within the recommended frequency. The Ecosol™ GPT is designed to meet strict engineering guidelines and manufacturers guarantees and is one of the most durable stormwater treatment systems available. The stainless steel components have a life expectancy of 15 years while the precast concrete pit has a life expectancy of 50 years providing appropriate maintenance practices are employed.

4.0 Safety Considerations

The simple, yet effective design of the Ecosol™ GPT reduces OH&S risks as most of the work is undertaken in a controlled factory environment. The unit arrives to site complete and ready for installation reducing significantly on-site time, an important factor given the costs associated with delays that can be caused by inclement weather.

5.0 Environmental Impact

Ecosol is accredited to ISO 14001:2004 (Environment) and undertakes all manufacturing and construction within the requirements of this Standard. Hence, its carbon impact is limited and as the Ecosol™ GPT is housed in a precast pit and is located underground, it is aesthetically unobtrusive. Further the installation of the system provides a positive outcome for the environment significantly reducing the volume of pollutants conveyed in stormwater runoff from reaching receiving waterways.

6.0 Key Features and Benefits

The High Flow Ecosol™ GPT captures and retains more than 99% of pollutants larger than 2mm and the Low Flow Ecosol™ GPT whilst also designed as a primary treatment solution can capture and retain a significant percentage of attached Total Suspended Solids, Total Phosphorous and Total Nitrogen at its design Treatable Flow Rate (TFR). It efficiency is largely dependant on the chemical composition of the particles and the bonding of these chemical constituents to the surface of particles and the body of pollutants forming a media within the device.

Easily installed, the pre-cast, modular Ecosol™ GPT can be fitted to conduits of almost any size and shape, either within the drainage network or off-line adjacent to creeks or open channels. Its range of applications include industrial and commercial sites, such as car parks, shopping centres and wash-bays, residential developments, airports, freeways, civil construction projects and wetlands.

Key Features	Benefits
Hydraulics	• Low headloss (k) factor • Designed and managed hydraulics eliminates blockage risk • Patented hydraulically-driven barrier reduces premature by-pass • Non-blocking tangential filtration screening
Pollutant Capture and Retention	• Captures and retains more than 99% of solid pollutants > 2mm • Captures and retains up to 80% of TSS and up to 99% free oils and grease in spill situations • No remobilisation of captured pollutants
Design and Construction	• Can be sized to suit a wide range of flows, gradients and pipe sizes • Up to a GPT 4900 unit comes complete to site making installation easy and safe • Shallow depth below invert reduces water table problems • Product is made in-house thereby reducing lead times significantly
Cleaning and Maintenance	• Cost-effective vacuum cleaning so no need for the pollutants to be handled • Large pollutant storage capacity • Baffle design for emergency spill storage
Environmental Impact	• Effective pre-screening as part of a treatment train to achieve water quality objectives • Positive effect on natural ecosystem by improving water quality • Unit is housed in its own pit with little effect on the site aesthetics
Tried and Tested	• Independently laboratory field tested • Meets industry standards and guidelines

Table 1 - Ecosol™ GPT key features and benefits.

7.0 Key Dimensions

The table below shows the approximate dimensions and holding capacities for both, the low and high flow Ecosol™ GPT systems. Their capacity to retain large quantities of captured pollutants ensures that its specified capture efficiency is maintained between scheduled cleaning events.

Ecosol Product Code	Inlet/Outlet Pipe Diameter	Approx. External Dimensions (L x W x D from invert)	Holding Capacities		
			Solid Pollutants	Free Oil and Grease	Water
		(mm)	(m^3)	(litres)	(litres)
GPT 4200	Up to 375mm	2200 x 900 x 750	0.23	268	667
GPT 4300	150 to 600mm	2700 x 1350 x 750	0.32	469	1,181
GPT 4450	225 to 900mm	3600 x 1650 x 1050	1.03	1,347	3,348
GPT 4600	300 to 1200mm	4500 x 1950 x 1350	2.43	2,994	7,211
GPT 4750	450 to 1350mm	5600 x 2300 x 1650	4.83	5,711	13,608
GPT 4900	600 to 1650mm	6500 x 2600 x 1975	8.30	9,576	22,768
GPT 41050	750 to 1800mm	7450 x 2950 x 2300	13.11	14,850	35,262
GPT 41200	900 to 2100mm	8630 x 3300 x 2625	19.52	22,793	51,698
GPT 41350	1050 to 2400mm	9700 x 3700 x 2950	27.70	30,578	72,495
GPT 41500	1200 to 2400mm	10680 x 4000 x 3250	37.94	41,491	98,317
GPT 41800	1350 to 2400mm	12730 x 4700 x 3900	65.33	70,452	166,836

Table 2 - key product dimensions

Notes:

1. The unit can be sized to suit almost any type of pipe or box culvert.
2. Unit dimensions can vary depending on the vehicle load requirements and the wall thickness.

The Ecosol™ GPT is available in three configurations:

- In-line/End of Line, Low Flow Ecosol™ GPT
- In-Line/End of Line, High Flow Ecosol™ GPT and
- Off-Line Ecosol™ GPT.

Unit Design Basis

Standard product design is based on Exposure Classifications A2 for external surfaces in contact with the ground and for installations in non-aggressive soils. Where the conditions are outside the design limits of the standard Ecosol™ GPT, Ecosol must be notified in writing so that the product is designed specific to these site conditions. This includes instances where the unit is to be installed in aggressive soils, or below any permanent, or transient water table, or if the maximum depth of fill above the cover slab exceeds 3.0m for Ecosol™ GPT 4300 - 4600 and 2.0m for the Ecosol™ GPT 4750. Confirmation of the site ground and water conditions including cover is the responsibility of the client.

Unit Design Loading

The range of Ecosol™ GPT's are designed for Class B, D and up to Class G loadings suitable for underground installations in highways, airport and wharf applications.

Ecosol™
WASTEWATER FILTRATION SYSTEMS

8.0 Capture Efficiencies

In order to determine a meaningful characterisation of the products collection efficiency, an extensive verification phase was undertaken by Avocet Consulting Pty Ltd, Ecosol Pty Ltd and EngTest (The University of Adelaide). To best summarise the capture efficiency results of extensive product testing a regression of the data points using a sigmoidal regression curve was selected as it provided a conservative fit to the wide scatter of data collected. Refer to figure 1 for results of the Low Flow Ecosol™ GPT and figure 2 for results of the High Flow Ecosol™ GPT and Table 3 summarises these results.

Pollutant Capture Efficiency PSD		
Sieve Size (micron)	Capture Efficiency (%)	
	Low Flow Ecosol GPT	High Flow Ecosol GPT
600 - 2000	100%	99%
200 - 600	98%	88%
60 - 200	83%	44%
20 - 60	39%	6%

Table 3 – Typical PSD results

8.1 Low Flow Ecosol™ GPT Capture Efficiency Data

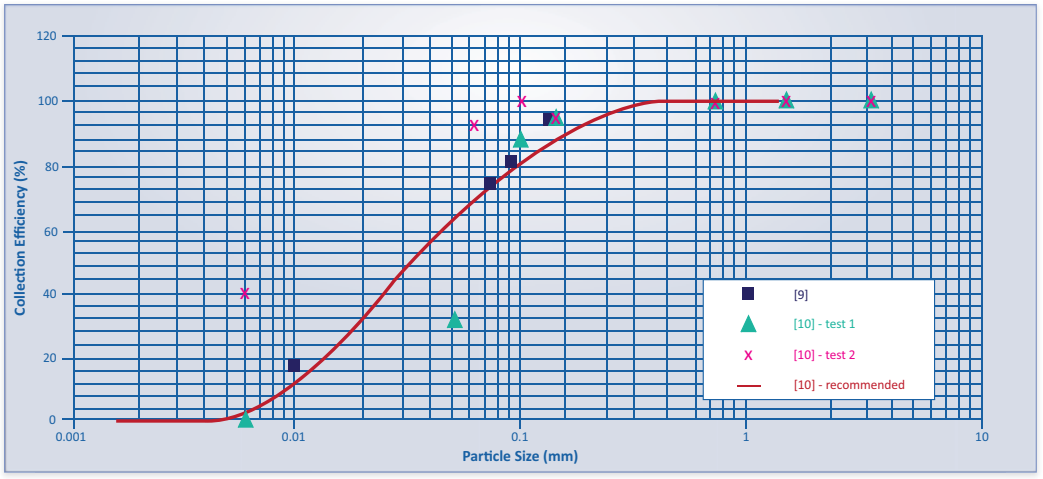


Figure 1 - Sigmoidal regression curve graph for the Low Flow Ecosol™ GPT.

8.1 Low Flow Ecosol™ GPT Capture Efficiency Data continued

Performance Criteria - Low Flow Ecosol GPT	
Pollutants	**Capture Efficiency**
Gross Pollutants (>2000µm)	99%
Total Suspended Solids (TSS) (20 - 2000µm)	80%
Total Phosphorous (TP)	45%
Total Nitrogen (TN)	45%
Total Petroleum/Hydrocarbon	99%

Table 4 – Mean average pollutant percentage reductions

Figures quoted are mean collection efficiency statistics based on available product testing data. It is important to note that the water quality CE values are indicative of potential field CEs given that the product is designed as a primary treatment solution providing physical screening and the removal of chemical constituents is largely dependent on the chemical composition of the particles and the bonding of these chemical constituents to the surface of particles. Further, finer and attached particle filtration performance of the product is also dependent on the body of pollutants forming a media already captured by the filter. Quoted CE values are intended as a general guide, please consult with your Ecosol representative for site specific product sizing and modelling.

8.2 High Flow Ecosol™ GPT Capture Efficiency Data

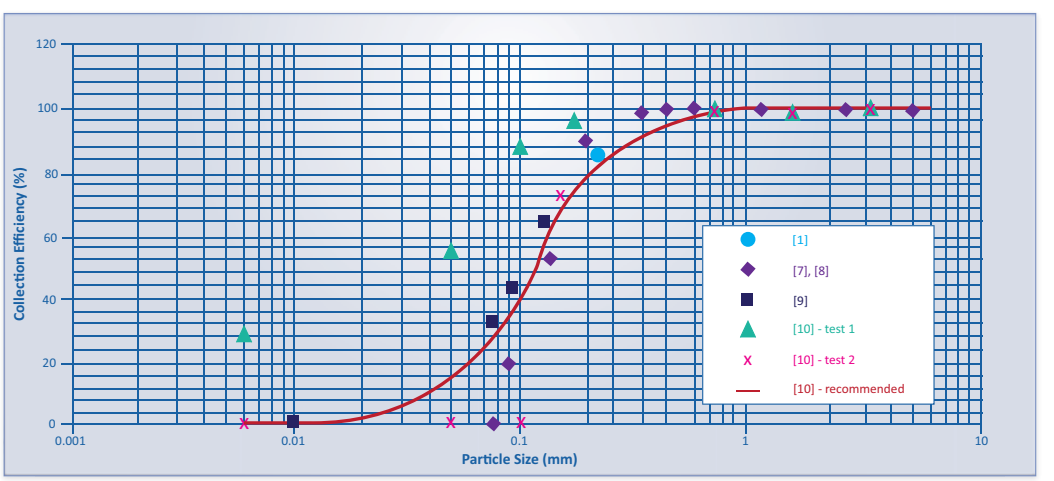


Figure 2 - Sigmoidal regression curve graph for the High Flow Ecosol™ GPT.

8.2 High Flow Ecosol™ GPT Capture Efficiency Data continued

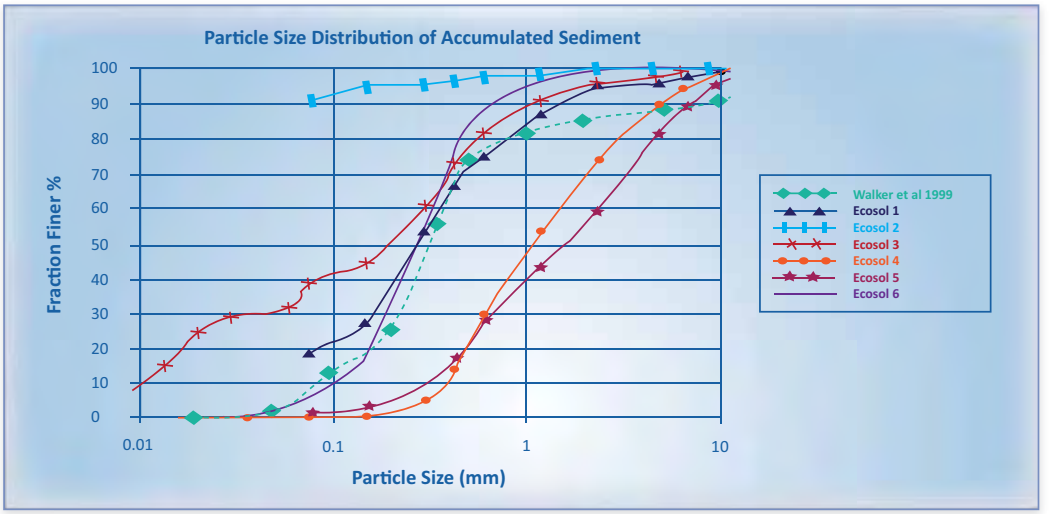


Figure 3 – Field Testing Particle size distribution data for six separate High Flow Ecosol™ GPT installations

Performance Criteria - High Flow Ecosol GPT (In-Line)	
Pollutants	**Capture Efficiency (Up to)**
Gross Pollutants (>2000µm)	99%
Total Suspended Solids (TSS) (20 - 2000µm)	55%
Total Phosphorous (TP)	40%
Total Nitrogen (TN)	40%
Total Petroleum/Hydrocarbon	99%

Table 5 – High Flow Ecosol™ GPT performance summary

Figures quoted are mean collection efficiency statistics based on available product testing data. It is important to note that the water quality CE values are indicative of potential field CEs given that product is designed primarily as a primary treatment solution providing physical screening and the removal of chemical constituents is largely dependent on the chemical composition of the particles and the bonding of these chemical constituents to the surface of particles. Further, finer and attached particle filtration performance of the product is also dependent on the body of pollutants forming a media already captured by the filter. Quoted CE values are intended as a general guide, please consult with your Ecosol representative for site specific product sizing and modelling.

9.0 MUSIC Modelling Guidelines

These guidelines provide instruction to the creation and application of a treatment node for the Ecosol™ GPT for the Model for Urban Stormwater Improvement Conceptualisation (MUSIC). The Ecosol™ GPT can be modelled in MUSIC using the Gross Pollutant Trap Treatment node to represent the results derived from independent laboratory and field testing by the University of South Australia and the University of Adelaide (Engtest The school of Civil, Environmental and Mining Engineering). The guidelines apply to the creation of the treatment node within MUSIC V6.1.0.

9.1 Product Performance

Ecosol has always sought pro-actively to validate its products through independent laboratory and extensive field testing. The test results have been verified, where appropriate by computer simulation and industry peers.

In 2012 the University of Adelaide (Engtest, The School of Civil, Environmental and Mining Engineering) completed extensive testing and measurements of the products capture efficiency, hydraulic performance and durability at varying flow rates and compiled a comprehensive product performance report (Performance Review of the Ecosol GPT) reviewing both past and present field and laboratory testing data. A copy of this detailed report is available on request.

9.2 Creating the Node

Insert a GPT treatment node into your model by selecting “GPT” under the treatment nodes menu. When the node is created the node properties dialog is displayed. There are several changes that need to be made in this dialog.

- Adjust the text in the location box to read "Ecosol GPT" plus any other relevant information (4200, 4300 etc.).
- Adjust the low flow bypass to reflect any flow (m^3/ sec) diverted away from the unit before treatment (usually zero)
- Adjust the high flow bypass to reflect the treatable flow rate (TFR values are detailed in table 8) (m^3/sec) any higher flows will bypass treatment.

NOTES: Can be used to describe assumptions or location of reduction values for authority approvals.

Adjust the transfer function for each pollutant selecting the pollutant and editing (right click on the function point) the input and output values on the graph below to reflect capture efficiencies (CE) of the treatment device. Table 6 provides the input and output values for the Ecosol™ GPT based on High Flows. Table 7 provides input and output nodes for the Ecosol™ GPT based on Low Flows.

Pollutant	Removal Rate (%)	Entered Input Value	Entered Output Value
Total Suspended Solids (20 - 2000µm)	55	1000	450
Total Phosphorus	40	1000	600
Total Nitrogen	40	1000	600
Gross Pollutants (>2000µm)	99	1000	10
Heavy Metals	25	n/a	n/a
Total Petroleum/Hydrocarbons (Dry weather spill situation)	99	n/a	n/a

Table 6 - Ecosol™ Gross Pollutant Trap – High Flow, input and output values

Pollutant	Removal Rate (%)	Entered Input Value	Entered Output Value
Total Suspended Solids (20 - 2000µm)	80	1000	450
Total Phosphorus	45	1000	600
Total Nitrogen	45	1000	600
Gross Pollutants (>2000µm)	99	1000	10
Heavy Metals	25	n/a	n/a
Total Petroleum/Hydrocarbon (Dry weather spill situation)	99	n/a	n/a

Table 7 - Ecosol™ Gross Pollutant Trap – Low Flow, input and output values

It is important to select the appropriate Treatable Flow Rate relevant to the target water quality objective for the project. Traditionally the higher the TFR of the treatment device the lower the capture efficiency, therefore it is recommended you select the optimal output values and then determine the correlating treatable flow rate of the proposed Ecosol™ GPT.

An Ecosol representative can assist you in selecting the most appropriately sized unit for your next project.

Ecosol GPT Model	Dimensions Length x Width (mm)	Low Flow Treatable Flow Rate (L/s)	High Flow Treatable Flow Rate (L/s)
Ecosol GPT 4200	2,200 x 900	15	51
Ecosol GPT 4300	2,700 x 1,350	36	120
Ecosol GPT 4450	3,600 x 1,650	78	260
Ecosol GPT 4600	4,500 x 1,950	141	470
Ecosol GPT 4750	5,600 x 2,300	219	730
Ecosol GPT 4900	6,500 x 2,600	315	1,050
Ecosol GPT 41050	7,450 x 2,950	429	1,430
Ecosol GPT 41200	8,630 x 3,300	561	1,870
Ecosol GPT 41350	9,700 x 3,700	674	2,370
Ecosol GPT 41500	10,680 x 4,000	803	2,930
Ecosol GPT 41800	12,730 x 4,700	1,076	4,210

Table 8 - Ecosol™ GPT Dimensions and Treatable Flow Rates

10.0 Design Guidelines

To ensure your system is appropriately designed for its intended application and meets local water quality objectives it is essential that the following minimum information is provided.

- Confirm the required treatable flow rate – this is the minimum stormwater run-off volume that must be treated. Typically this is the 1 in 3 month to 1 in 1 year ARI.
- Confirm the maximum design flow capacity of the drainage line. This is important as it allows us to appropriately design and model the system to cater for these peak flows at minimal headloss.
- Confirm the proposed number and locations of Ecosol™ GPT's to be installed. Where possible please provide clearly marked drainage plans indicating the proposed locations.
- Confirm local water quality objectives - Recent state governmental planning policies have established clear stormwater quality bench mark objectives for local and regional councils. Accordingly local and regional council water sensitive urban design objectives have been amended to meet these stormwater pollution reduction targets. It is important we are provided this information specific to your site and local council regulations so that we can clearly advise you of the products removal efficiency relevant to these WQO's.

For further assistance in sizing or specifying a system for your next project please complete the form in Appendix 1 and forward to your local Ecosol representative.

Ecosol's engineering team is able to provide a comprehensive design proposal for almost any project where the Ecosol™ GPT is proposed either individually or in conjunction with any other filtration systems working together in a treatment-train approach. Services offered include preliminary hydraulic, structural, and total concept designs, as well as consideration to access and hardstand designs for cleaning and maintenance. This includes MUSIC (Model for Urban Stormwater Improvement Conceptualisation) modelling, CAD drawings and product specifications together with maintenance schedules and associated costs.

Further, Ecosol can also undertake all civil and structural installation works, and our complete turnkey service also includes full maintenance of the proposed stormwater treatment systems and reporting.

11.0 Hydraulic Specification

Gross Pollutant Traps (GPT's), such as the Ecosol™ GPT, are primarily designed to remove gross pollutants (>2mm) from stormwater at high treatable flow rates (TFR) and can play an integral role in reducing pollution in heavily-urbanised catchments that discharge into our waterways.

11.1 Low Flow Ecosol™ GPT Treatable Flow Rates

The Treatable Flow Rate (TFR) is the minimum flow that a GPT must treat, without by-pass, to achieve the desired pollutant capture criteria for a particular development. It varies dependent on that catchment size and percentage of impervious area thereby determining the pipe size and gradient. Typically, the Low Flow Ecosol™ GPT is designed to treat the 1-in-3 month Annual Rainfall Intensity (ARI) discharges, with greater flows by-passing the unit.

The Low Flow Ecosol™ GPT was designed specifically to achieve high pollutant removal rates at low inflow velocities thereby providing improved gravitational separation of particulates conveyed in stormwater. Table 9 summarises the Low Flow Ecosol™ GPTs typical treatable flow rates based on product pipe size and gradient.

11.1 Low Flow Ecosol™ GPT Treatable Flow Rates continued

LOW FLOW ECOSOL™ GPT - TREATABLE FLOW RATES (L/s)															
Ecosol GPT product code	Gradient	Outlet pipe Diameters (mm)													
		100	150	225	300	375	450	525	600	750	900	1050	1200	1350	1500
GPT 4200	0.5%	1	4	6	8	9									
	1.0%	2	4	7	8	10									
	2.0%	3	5	7	9	11									
	5.0%	3	6	10	13	15									
GPT 4300	0.5%	4	6	15	23	30	35	36	36						
	1.0%	5	7	17	24	31	36	36	36						
	2.0%	7	9	18	26	33	36	36	36						
	5.0%	8	10	20	30	36	36	36	36						
GPT 4450	0.5%	9	14	15	28	36	43	49	55	64	72				
	1.0%	10	15	18	29	38	45	51	57	67	76				
	2.0%	12	18	21	31	41	49	56	63	74	78				
	5.0%	12	21	24	37	50	62	72	78	78	78				
GPT 4600	0.5%	12	15	28	36	53	67	78	88	106	121	135			
	1.0%	12	19	32	40	56	69	81	92	111	128	141			
	2.0%	12	26	38	43	59	75	89	101	122	141	141			
	5.0%	12	31	41	48	69	90	109	126	141	141	141			
GPT 4750	0.5%	9	19	34	38	55	67	79	89	107	123	137	149	161	
	1.0%	10	22	33	41	58	71	83	95	114	131	146	159	172	
	2.0%	12	28	41	48	74	77	92	105	128	375	165	180	195	
	5.0%	14	33	44	57	84	96	117	137	171	201	219	219	219	
GPT 4900	0.5%	11	23	43	59	86	97	108	118	146	169	190	209	226	242
	1.0%	12	24	44	62	91	103	111	125	154	180	202	222	240	258
	2.0%	14	30	45	68	97	111	118	138	172	202	247	251	272	292
	5.0%	16	35	47	77	108	118	124	174	226	270	309	315	315	315
GPT 41050	0.5%	11	25	53	88	127	130	133	155	187	220	249	275	299	321
	1.0%	13	27	55	91	129	133	138	158	197	233	264	293	318	343
	2.0%	16	31	57	93	130	141	142	164	217	260	297	329	359	387
	5.0%	18	37	61	96	130	146	149	171	279	342	397	429	429	429
GPT 41200	0.5%	12	27	57	97	132	168	178	181	239	272	312	347	379	410
	1.0%	14	31	59	101	134	171	181	184	241	288	331	369	404	437
	2.0%	16	35	62	104	137	175	184	193	248	320	369	415	454	492
	5.0%	18	42	65	107	142	178	186	198	251	412	487	555	561	561
GPT 41350	0.5%					134	168	178	181	239	272	378	428	467	504
	1.0%					146	174	181	184	241	288	401	450	496	537
	3.0%					154	175	184	193	248	320	445	504	556	605
	5.0%					164	182	186	198	251	412	489	557	618	674
GPT 41500	0.5%								181	239	400	471	505	558	607
	1.0%								184	241	408	476	535	592	646
	3.0%								193	248	411	481	594	662	725
	5.0%								198	251	419	488	654	732	803
GPT 41800	0.5%								181	239	503	610	707	752	828
	1.0%								184	241	508	624	713	740	876
	3.0%								193	248	513	619	718	881	975
	5.0%								198	251	521	625	724	967	1076

Table 9 - Low Flow Ecosol ™ GPT Treatable Flow Rates,

11.2 High Flow Ecosol™ GPT Treatable Flow Rates

The Treatable Flow Rate (TFR) is the minimum flow that a GPT must treat, without by-pass, to achieve the desired pollutant capture criteria for a particular development. It varies dependent on that catchment size and percentage of impervious area thereby determining the pipe size and gradient. Typically, the High Flow Ecosol™ GPT is designed to treat the 1-in-3 month to and 1-in1 year Annual Rainfall Intensity (ARI) discharges, with greater flows by-passing the unit.

The High Flow Ecosol™ GPT was designed specifically to provide essential primary treatment of stormwater flows targeting gross pollutants. Table 10 summarises the High Flow Ecosol™ GPTs typical treatable flow rates based on product selection, pipe size and gradient.

11.2 High Flow Ecosol™ GPT Treatable Flow Rates continued

HIGH FLOW ECOSOL™ GPT - TREATABLE FLOW RATES (L/s)																	
Ecosol GPT product code	Gradient	Outlet pipe Diameters (mm)															
		100	150	225	300	375	450	525	600	750	900	1050	1200	1350	1500	1650	1800
GPT 4200	0.5%	4	14	21	26	31											
	1.0%	6	15	22	28	33											
	2.0%	9	16	25	32	37											
	5.0%	10	20	33	43	51											
GPT 4300	0.5%	20	21	50	79	99	116	120	120								
	1.0%	21	23	57	82	103	120	120	120								
	2.0%	23	29	60	87	110	120	120	120								
	5.0%	27	34	67	101	120	120	120	120								
GPT 4450	0.5%			52	93	121	143	163	182	212	240						
	1.0%			60	98	126	150	171	190	223	252						
	2.0%			69	105	137	164	188	209	246	260						
	5.0%			79	124	167	205	239	260	260	260						
GPT 4600	0.5%				120	175	222	260	294	354	403	450					
	1.0%				134	185	231	272	308	371	425	470					
	2.0%				142	197	249	295	336	408	469	470					
	5.0%				161	231	299	363	421	470	470	470					
GPT 4750	0.5%						224	263	298	358	410	456	497	536			
	1.0%						236	278	315	381	437	486	531	573			
	2.0%						258	307	350	427	491	549	601	650			
	5.0%						319	391	457	571	669	730	730	730			
GPT 4900	0.5%								395	487	564	634	695	753	807	855	
	1.0%								417	515	600	674	741	803	860	913	
	2.0%								459	574	673	758	836	908	973	1036	
	5.0%								579	753	900	1030	1050	1050	1050	1050	
GPT 41050	0.5%									622	733	831	916	996	1070	1141	1204
	1.0%									657	777	881	977	1062	1143	1217	1287
	2.0%									726	867	989	1098	1198	1291	1378	1430
	5.0%									929	1139	1323	1430	1430	1430	1430	1430
GPT 41200	0.5%										907	1041	1158	1264	1367	1456	1544
	1.0%										961	1103	1230	1347	1455	1554	1647
	2.0%										1066	1231	1382	1515	1639	1756	1866
	5.0%										1375	1625	1849	1870	1870	1870	1870
GPT 41350	0.5%											1261	1416	1556	1681	1802	1916
	1.0%											1337	1501	1653	1791	1924	2045
	2.0%											1483	1681	1854	2016	2171	2310
	3.0%											1630	1858	2061	2247	2370	2370
GPT 41500	0.5%												1684	1861	2023	2175	2323
	1.0%												1782	1974	2153	2315	2467
	2.0%												1981	2206	2418	2604	2778
	3.0%												2180	2441	2677	2902	2930
GPT 41800	0.5%													2506	2759	2978	3190
	1.0%													2647	2919	3170	3394
	2.0%													2936	3251	3540	3801
	3.0%													3222	3586	3916	4210

Table 10 - High Flow Ecosol™ GPT Treatable Flow Rates

11.3 By-pass Capacity and Headloss

The range of Ecosol™ GPT's has been designed to cater for maximum flow by-pass at minimal headloss. The placement of any structure into a stormwater line will induce headloss. The extent of this headloss is a function of the velocity in the outlet pipe and the k factor adopted. The k factor must be representative of the type of structure and its operation during full-flow conditions as distinct from the TFR.

The Ecosol™ GPT has one of the lowest k factors of any GPT currently available. Extensive independent testing has been carried out to confirm the unit's k factor for a range of pipe and unit sizes based on full flow, worst case scenarios. These tests show that the k factor can vary between 0.6 and 1.5 depending on the pipe configuration and the relative unit size, as shown below.

Gradient	*k* Factor
1%	0.6
2%	1.0
3%	1.5

Table 11 – Measured maximum k factor for the Ecosol™ GPT at the suggested treatable flow rate for nonsurcharged flows.

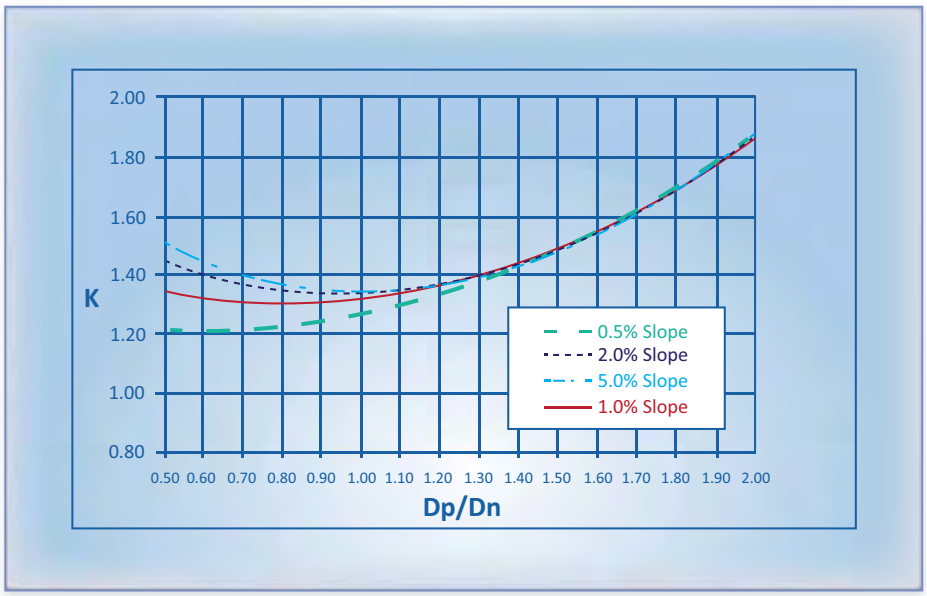


Figure 4 - Measured maximum k factors for the Ecosol™ GPT at its designed maximum by-pass flow rate (designed discharge rates) in a surcharged environment.

12.0 Cleaning and Maintenance

As with all filtration systems, the Ecosol™ GPT should be inspected and cleaned regularly. The cleaning frequency and the cost, depends heavily on the catchment size and type, the unit's proximity to a waste facility and the quality and quantity of stormwater runoff.

The cleaning frequency may vary with local catchment conditions but the below figures are based on typical gross pollutant loads expected for typical commercial, residential and light industrial catchments and provide a broad guideline about the catchment size and the number of cleans required annually. Gross pollutants include vegetation as well as anthropogenic litter but excludes sediment. The figures give consideration to the volume of pollutants in the unit and to eductor truck holding capacities and cleaning costs for a fully-loaded truck. In some instances, it may be cheaper to clean a unit more frequently than undertaking, say, annual cleans where the volume requires more than one truck load. One of the key advantages of the Ecosol™ GPT is that it can be designed for cleaning by either vacuum (eductor truck) or removable basket (crane truck) method.

12.1 Indicative Catchment Size and Recommended Cleaning Frequencies for the Low Flow Ecosol™ GPT

Product Code	Catchment Size (Ha)	Recommended number of cleans based on catchment Sizes and typical pollutant loads (annually)[1]		
		Residential	Commercial	Light Industrial
Low Flow Ecosol GPT 4200	Up to 1	1	1	1
Low Flow Ecosol GPT 4300	Up to 2	1	1	1
Low Flow Ecosol GPT 4450	Up to 3	1	1	1
Low Flow Ecosol GPT 4600	Up to 6	1	1	1
Low Flow Ecosol GPT 4750	Up to 11	1	1	1
Low Flow Ecosol GPT 4900	Up to 14	1	1	1
Low Flow Ecosol GPT 41050	Up to 21	1	1	1
Low Flow Ecosol GPT 41200	Up to 27	1 - 2	1 - 2	1 - 2
Low Flow Ecosol GPT 41350	Up to 33	1 - 2	1 - 2	1 - 2
Low Flow Ecosol GPT 41500	Up to 45	1 - 2	1 - 2	1 - 2
Low Flow Ecosol GPT 41800	Up to 54	2	2	2

Table 12 - Low Flow Ecosol™ GPT Cleaning Frequencies

12.2 Indicative Catchment Size and Recommended Cleaning Frequencies for the High Flow Ecosol™ GPT

Product Code	Catchment Size (Ha)	Recommended number of cleans based on catchment Sizes and typical pollutant loads (annually)[1]		
		Residential	Commercial	Light Industrial
High Flow Ecosol GPT 4200	Up to 1.0	2	2	2
High Flow Ecosol GPT 4300	Up to 2.0	2	2	2
High Flow Ecosol GPT 4450	Up to 5.0	2	2	2
High Flow Ecosol GPT 4600	Up to 20.0	2	2	2
High Flow Ecosol GPT 4750	Up to 35.0	2	2	2
High Flow Ecosol GPT 4900	Up to 45.0	2	2	2
High Flow Ecosol GPT 41050	Up to 70.0	2	2	2
High Flow Ecosol GPT 41200	Up to 90.0	2	2 - 3	2 - 3
High Flow Ecosol GPT 41350	Up to 110.0	2 - 3	2 - 3	2 - 3
High Flow Ecosol GPT 41500	Up to 150.0	3	2 - 3	2 - 3
High Flow Ecosol GPT 41800	Up to 180.0	3	3	3

Table 13 - High Flow Ecosol™ Cleaning Frequencies

13.0 Monitoring

Under normal weather and operating conditions, your Ecosol™ GPT should be checked, minimum every six months depending on quality and quantity of the inflow to the unit. Initially, Ecosol recommends that monitoring is undertaken monthly or immediately after a major rain event. Once the unit has been in operation for an extended period of time (say, 12 months) then the monitoring schedule can be adjusted to reflect the actual operating conditions specific to the catchment.

Under normal operating conditions the unit would normally require cleaning approximately every 6 - 12months.

14.0 Ecosol Monitoring, Cleaning, and Maintenance Service

An essential element of any good stormwater management program includes regular inspections, cleaning, and maintenance of installed Stormwater Quality Improvement Devices (SQIDS) to ensure that they continue to capture and retain pollutants to their designed specifications without premature by-pass and without any adverse impact on the drainage capacity of the stormwater conduit that it is installed on.

Cleaning frequencies, methodologies and even they equipment used to maintain these systems will vary depending on the type of device installed the catchment type, size and rainfall patterns.

At Ecosol we offer:

- a competitive cleaning and maintenance service;
- a long-standing record in safe work practices, supported by Quality Assured processes;
- in-depth knowledge and experience with all popular types and brands of GPTs;
- a complete understanding of pollution removal and disposal regulations and processes that ensures your unit is cleaned effectively and efficiently without risk of damage; and
- useful, easy-to-read reports, allowing you to track performance and pollution loading.

15.0 Applications and Configurations

The Ecosol™ GPT is usually installed In-Line/end-of-line on stormwater pipes or box culverts ranging in size from 200mm to 1800mm, although is suitable for larger pipes and box culverts. The product can be easily intergrated into most drainage designs for residential, commercial or industrial applications .

Commercial Precincts

Carparks

Residential Development

The unit is also suitable for installation off-line adjacent to large open channels or drains.

The Ecoso™ GPT is able to be custom designed specific to you application. We can vary the loading class, pit depth and accommodate varying pipe types and sizes.

16.0 Turnkey Services

Ecosol's design and estimating staff provide a dedicated management approach towards your project. In addition all staff are capable of liaising with the client, the consulting engineer, the contractor, and all other interested third parties to achieve a successful outcome.

17.0 Accreditation

Ecosol is accredited to AS/NZS ISO 14001-2004 (Environment) and AS/NZS 9001:2008 (Quality). Our commitment to continuously improving our products and services is demonstrated by our ongoing accreditation for Quality and Environmental Management. Ecosol is also committed to a safe environment for its employees. We are fully third-party accredited to AS/NZS 4801:2001.

18.0 Suppiler and Technical Product Contact Details

For any maintenance or technical product enquiries please contact:
Ecosol Pty Ltd
Tel: 1300 706 624
Fax: 1300 706 634
Email: info@ecosol.com.au

Appendix 1

Ecosol™ GPT Essential Information Form

To ensure your system is appropriately designed for its intended application and meets local water quality objectives it is essential that the following minimum information is provided:

Customer Details	
Contact Person:	
Company Name:	
Phone:	
Fax:	
Email:	

Project and Site Information	
Project Name:	
Project Address:	
Type of Development/Catchment Type:	
Pollutant Removal Targets (%): Site Water Quality Objectives (WQO's)	Gross Pollutants (>2000µm)
	Total Suspended Solids (20 – 2000µm)
	Total Phosphorus
	Total Nitrogen
	Heavy Metals
	Total Petroleum/ Hydrocarbon
	Other
Local Authority:	
Device Location:	
Designed Discharge (Peak ARI Flow Rate) L/s:	
Treatable Flow Rate (L/s):	
Tidal or submerged (inundated) system:	
Inlet Pipe Diameter/Size	
Depth to Inlet pipe invert level	
Preferred access cover type and loading (Grated or solid top) (Class A, B or D)	
Other essential design or site relevant information:	

Please forward the above information for your next project to your local Ecosol representative. On receipt Ecosol will model and design the most appropriately sized system to suit your application to assist you achieve the project Water Sensitive Urban design objectives. - Email: info@ecosol.com.au - Fax: 1300 706 634.

Appendix 2

References

(Please note that the Ecosol™ GPT was originally known as the Ecosol RSF 4000.)

Mr J Pisaniello & Assoc. Porf. J Argue (1998) Testing of the Ecosol RSF 4000 for Hydraulic Headloss – Urban Water Resources Centre University of South Australia.

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Appendix 2 continued

References

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Dr M Lambert (2001) RSF 4000 Stormwater Filter Performance Testing – EngTest, The Department of Civil and Environmental Engineering – The Adelaide University.

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Dr. A Wallace (2002) Technical Report – Sediment Collection Efficiency measurements on the Ecosol 4000 Gross Pollutant Trap - Avocet Consulting Pty Ltd

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Manly Hydraulics Laboratory (2004) (NSW Department of Commerce) – SQIRTS Assessment at Solander Park Erskineville

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Prof. M Lambert, Dr. A Zecchin (2013) Performance Review of the Ecosol GPT Stormwater Pollutant Filter – EngTest , The Department of Civil and Environmental Engineering – The Adelaide University.

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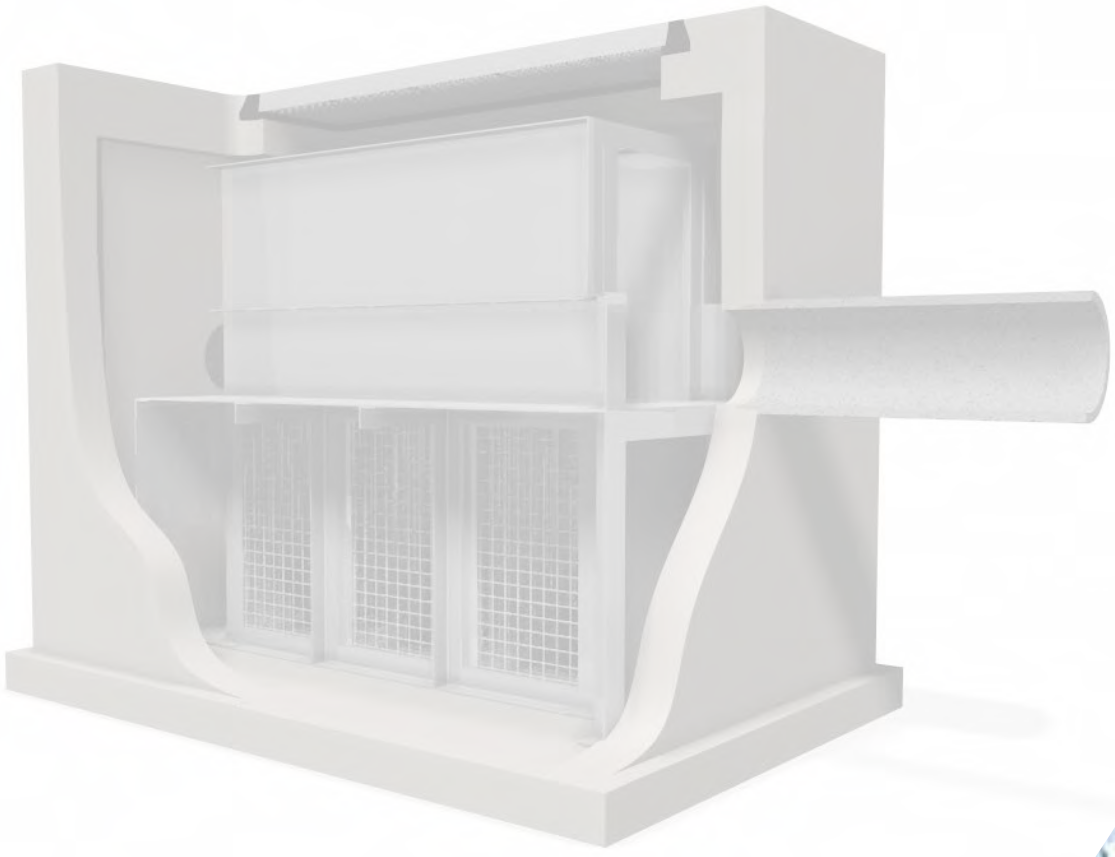

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Fusion Engineering Services - Stormwater Management Concept Plan

Stormwater Management Concept Plan of Residential Subdivision

Property:
Lot 4, DP 539244
Lot 1, 2, 10 &11, DP 719990
Lot 100, DP 706378

DATE:	14.09.2016
SITE ADDRESS:	Eagleview Road, Minto
JOB NUMBER:	2016-2115
CLIENT:	Tangible Planning Solutions
REPORT PREPARED BY:	ROSHAN
CHECKED/ APPROVED BY:	ARUN SHRESTHA

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Any questions or queries regarding this report should be directed to the Fusion Engineering on 1800 787 750 or at info@fusionengineering.com.au

Revision History

Date	Version	Author	Comments
14.09.2016	V0	Roshan	For Comment

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1 INTRODUCTION

Tangible Planning Solutions commissioned FUSION Engineering Services in September 2016 to prepare stormwater management concept plan to rezone six (6) parcels of land from 'E4 Environmental Management' to 'R2 Low Density Residential'.

The lands proposed for rezoning have an overall area of approximately 3.8Ha and include:

- Lot 100, DP 706378 – 229 Eagleview Road, Minto
- Lot 4, DP 539244 – 221 Eagleview Road, Minto
- Lot 1, DP 719990 – 223 Eagleview Road, Minto
- Lot 2, DP 719990 – 225 Eagleview Road, Minto
- Lot 10, DP 719990 – 25 Goodsell Street, Minto
- Lot 11, DP 719990 – 27 Goodsell Street, Minto

The rezoning will enable the future subdivision of land into 450m^2 allotments.

This report has been prepared to accompany a Planning Proposal to rezone six parcels of land from 'E4 Environmental Management' to 'R2 Low Density Residential' that will address Campbelltown City Council's (Councils) stormwater requirements in accordance with the following documents:

- *Development Control Plan 2014 – Volume 3 – Engineering Design for Development*, Campbelltown (Sustainable City)
- *Draft NSW MUSIC Modelling Guidelines*, WBM BMT, August 2010

2 SITE DESCRIPTION

2.1 Existing Site

The subject site as shown in Figure 1, is approximately 3.8ha and are currently developed into six (6) large lot residential housing parcels. Each parcel generally comprises a large well-established dwelling house, associated garages and storage buildings, outdoor entertainment areas and landscaped gardens. The east, south and west side of the subject land comprise low-density residential dwellings. To the north, the land is characterised by large lot residential development.

Figure 1: Location of Site (Source: Department of Lands - Six Maps)

The subject lands have gentle slope with summit and valley within the site. More than three-fourth of the subject land falls towards the valley within the subject land which falls towards Eagleview Road and then to Mcbarron Creek. The remaining land at the eastern side falls towards Goodsell Street.

Lot 10 and 11, DP 719990 (25 and 27Goodsell Street) have access from Goodsell Street. The other properties proposed for rezoning have access from Eagleview Road.

Figure 2: Site Layout (Source: Department of Lands - Six Maps)

2.2 Concept Development

The Planning Proposal is seeking to rezone six parcels of land from 'E4 Environmental Management' to 'R2 Low Density Residential'. The lands proposed for rezoning have an overall area of approximately 3.8Ha and include:

- Lot 100, DP 706378 – 229 Eagleview Road, Minto
- Lot 4, DP 539244 – 221 Eagleview Road, Minto
- Lot 1 and 2, DP 719990 – 223 and 225 Eagleview Road, Minto
- Lot 10 and 11, DP 719990 – 25 and 27 Goodsell Street, Minto

The rezoning will enable the future subdivision of land into 450m2 allotments. At this early stage, it is anticipated that the potential yield approximately forty (40) allotments. The concept development plan is presented in *Appendix A*.

3 COUNCIL REQUIREMENRS

The proposed planning proposal is subject to assessment by Campbelltown City Council and must conform to their standards.

3.1 Stormwater Management

The following are the requirements of council for the management of stormwater in new developments.

- All stormwater systems shall be sized to accommodate the 100-year ARI event.
- Council requires appropriate water cycle management for the new developments that increase the quality and reduce the quantity of stormwater leaving the site. This can be achieved by incorporating treatment train approach to water quality and on site detentions for water quantity.
- A major (flood/minor piped flow) approach to drainage is to be taken for flows within the road reserve.
- A suitable easement shall be created over all downstream properties for development that cannot directly dispose of stormwater (under gravity) to the street or directly to Council's trunk stormwater system.
- All proposed drainage structures incorporated within new development shall be designed to maintain public safety.
- The water management system shall be designed such that it can be economically maintained. A maintenance plan for this system shall be developed and implemented as part of the development.

3.2 Water Quantity

The Campbelltown City Council, Development Control Plan (DCP) sets objectives for the reduction of pollutants in runoff from new developments, these targets are shown in Table 1

Table 1: Water Quality Objectives

Pollutant	Reduction Target
Total Suspended Solids (TSS)	80%
Total Phosphorous (TP)	45%
Total Nitrogen (TN)	45%
Gross Pollutants	90%

3.3 Water Quantity

Many older areas of Campbelltown have undersized piped stormwater systems and some overland flow paths are insufficient to convey the design flows. Additionally, the current development footprint is much larger than in the past and stormwater systems cannot cope with the additional flows from impervious surfaces.

Council requires to ensure that stormwater flows from the site are not in excess of downstream system capacity of the existing stormwater system. Council prefers to upgrade the existing downstream stormwater system to take the increased flows. As this requires an onerous amount of work on one developer, Council also consider the use of on-site detention systems.

To meet the water quantity requirement On Site Detention system has been proposed in the concept plan of the subdivision. The permissible site discharge from the site has been set to pre development (current) flow rates for all storms up to the 100 year ARI storm.

4 STORMWATER MANAGEMENT STRATEGY

Refer to *Appendix B* for the stormwater management concept plan of the concept development. The features of the concept plan are as follows:

- Stormwater drainage for the development will be provided by means of a pit and pipe system within the road reserve which caters for the minor event (5 year ARI), and overland flow paths which are designed for the 100 year ARI stormwater flows. Pits and pipe system is not shown on the concept design and is subject to detailed design.
- Residential roof areas will drain to rainwater tanks as per BASIX requirements. Rainwater tanks will overflow to the pit and pipe stormwater system.
- The pit and pipe stormwater system of the development area that falls towards Eagleview Road will flow to an end of line GPT before discharging to a combined on site detention (OSD) and bioretention basin.
- The pit and pipe stormwater system of the development area that falls towards Goodsell Street will flow to an end of line GPT before discharging to an on site detention (OSD) tank.
- All runoff from the development will flow through the on site detention (OSD) systems.
- OSD will be provided to match pre and post development flows.
- The bioretention treatment area within the basin will be sized based on achieving the pollutant reduction targets as defined by Council's *DCP 2009 Volume 2 – Engineering Design for Development.*

5 WATER QUANTITY

Campbelltown (Sustainable City) Development Control Plan 2014 – Volume 3 – Engineering Design for Development states:

The maximum discharge from the post-development site is not to exceed the pre-developed flows for all storms up to the 100-year ARI storm and concentrated flows must be managed.

OSD volumes were determined based on matching pre-development and post-development flows for a range of rainfall events (5 year ARI, 20 year ARI and 100 year ARI). DRAINS modelling software was used for the hydrological and hydraulic modelling. Hydraulic modelling was undertaken for the purposes of determining the basin OSD volume and footprint area.

DRAINS modelling was undertaken for the entire development site. Individual pits and pipes were not modelled at this stage, and will be subject to detailed design.

Refer to *Appendix D* for the DRAINS modelling layout and results.

5.1 IFD Chart

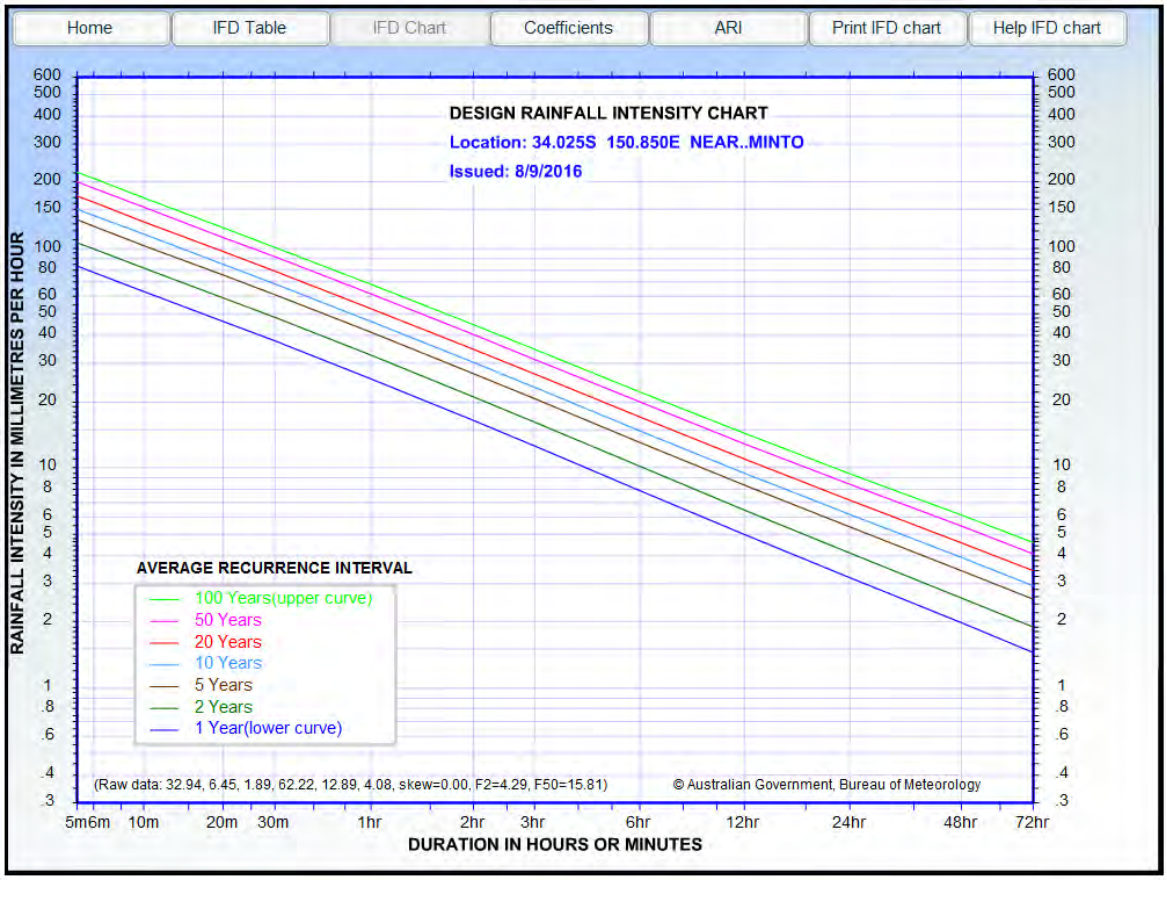

Figure 3: IFD Chart for the site (courtesy of Bureau of Meteorology)

5.2 DRAINS Modelling Parameters

The ILSAX model has been used in DRAINS software to calculate design flows. The data used in the model are presented in Table 7 below.

Table 2: DRAINS Modelling Parameters

Parameter	Value
DRAINS model used	ILSAX
Design Storm Event - Minor - Intermediate - Major	 - 5 year ARI - 20 year ARI - 100 year ARI
Paved (Impervious) area depression storage	1mm
Grass (Pervious) area depression storage	5mm
Soil type	2 (moderate infiltration rate)

The ARR87 method in ILSAX model is used to derive design rainfall. The rainfall data of 1hr, 12hr and 72 hr duration for the 2 year and 50 year ARI storm event have been taken from Figure 5: Intensity Duration Frequency Chart of Minto obtained from Bureau of Meteorology. The factor G, F2 and F50 were taken from Australian Rainfall and Runoff Volume 2. The rainfall data and factors used in ILSAX model are presented in Table 3 below.

Table 3: Rainfall Data for ILSAX Model

Rainfall Duration	Rainfall Intensities		Hydrological Factors	
	2 Year ARI	50 Year ARI		
1 Hour	32.94	62.22	G	0.0
12 Hour	6.45	12.89	F2	4.29
72 Hour	1.89	4.08	F50	15.81

5.3 Catchment Area

The area of the concept development site is divided into 7 sub-catchments for modelling purpose. As the summit of the area is within the development site, there will be no flow from external catchments to the development site.

Table 4 presents sub-catchment parameters for DRAINS modelling.

Refer to *Appendix C* for the Catchment Plan for the development.

Table 4: Sub-catchment Parameters for DRAINS Modelling

Sub-catchment	Area (ha)	Time of Concentration (minutes)	Pre Development % Impervious	Post Development % Impervious
1	0.54	15	20	60
2	0.60	15	20	60
3	0.51	15	20	60
4	0.60	15	20	60
5	0.34	15	20	60
6	0.61	15	20	60
7	0.60	15	20	60

5.4 Pre Development Flows

Pre-development flows were determined using DRAINS for 5, 20 and 100 year ARI rainfall events. This provides a full range of storm events for development of suitable OSD for the development.

Table 5: Peak Pre-Development Flows

Rainfall Event	Peak Pre-Development Flow (m^3/s)	
	Eagleview Road	Goodsell Street
5 year ARI	0.292	0.058
20 year ARI	0.536	0.104
100 year ARI	0.787	0.155

5.5 Post Development Flows

Table 6 shows the overall peak post-development flows from the site with no OSD. The peak pre-development flows are replicated in this table for comparison. As shown in Table 6 the peak flows from the site have increased with development of the site.

Table 6: Peak Post Development Flows without Attenuation

Rainfall Event	Eagleview Road		Goodsell Street	
	Peak Pre Development Flow (m^3/s)	Peak Post Development Flow (m^3/s)	Peak Pre Development Flow (m^3/s)	Peak Post Development Flow (m^3/s)
5 year ARI	0.292	0.534	0.058	0.107
20 year ARI	0.536	0.766	0.104	0.152
100 year ARI	0.787	1.02	0.155	0.2

5.6 On Site Detention

Two On Site Detentions (OSD) have been proposed in this concept development plan. One will be the underground reinforced concrete tanks that will be provided under the driveway/access way from Goodsell Street to two new lots that attenuate flows to Goodsell Street. The other will be provided within the basin at the northern side of access way from Eagleview Road as shown in Appendix B. Both On Site Detentions (underground tank and basin) were sized using DRAINS software to ensure the post-development flows from each catchment matched the pre development flows. Refer to Appendix D for the DRAINS modelling results. Table 7 shows the post development flows from the basin which discharges to the existing council's stormwater drainage network at Eagleview Road and Goodsell Street. The peak pre-development flows are replicated in this table for comparison. The basin design parameters at the northern side of access way from Eagleview Road used in order to achieve the required detention are shown in Table 8. The underground On Site Detention Tank below access way from Goodsell Street is shown in Table 9.

Table 7: Summary of Pre and Post Development Flows

Rainfall Event	Eagleview Road		Goodsell Street	
	Peak Pre Development Flow (m^3/s)	Peak Post Development Flow (m^3/s)	Peak Pre Development Flow (m^3/s)	Peak Post Development Flow (m^3/s)
5 year ARI	0.292	0.257	0.058	0.055
20 year ARI	0.536	0.526	0.104	0.100
100 year ARI	0.787	0.680	0.155	0.133

Table 8: OSD Basin Design Parameters

Design Parameters	Value
Volume (m^3)	537
Floor Area (m^2)	900
Internal Batter Slope	1V:4H
Top of Batter Area (m^2)	900
Storage Depth	1.3m
Weir Height	1.3m

Note: Basin volume includes the extended detention depth for bioretention.

Table 9: OSD Tank Design Parameters

Design Parameters	Value
Volume (m^3)	71
Floor Area (m^2)	50
Storage Depth	1.42m

As shown the post-development flows are equal to or lower than pre-development for the 5, 20 and 100 year ARI events. Thus, the concept development does not increase the flow rate at Eagleview Road and Goodsell Street and hence the development does not increase the risk of flooding downstream of the development site including Goodsell Street and Eagleview Road.

Refer to Appendix D for DRAINS modelling results.

6 WATER QUALITY

To meet the water quality requirements of the Campbelltown (Sustainable City) Council's Stormwater Policy, stormwater treatment is required on development site. The proposed stormwater treatment trains of this concept plan include roof water reuse tanks, gross pollutant traps and bioretention basin. An On Site Detention Tank is also included but, it is not considered for water quality modelling. Canopy Planting Strip is also not included in water quality modelling

6.1 Treatment Devices

The stormwater design for the concept development will use a combination of at source and conveyance controls to treat the stormwater runoff from the site. The following are the treatment trains proposed for this development.

6.1.1 Rainwater Tank

It is proposed that each dwelling will have at least 2kL rainwater tanks capturing runoff from 100% of the roof area. The tank is to be used for toilets flushing, laundry and outdoor re use.

The tank is to be fitted with a council approved first flush device. Overflows from rainwater tanks will be directed to the nearest pit from where it is conveyed to Gross Pollutant Trap and then to bioretention basin / on site detention tank and ultimately to Council's stormwater system.

6.1.2 Gross Pollutant Trap

Gross Pollutant Traps (GPT) are proposed upstream of On Site Detention basin/tank. The GPT to be used upstream of bioretention basin at the northern side of access way from Eagleview Road is ECOSOL GPT 4450 or similar approved. The GPT to be used upstream of underground on site detention tank at the access way from Goodsell Street is ECOSOL GPT 4200 or similar approved. It removes Gross pollutants, Total Suspended Solids (TSS), Total Phosphorous (TP), Total Nitrogen (TN) and Total Petroleum/Hydrocarbon. The performance criteria of low flow Ecosol GPT is presented in Table 10.

Table 10: Performance Criteria - Low Flow ECOSOL GPT

Performance Criteria – Low Flow ECOSOL GPT	
Pollutant	**Capture Efficiency**
Gross Pollutant (>2000μm)	99%
Total Suspended Solids (TSS) (20 - 2000µm)	80%
Total Phosphorous (TP)	45%
Total Nitrogen (TN)	45%
Total Petroleum/Hydrocarbon	99%

Ecosol Gross Pollutant Trap technical specification is provided in Appendix E. Figure 4 shows a section and Transfer function of Ecosol GPT.

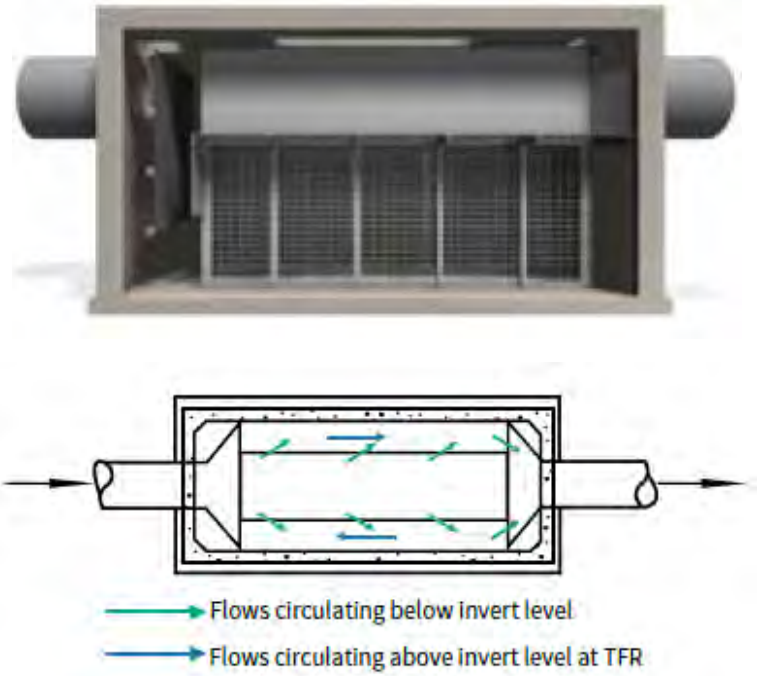

Figure 4: ECOSOL Gross Pollutant Trap

6.1.3 Bioretention Basin

A combined bioretention and on site detention basin is proposed at the northern side of access way from Eagleview Road. The surface area of the basin is 200 m^2 and the detention depth is 0.3m. The depth of filter media is 0.4m. The basin will have high flow bypass weir to help safely convey the 100 year flow and to treat low flows before they are discharged into the On Site Detention basin. Figure 5 shows a typical section of bioretention basin. Figure 6 shows a photo of bioretention basin.

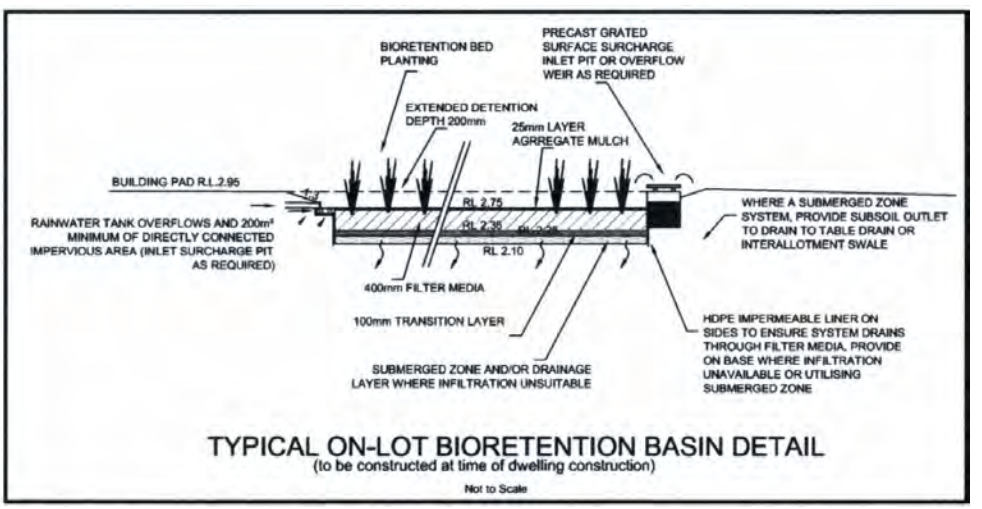

Figure 5: Typical section of Bio-retention Basin

Figure 6: Photo of Typical Bioretention Basin

6.2 Water Quality Modelling

The software used for the water quality modelling is MUSIC 6 HL. This program is well regarded as industry best practice for analysis of the effectiveness of treatment mechanisms on the quality of stormwater runoff from a development site of this size.

MUSIC simulates the performance of stormwater management systems in removing nutrients and sediments from a catchment by evaluating the average annual pollutant load delivered to the receiving waters.

It uses both source nodes (produce pollutants) and treatment nodes (remove pollutants) to analyse a stormwater system.

6.3 MUSIC Modelling Parameters

6.3.1 Rainfall Data

MUSIC requires the user to input both rainfall and evaporation data. Rainfall data is required in the form of six (6) minute rainfall data, over a minimum period of 5 years that closely matches the historical average annual rainfall for the area.

The rainfall data was sourced from the Bureau of Meteorology (BOM). The rainfall data from Station 066190 (Ingleburn, Sackville Street) was reviewed and it was found that the historical average annual rainfall for the area is 725mm and 90th percentile annual rainfall is 923mm.

The rain gauge with complete six (6) minute rainfall data was found to be station 066124 (Parramatta North, Masons Drive). This gauge was reviewed and it was found that the average annual rainfall of 15 year period between 1985 and 1999 is 926mm. To be in conservative side, the rainfall data for this period was deemed the most valid to use for the MUSIC model.

The three month ARI flow is assumed to be 50% of 1 year ARI flow. The 3 months ARI post development flow from the development site at Eagleview Road estimated to be 148 l/s and Goodsell Street is estimated to be 29l/s.

6.3.2 Evaporation Data

Evaporation data is also sourced from Bureau of Meteorology and is presented in Table 11.

Table 11: Monthly Potential Evapotranspiration

Month	Potential Evapotranspiration (mm)
January	173
February	128
March	116
April	76
May	50
June	38
July	38
August	55
September	75
October	120
November	146
December	154

Figure 7 presents the rainfall and evapotranspiration graph for the duration considered for MUSIC modelling.

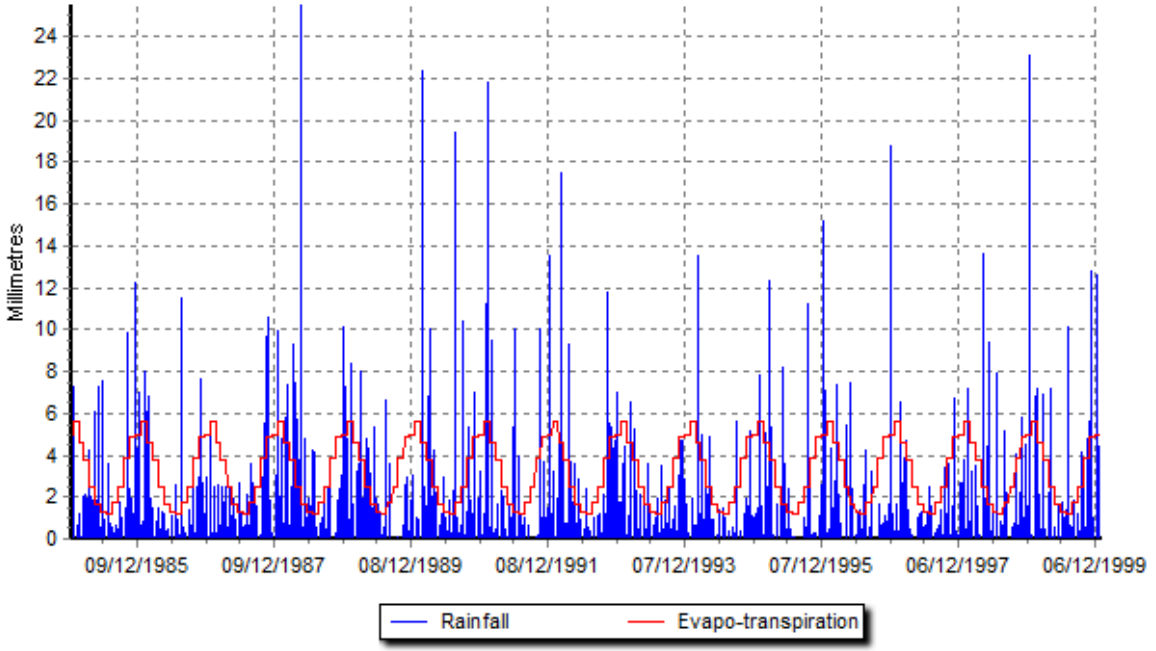

Figure 7: Rainfall and Evapotranspiration Graph

6.3.3 Sub-catchment Parameters

The area of development site is approximately 3.8 ha. The catchment was broken into three types of sub-catchments in order to adequately model the use of the treatment devices. Table 12 presents MUSIC modelling sub-catchment parameters.

Table 12: MUSIC Model Sub-catchment Parameters

Sub-catchment	Area (ha)	% Impervious
Yard / Driveway / Open Space	1.8	25 – Catchment falls to Eagleview Road 50 – Catchment falls to Goodsell Street
Roof	1.2*	100
Road Reserve	0.8	75

**Assumes 300m^2 of roof area per lot*

Detailed sub-catchment parameters for the roof, paved and other areas were developed in accordance with the *Draft NSW MUSIC Modelling Guidelines (2010)*.

Site soils have been assumed to be sandy loam. Further refinement of the MUSIC model may be required during detailed design when additional geotechnical information is available.

Table 13: MUSIC Impervious Properties

Impervious Properties	
Node Type	Rainfall Threshold (mm)
Yard / Driveway / Open Space	1.0
Roof	0.3
Road Reserve	1.5

Table 14: MUSIC Pervious Properties

Pervious Properties	
Soil Storage Capacity – 98 mm	Initial Depth – 10mm
Initial Storage – 25%	Daily Recharge Rate – 60%
Field Capacity – 70 mm	Daily Base Flow Rate – 45%
Infiltration Coefficient A - 250	Daily Seepage Rate – 0%
Infiltration Coefficient B – 1.3	

Table 15: MUSIC Pollutant Loads

Node Type	Base Flow (Log_{10}mg/L)	Std Dev (Log_{10}mg/L)	Storm Flow (Log_{10}mg/L)	Std Dev (Log_{10}mg/L)
Yard / Driveway / Open Space				
TSS	1.15	0.17	1.95	0.32
TP	-1.22	0.19	-0.66	0.25
TN	-0.05	0.12	0.30	0.19
Roofs				
TSS	-	-	1.30	0.32
TP	-	-	-0.89	0.25
TN	-	-	0.30	0.19
Road Reserve				
TSS	1.20	0.17	2.43	0.32
TP	-0.85	0.19	-0.30	0.25
TN	0.11	0.12	0.34	0.19

6.3.4 Treatment Trains Parameters

Rainwater Tank

Table 16 presents model parameters of rainwater tanks used in MUSIC model.

Table 16: Rainwater Tank Parameter

Parameters	Value	
	Catchment to Eagleview Road	Catchment to Goodsell Street
Low flow bypass (m^3/s)	0	0
High flow bypass (m^3/s)	0.148	0.029
Number of Tanks	33	7
Volume below overflow pipes (kL)	2	2
Depth above overflow (m)	0.2	0.2
Surface Area (m^2)	1.4	1.4
Initial volume (m^3)	1	1
Overflow pipe diameter mm)	100	100

Gross Pollutant Trap

Table 17 presents model parameters of GPTs used in MUSIC model.

Table 17: Gross Pollutant Trap Parameter

Parameters	Value	
	Catchment to Eagleview Road	Catchment to Goodsell Street
Low flow bypass (m^3/s)	0	0
High flow bypass (m^3/s)	0.148	0.029
Trap Efficiency		
Total Suspended Solids (TSS)	80%	80%
Total Nitrogen (TN)	45%	45%
Total Phosphorous (TP)	45%	45%
Gross Pollutants (GP)	99%	99%

Bioretention Basin

Table 18 presents model parameters of Bioretention Basin used in MUSIC model.

Table 18: Gross Pollutant Trap Parameter

Parameters	Value
Low flow bypass (m^3/s)	0
High flow bypass (m^3/s)	0.148
Extended Detention Depth (m)	0.3
Surface Area (m^2)	200
Filter	180
Unlined filter media perimeter (m)	58
Saturated hydraulic conductivity (mm/hr)	50
TN content of filter media (mg/kg)	800
Orthophosphate of filter media (mg/kg)	55
Exfiltration rate	0
Base lined	No
Vegetated with effective nutrient removal plant	Yes
Overflow weir width (m)	6
Underdrain present	Yes
Submerged zone with carbon present	No

6.4 MUSIC Model Layout

A screenshot of the MUSIC model of the development site with no treatment is shown in Figure 8 and with treatment is shown in Figure 9.

Figure 8: Schematic Layout of MUSIC Model with No Treatment

Figure 9: Schematic Layout of Music Model with Treatment

6.5 Results and Discussion

Table 19 below shows a screen capture from the MUSIC model giving the expected treatment efficiencies for the system before it releases water to Council's stormwater system and the corresponding reduction targets of the Moonee Valley Council.

Table 19: Music Model Results

Pollutant	Post Developed (No Treatment) Load (kg/yr)	Post Developed (With Treatment) Load (kg/yr)	% Reduction
TSS	2830	442	84
TP	6.42	3.25	49
TN	51.2	25	51
Gross Pollutants	592	5.33	99

It can be seen from Table 19 that the reduction targets Total Suspended Solids (TSS), Phosphorous, Nitrogen and Gross Pollutant are met by the treatment system.

MUSIC does not explicitly calculate treatment efficiency for hydrocarbons and oils. However, the proposed ECOSOL GPT 4200 and 4450 has Total Petroleum/Hydrocarbon trap efficiency of 99% which meets the desired requirement.

7 CONCLUSION

The concept development will meet the requirements of Campbelltown (Sustainable City) for water quantity and water quality provided the treatment measures as outlined in Table 20 are implemented within the construction of the subdivision.

Table 20: Summary of Stormwater Treatment Measures

Treatment Measures	Requirement
Rainwater Tank	Required on each dwelling with a minimum of 2kL volume, reuse to be included for toilets and irrigation
GPT	The development has been modelled with a ECOSOL GPT 4200 and ECOSOL GPT 4450 units. This unit is considered suitable for the catchment area. Other GPT units may be specified during detailed design subject to approval.
On Site Detention / Bioretention Basin	To be combined bioretention and OSD. Bioretention filter area to be minimum 200m^2 with extended detention depth of 0.3m. OSD volume of basin at the northern side of access way from Eagleview Road to be minimum 537m^3. And underground on site detention tank below access way from Goodsell Street to be 71m^3. The post-development flows are equal to or lower than pre-development for the 5, 20 and 100 year ARI events. Thus, the concept development does not increase the flow rate at Eagleview Road and Goodsell Street and hence the development does not increase the risk of flooding downstream of the development site including Goodsell Street and Eagleview Road.

Further refinement of the above design treatment elements should be undertaken at the detailed design phase when geotechnical information is available, and once the pit and pipe system has been designed and modelled.

We trust the foregoing is suitable for your consideration. Should you have any issues you wish clarified please do not hesitate to contact us.

Yours truly,

Arun Shrestha

Arun Shrestha, B.E. (Civil), MIEAust, CPEng, RPEQ, RBP
Civil/ Structural Engineer

FUSION Engineering Services

ENGINEERS AUSTRALIA Chartered Professional Engineer MEMBER

REGISTERED Building Practitioner

Board of Professional Engineers Queensland Government

Appendix A

Concept Development


Canopy Planting Strip
JERSEY PARADE
GOODSELL
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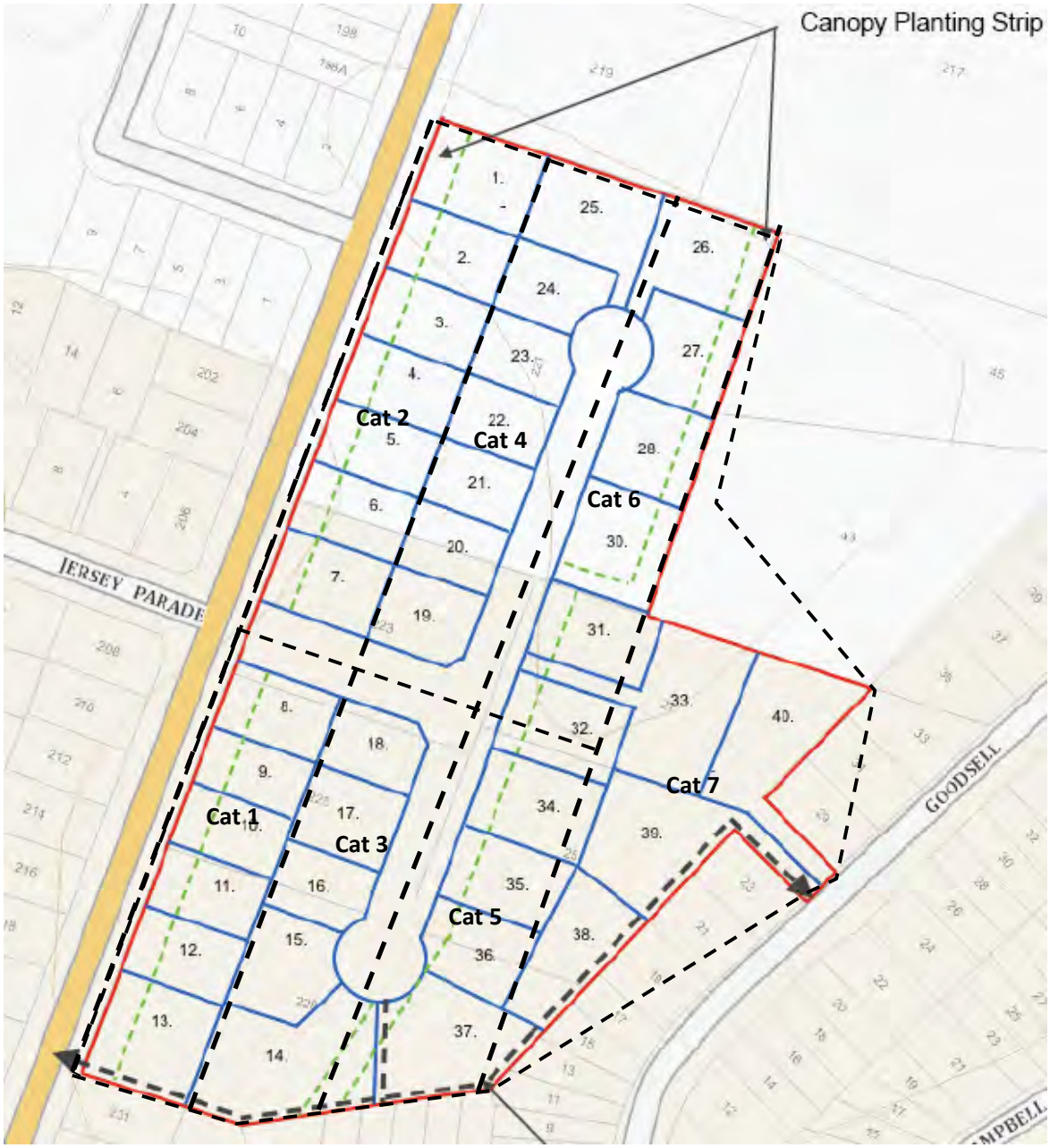
Appendix B

Stormwater Management Concept Plan

Appendix C

Catchment Plan

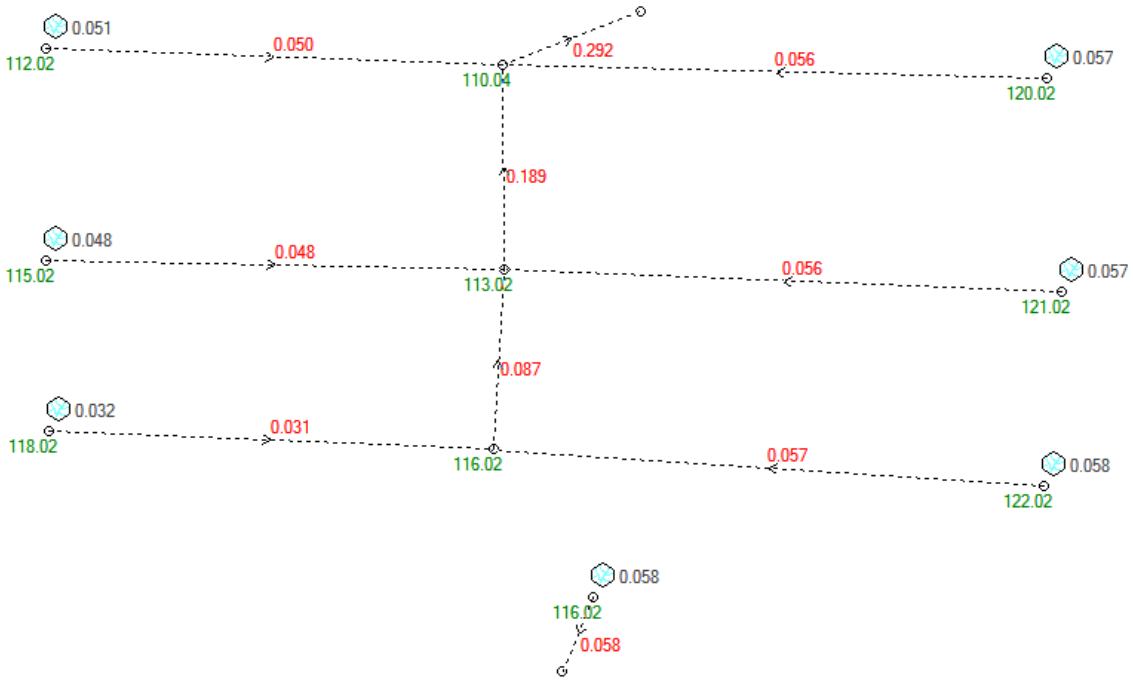

Canopy Planting Strip
Cat 1
Cat 2
Cat 3
Cat 4
Cat 5
Cat 6
Cat 7
JERSEY PARADE
GOODSELL

Appendix D

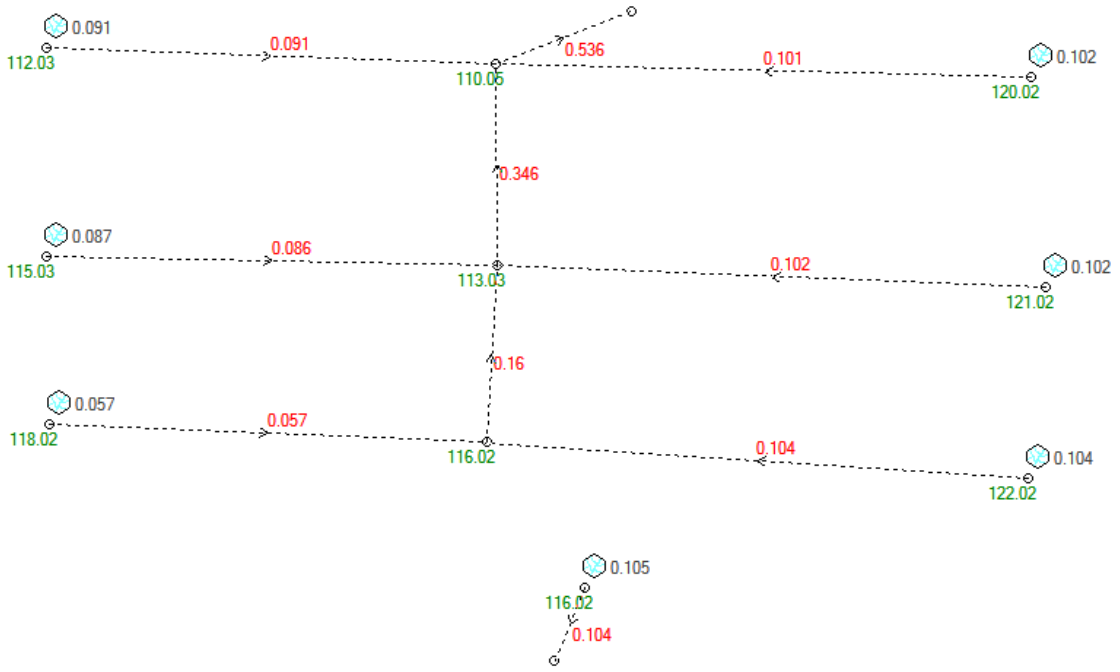
DRAINS Model Result

Pre Development

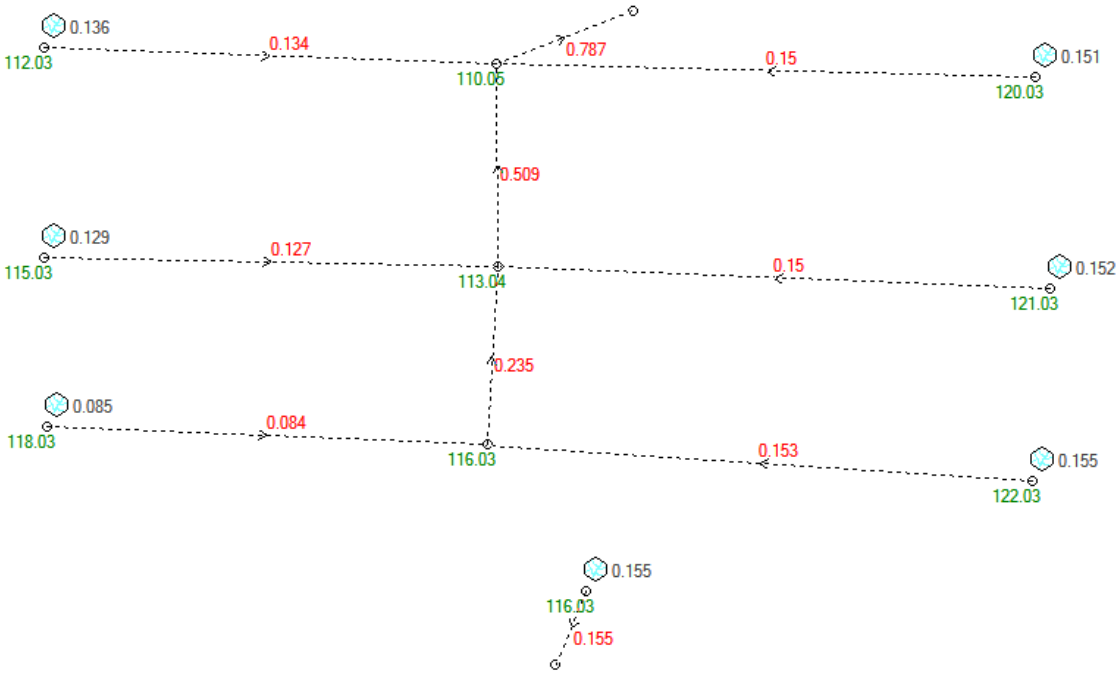
5 Year ARI



20 Year ARI

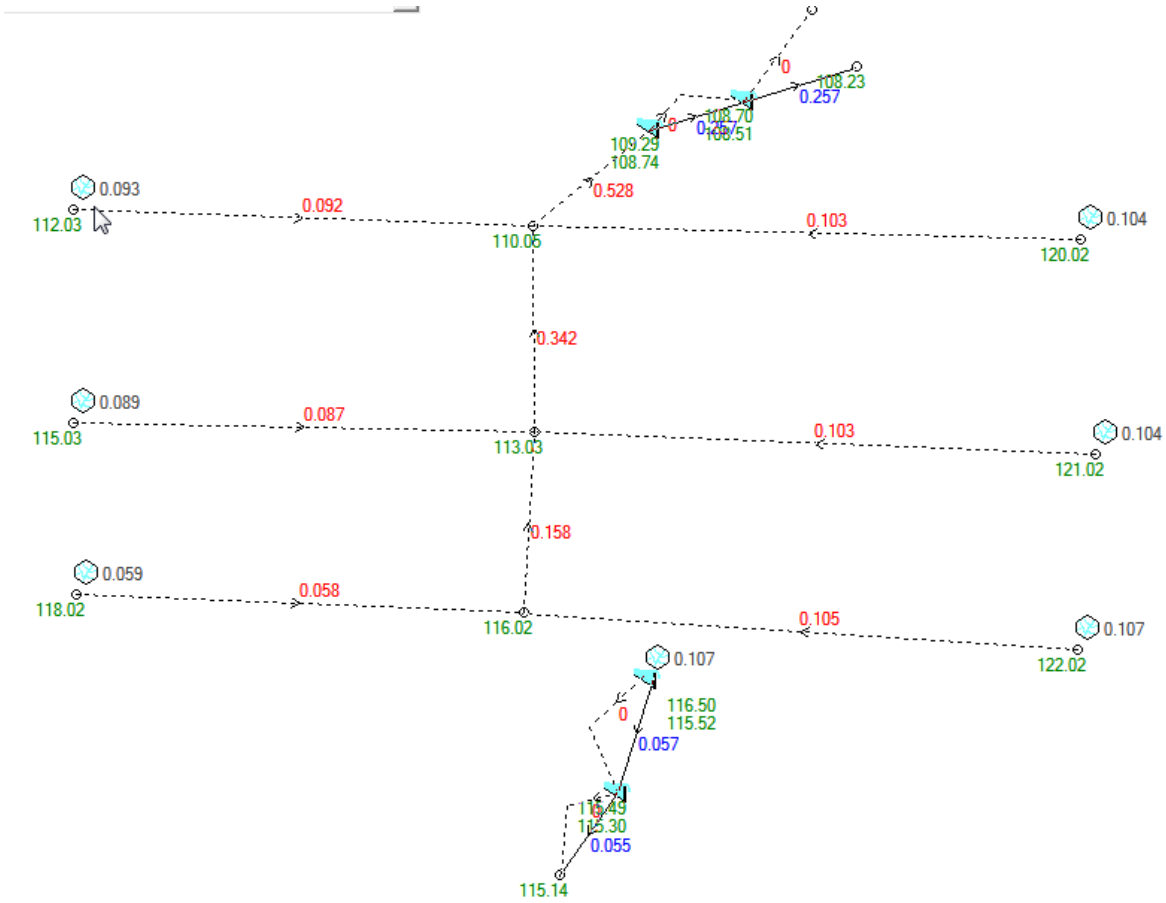


100 Year ARI



Post Development

5 Year ARI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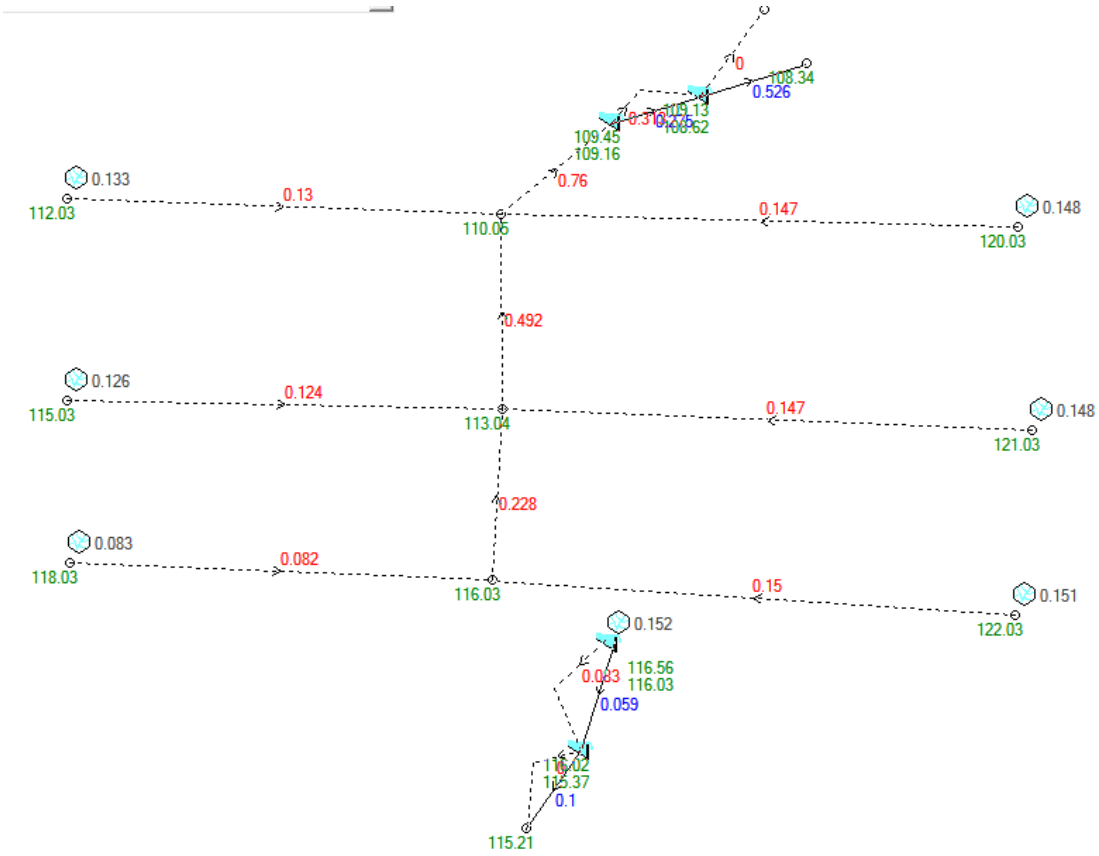
20 Year ARI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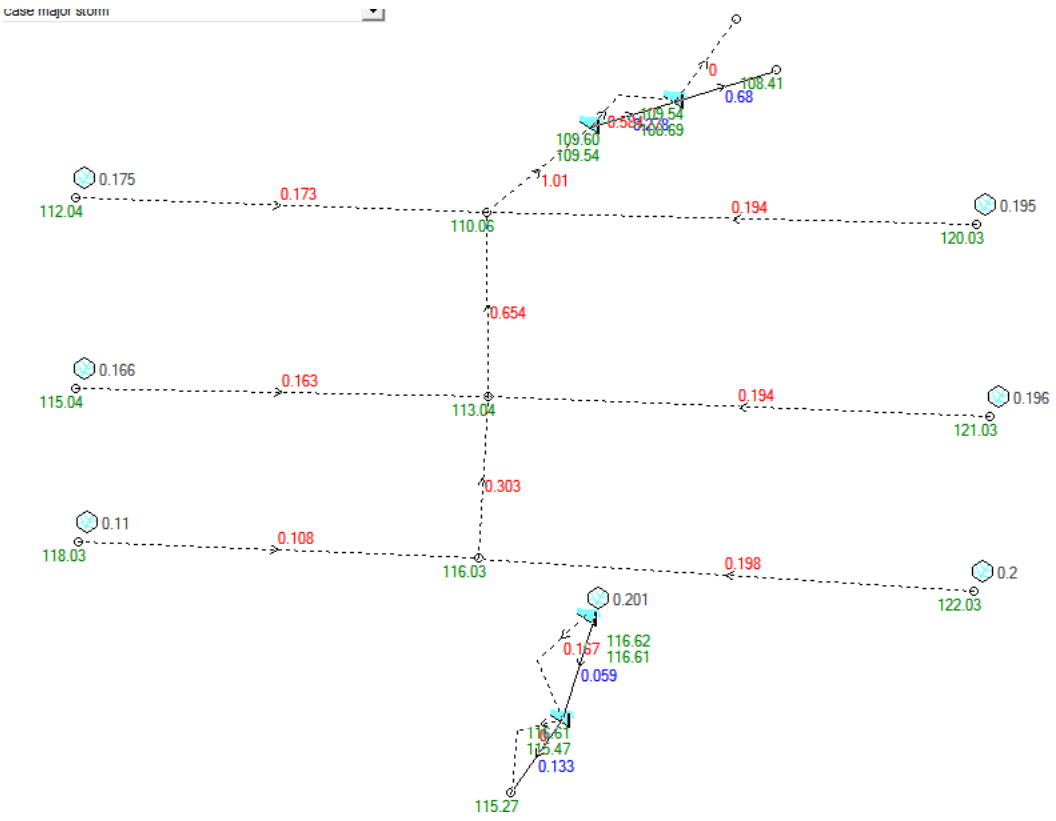
100 year ARI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Appendix E

ECOSOL GPT Technical Specification

Intersect Traffic - Preliminary Traffic Advice

August 2016

PRELIMINARY TRAFFIC ADVICE

RESIDENTIAL PLANNING PROPOSAL

LOTS 1, 2, 10 & 11 DP 719990, LOT 4 DP 539244 & LOT 100 DP 706378

221, 223, 225 & 229 EAGLEVIEW ROAD AND 25 & 27 GOODSELL STREET, MINTO

PREPARED FOR: TANGIBLE PLANNING SOLUTIONS

AUGUST 2016

REF: 16/004

PRELIMINARY TRAFFIC ADVICE
RESIDENTIAL PLANNING PROPOSAL
LOTS 1, 2, 10 & 11 DP 719990, LOT 4 DP 539244 & LOT 100 DP 706378
221, 223, 225 & 229 EAGLEVIEW ROAD & 25 & 27 GOODSELL STREET, MINTO

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QUALITY ASSURANCE

This document has been prepared, checked and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
A	04/02/16	Draft	JG
B	11/02/16	Edit	JG
C	18/02/16	Final Proof	JG
D	22/02/16	Approved	JG
E	30/09/16	Additional Lot Yield	JG

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SIGNATURE HAS BEEN REMOVED

This document has been authorised by

Date 30th August 2016

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CONTENTS

ATTACHMENTS

PHOTOGRAPHS

FIGURES

TABLES

1. INTRODUCTION

Intersect Traffic Pty Ltd has been engaged by Tangible Planning Solutions to undertake a preliminary desktop traffic assessment for the proposed rezoning of Lots 1, 2, 10 & 11 DP 719990, Lot 4 DP 539244 & Lot 100 DP 706378 – 221, 223, 225 & 229 Eagleview Road and 25 & 27 Goodsell Street, Minto from an E4 Environmental Management zoning to an R2 Low Density Residential Zoning that would allow lot sizes down to 450 m^2 in area. The rezoning would allow the site to be subdivided with a potential lot yield of up to 40 lots. This traffic assessment is required to support a planning proposal to Campbelltown City Council.

The purpose of this document is to undertake a preliminary assessment of the likely traffic impacts of the proposal on the local road network and associated roadside infrastructure to allow Council to assess the merits of the planning proposal. The document will also advise Council and the applicant of the likely traffic issues that will need to be addressed should the proposal obtain a gateway determination.

2. DEVELOPMENT PROPOSAL

2.1 Site Location

The site is located on the eastern side of Eagleview Road between Eagleview Road and Goodsell Street Minto approximately 200 metres north of Westmoreland Street. ***Figure 1*** below shows the site location from a local context.

The site consists of six separately titled and addressed lots as described below and has an area of approximately 3.8 hectares.

- Lot 100 DP 706378 – 229 Eagleview Road, Minto;
- Lot 4 DP 539244 – 221 Eagleview Road, Minto;
- Lot 1 DP 719990 – 223 Eagleview Road, Minto;
- Lot 2 DP 719990 – 225 Eagleview Road, Minto;
- Lot 10 DP 719990 – 25 Goodsell Street, Minto; and
- Lot 11 DP 719990 – 27 Goodsell Street, Minto.

The site currently contains six residential dwellings (one on each lot) as well as a number of improvements and sheds. ***Photograph 1*** below shows the existing site conditions.

Each lot currently has a single urban standard access crossing to either Eagleview Road or Goodsell Street. 25 & 27 Goodsell Street currently access the road reserve via an access handle with separate driveways servicing each dwelling as shown in ***Photograph 2*** below.

Surrounding development to the east, south and west comprises low density residential dwellings while to the north land is characterised by large lot residential development.

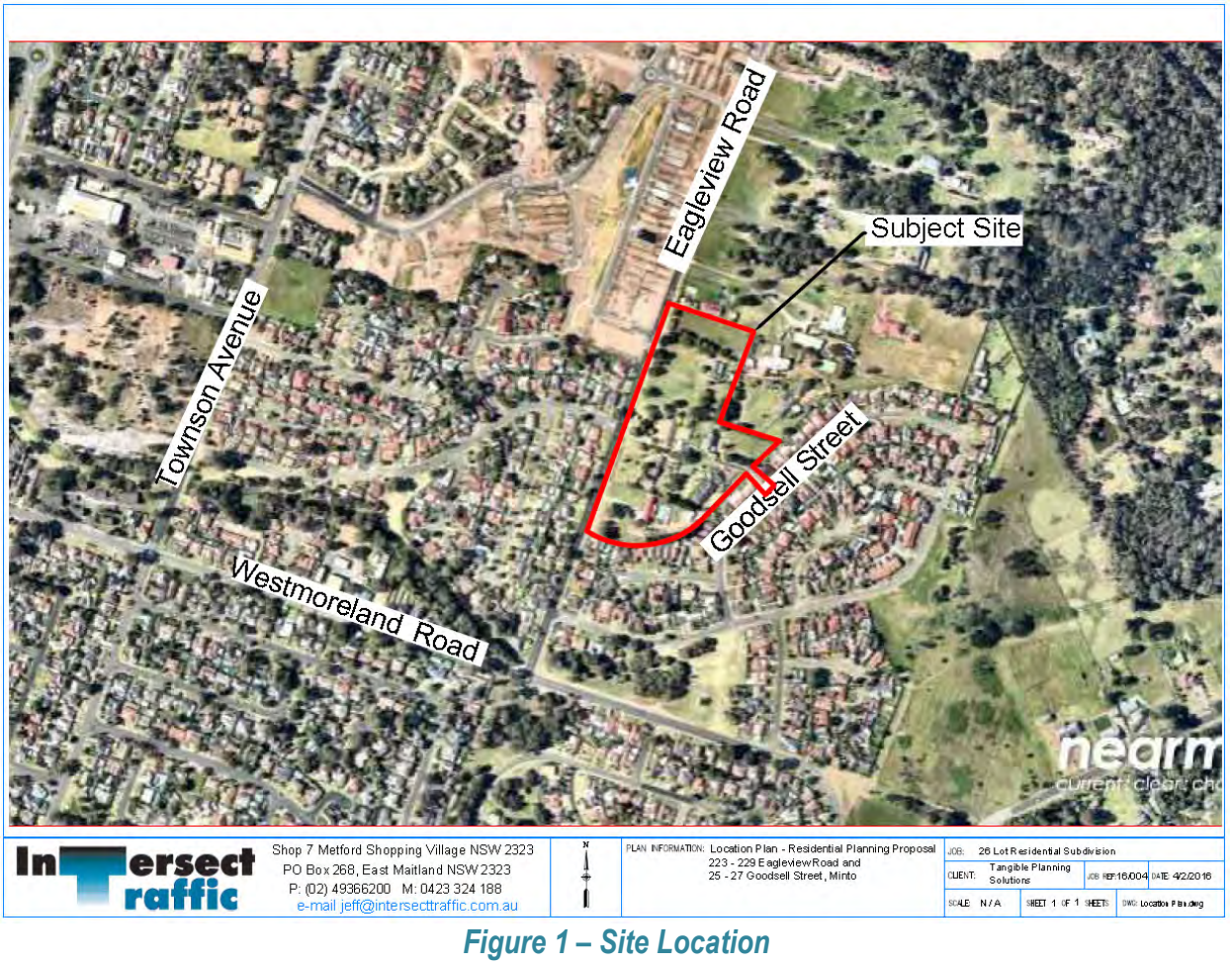


Figure 1 – Site Location

Photograph 1 – Existing site conditions.

Photograph 2 – Existing vehicular access to 25 & 27 Goodsell Street.

2.2 Development Proposal

The proposal involves the rezoning of the site from an E4 Environmental Management zoning to an R2 Low Density Residential Zoning that would allow lot sizes down to 450 m^2 in area. The rezoning would allow the site to be subdivided with a potential lot yield of up to 40 lots.

No preliminary concept plan was available at the time of preparation of this report. Once a gateway approval is provided a development concept plan will be prepared for further consideration and assessment during the future stages of the planning proposal application process.

2.3 Existing Road Network

In terms of the local road network, the roads that will be mainly impacted by the additional traffic generated by the development are;

- Eagleview Road;
- Goodsell Street;
- Ben Lomond Drive; and
- Westmoreland Road.

These roads are all local urban roads providing a single travel lane in both directions with lane widths in excess of 3.5 metres and kerb and gutter. Ben Lomond Drive has a central landscaped median to separate traffic flows and indented on-street car parking lanes. Typical carriageway widths are;

- Eagleview Road – 11 metres;
- Goodsell Street – 7.5 metres;
- Ben Lomond Drive (including parking lanes) – 15 metres; and
- Westmoreland Road – 11.5 metres.

Goodsell Street under a functional road hierarchy is likely to be classified as an urban local street providing vehicular access to local streets while Eagleview Road, Ben Lomond Drive and Westmoreland Road could be classified as urban collector roads collecting and distributing the local traffic to the sub-arterial road network. From the desktop assessment these roads appear to be in fair to good condition and a 50 km/h speed zoning exists through the area except at the variable school speed zoning site on Westmoreland Road west of the site. ***Photographs 3, 4 & 5*** below show these roads in the vicinity of the site.

Photograph 3 – Eagleview Road in the vicinity of the site.

Photograph 4 – Goodsell Street in the vicinity of the site.

Photograph 5 – Westmoreland Road in the vicinity of the site.

2.4 Traffic Generation

Traffic generation data for this preliminary assessment report has been sourced from the NSW Roads and Maritime Services (RMS') *Technical Direction TDT 2013/04* which provides the following specific advice on the traffic generation potential of low density residential dwellings.

Rates:

Daily vehicle trips = Average 10.7 per dwelling in Sydney.
PM peak (1) hour = 0.99 per dwelling in regional areas. (Maximum 1.39)
AM peak (1) hour = 0.95 per dwelling in regional areas. (Maximum 1.32)

Given the expected maximum lot yield from the proposal is 40 lots i.e. an additional 34 lots and adopting the maximum values for AM and PM peak hour generation the proposal is likely to generate the following traffic volumes onto the existing road network;

Daily vehicle trips	= 34 x 10.7	= **364 vtpd.**
PM peak hour trips	= 34 x 1.39	= **48 vtph.**
AM peak hour trips	= 34 x 1.32	= **45 vtph.**

Note: - A more detailed traffic generation analysis will be carried out as part of the Traffic Impact Assessment report at a future stage in the planning process. This will accommodate any changes to the planning proposal as a result of further planning of the development and the adoption of a final concept plan.

2.5 Traffic Impacts and Considerations

2.5.1 Road Network Capacity

The capacity of the road network is generally determined by the capacity of intersections. However, Tables 4.3 and 4.4 of the RMS' *RTA Guide to Traffic Generating Developments* provide some guidance on mid-block capacities for urban roads and likely levels of service. These tables are reproduced below.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Further Table 4.6 of the RMS' *RTA Guide to Traffic Generating Developments* provides some guidance on environmental capacity goals for urban roads to ensure residential amenity in the area remains at acceptable levels. This table is also reproduced below.

Table 4.6
Environmental capacity performance standards on residential streets

Road class	Road type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

Urban road mid-block capacity and environmental capacity at the site is thus calculated based on these tables and assuming the following site specific variables;

- LoS C being considered satisfactory as local roads.
- They are undivided roads and each lane is considered an inner lane.
- Functionally Eagleview Road, Westmoreland Road and Ben Lomond Drive are collector roads and Goodsell Street is a local street.

Utilising Tables 4.3, 4.4 and 4.6 of the RMS' *RTA Guide to Traffic Generating Developments* the respective capacities of the affected roads are as shown in ***Table 1*** below.

Table 1 – Road Network Capacity.

Road	Two-way mid-block capacity (vtph)	Environmental capacity maximum (vtph)
Eagleview Road	1,800	500
Goodsell Street	1,800	300
Ben Lomond Drive	1,800	500
Westmoreland Road	1,800	500

To gain a preliminary understanding of traffic volumes on the local road network Intersect Traffic undertook two thirty minute traffic counts during the PM peak period on Tuesday 16th February 2016 at the Eagleview Road / Westmoreland Road intersection and the Pembroke Road / Westmoreland Road intersections. The tally sheets for these counts are included as ***Attachment B***. Further observation of traffic flows in Goodsell Street and Ben Lomond Drive during this same peak period was also undertaken though no recording of traffic volumes was undertaken. The traffic volumes adopted in this preliminary assessment from these limited traffic counts and observations would need to be confirmed within a more detailed traffic impact assessment carried out later in the rezoning process with individual intersection counts during peak AM and PM traffic periods at these intersections and the Ben Lomond Drive / Eagleview Road roundabout. The adopted traffic data used in this assessment is shown in ***Table 2*** below.

Table 2 –Traffic volume estimates – local road network

Road	PM peak hour (vtph)
Eagleview Road	284
Goodsell Street	< 100
Ben Lomond Drive	< 500
Westmoreland Road	316

It has been assumed that 90 % of the new lots would access Eagleview Road and only 10% of the new lots would access Goodsell Street via private access handles and that 50 % of all new traffic would utilise Westmoreland Road to access the higher function road network and 50 % of traffic would utilise Ben Lomond Drive to access the Minto shops and higher function road network. The additional traffic volumes expected (critical PM period) on each road would be;

- Goodsell Street – 5 vtph;
- Eagleview Road – 43 vtph;
- Ben Lomond Drive – 24 vtph; and
- Westmoreland Road – 24 vtph.

Adding this additional traffic to the estimated existing traffic volumes results in the following post development traffic volumes on the local road network;

- Goodsell Street – < 100 vtph;
- Eagleview Road – 327 vtph;
- Ben Lomond Drive - < 500 vtph; and
- Westmoreland Road – 340 vtph.

This preliminary assessment indicates that all these roads will remain below the environmental capacity guidelines post development and continue to do so even with normal background traffic growth (1% per annum) over ten years

Noting that the additional traffic generated by the proposal is also generally in the vicinity of 10 % - 15 % of existing traffic volumes it is reasonable to conclude that on its own such a traffic volume increase would not be expected to adversely impact on the wider road network.

A more stringent road network capacity analysis would however need to be carried out in a future traffic impact assessment should this planning proposal proceed past gateway determination.

2.5.2 Intersection Capacity

No intersection capacity analysis has been carried out for this preliminary assessment. By observation intersections within the vicinity of the site are all operating with satisfactory levels of service with little or any delay and vehicle queuing occurring.

The addition of only up to 24 vtph on any wider section of the road network would not be expected to impact on the operation of these intersections particularly as the additional traffic on these intersections would represent less than 10 % of existing traffic volumes. This will be demonstrated through Sidra modelling of key intersections within a more thorough traffic impact assessment report undertaken at a future stage of the planning process.

2.5.3 On-site parking

The planning proposal is to allow residential development on the site and as such does not itself generate an on-site car parking demand. Future development of the land to provide residential dwellings will generate the on-site car parking demand and assessment of the proposed on-site car parking supply needs to be carried out at the development application stage for construction of the residential dwellings.

However the proposed subdivision will result in lot sizes will in excess of the minimum low density residential lot size of 450 m^2 and these are considered large enough to allow on-site car parking to be provided on each lot in accordance with Campbelltown City Council's DCP requirements for at least a single dwelling house.

2.5.4 Public transport & alternate transport modes

As a residential planning proposal the development has the potential to increase public transport usage as well as external pedestrian and bicycle traffic. However the scale of the development is relatively small therefore the increased public transport usage and alternate transport mode traffic increase is not likely to be significant. Therefore improvements to infrastructure and public transport services are unlikely to be warranted.

Public transport in the area is provided by Interline Bus Services with Route 881 (Campbelltown to Leumeah North Loop) being the most convenient though Routes 870, 871 and 872 (Campbelltown to Liverpool services) also pass within convenient walking distance (670 metres) to the site. Route maps for these routes are provided in ***Attachment A***. There are bus stops with shelters and seats located immediately south of the site on Westmoreland Road (see ***Photograph 6*** below). There would not be sufficient additional demand within the proposal that is likely to require a change to the current public transport service.

There is little in the way of existing concrete pedestrian footpaths along Eagleview Road, Goodsell Street and Westmoreland Road (isolated sections only) with pedestrians currently using the grass verges or sharing the road shoulders/edges with all vehicles. The additional pedestrian demand from the development would not be expected to be such that it will require construction of new pedestrian footpaths in the area aside from the current requirements of Campbelltown City Council in regard to the site frontages.

Cyclists in the vicinity of the site are generally required to utilise the sealed shoulders or share travel lanes on all the local roads in the vicinity of the site. Again this is considered suitable for the level of additional demand generated by the proposal.

A more detailed assessment of alternate transport mode impacts will need to be carried out within the traffic impact assessment that is likely to be required at development application stage.

Photograph 6 – Bus Stop & Shelter – southern side of Westmoreland Road.

3. CONCLUSIONS

This preliminary traffic assessment for the proposed rezoning of Lots 1, 2, 10 & 11 DP 719990, Lot 4 DP 539244 & Lot 100 DP 706378 – 221, 223, 225 & 229 Eagleview Road and 25 & 27 Goodsell Street, Minto from an E4 Environmental Management zoning to an R2 Low Density Residential Zoning has concluded;

- The existing local road network has sufficient spare capacity to cater for the planning proposal.
- The additional traffic generated by the proposal is less than 15 % of existing traffic volumes therefore it is reasonable to conclude that on its own such a traffic volume increase would not adversely impact on the wider road network.
- The addition of up to 24 vtph on any section of the local road network would not be expected to adversely impact on the operation of adjoining intersections particularly as the additional traffic on these intersections will decrease markedly as traffic on the road network is distributed through the various travel routes to the site and represents less than 10 % of total traffic volumes through the intersections.
- With proposed lot sizes well in excess of the minimum 450 m^2 for low density residential being sought in the planning proposal it is considered this is large enough to allow on-site car parking to be provided on each lot in accordance with Campbelltown City Council's DCP requirements for at least a single dwelling house.
- The proposal has the potential to increase public transport usage. However, the scale of the development is relatively small therefore the increased public transport usage and alternate transport mode traffic increase is not likely to be significant. Therefore, improvements to infrastructure and public transport services are unlikely to be warranted.
- There are bus stops with shelters and seats located immediately south of the site that is within convenient walking distance to the site and being within 450 metres of the extremities of the site.
- The additional pedestrian demand from the development would not be expected to be such that it will require construction of new pedestrian footpaths in the area aside from the current requirements of Campbelltown City Council in regard to the site frontages.
- Cyclists in the vicinity of the site are generally required to utilise the sealed shoulders or share travel lanes on all the local roads in the vicinity of the site. Again this is considered suitable for the level of additional demand generated by the proposal.

4. RECOMMENDATION

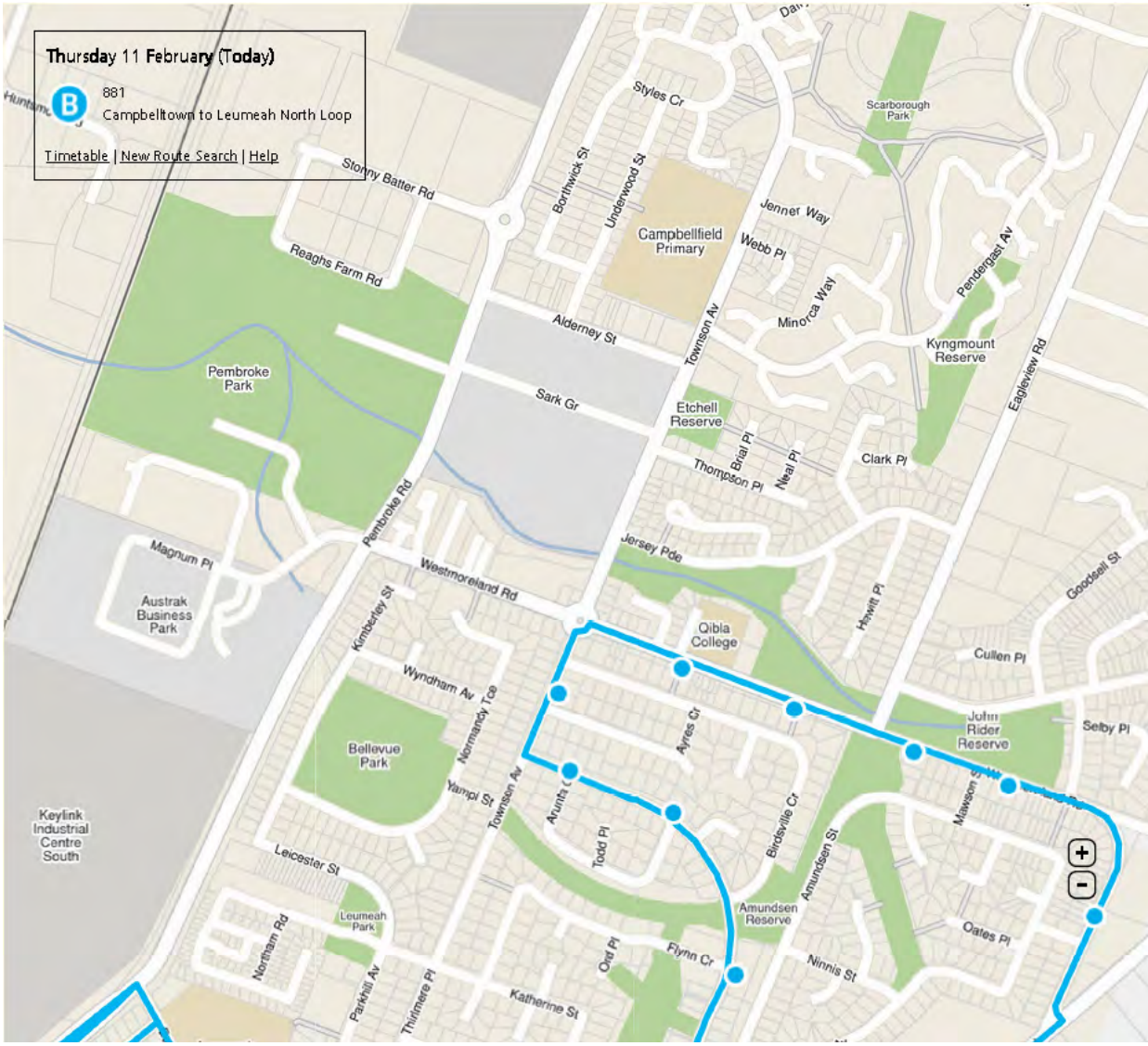
On the basis of this preliminary traffic assessment for the proposed rezoning of Lots 1, 2, 10 & 11 DP 719990, Lot 4 DP 539244 & Lot 100 DP 706378 – 221, 223, 225 & 229 Eagleview Road and 25 & 27 Goodsell Street, Minto from an E4 Environmental Management zoning to an R2 Low Density Residential Zoning it is recommended that the proposal can be supported as it is considered it would not adversely impact on the local road network and could meet all the requirements of Campbelltown City Council, RMS and Australian Standards.

SIGNATURE HAS BEEN REMOVED

JR Garry BE (Civil), S ***asters of Traffic***
Director
Intersect Traffic Pty Ltd

ATTACHMENT A
BUS ROUTE MAPS

881


Thursday 11 February (Today)
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Campbelltown to Leumeah North Loop
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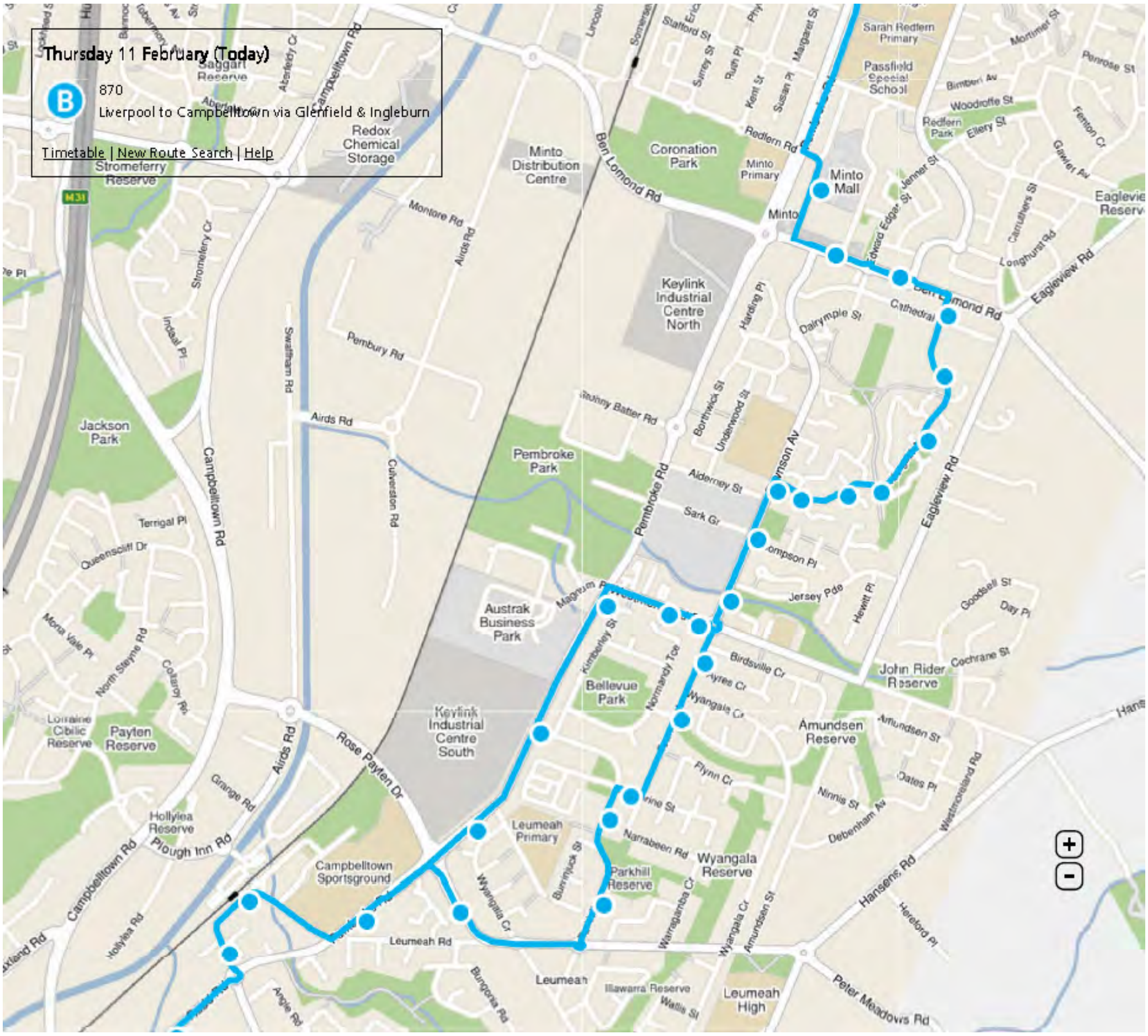
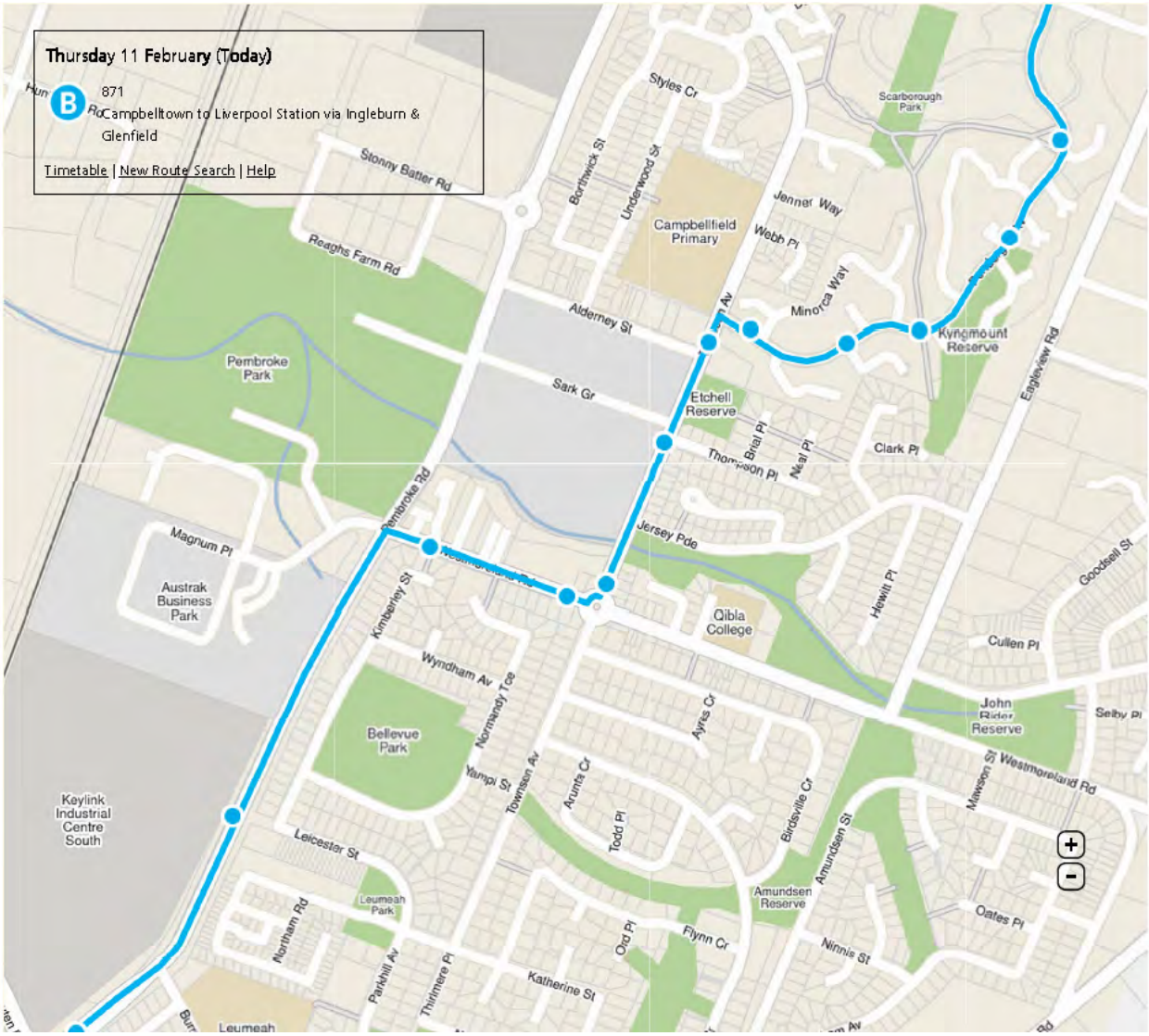
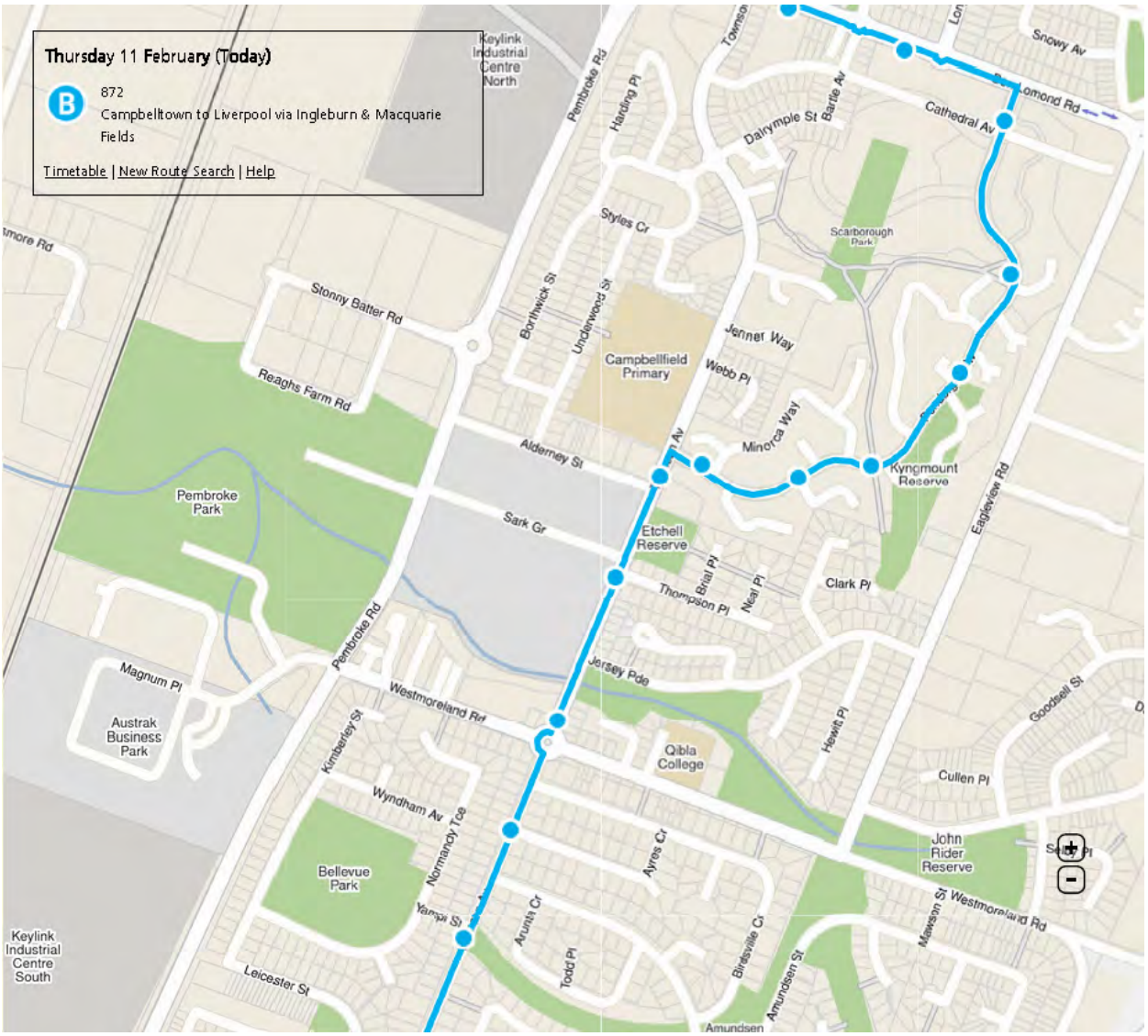
Stonny Batter Rd
Borthwick St
Underwood St
Jenner Way
Campbellfield Primary
Webb Pl
Reaghs Farm Rd
Minorca Way
Pendergast Av
Alderney St
Townson Av
Kyngmount Reserve
Pembroke Park
Sark Gr
Eagleview Rd
Etchell Reserve
Briat Pl
Neal Pl
Clark Pl
Thompson Pl
Pembroke Rd
Magnum Pl
Jersey Pde
Austrak Business Park
Westmoreland Rd
Kimberley St
Hewitt Pl
Goodsell St
Qibla College
Cullen Pl
Wyndham Av
Normandy Tce
Ayres Cr
John Rider Reserve
Selby Pl
Bellevue Park
Yampi St
Townson Av
Arunta Cr
Birdsville Cr
Mawson St
Keylink Industrial Centre South
Todd Pl
Amundsen St
Leicester St
Amundsen Reserve
Leumeah Park
Northam Rd
Oates Pl
Flynn Cr
Ord Pl
Ninnis St
Parkhill Av
Thirlmere Pl
Katherine St


Thursday 11 February (Today)
870
Liverpool to Campbelltown via Glenfield & Ingleburn
Timetable | New Route Search | Help
Saggart Reserve
Redox Chemical Storage
Stromeferry Reserve
Minto Distribution Centre
Coronation Park
Minto Primary
Minto Mall
Sarah Redfern Primary
Passfield Special School
Redfern Park
Eaglevie Reserv
Keylink Industrial Centre North
Jackson Park
Pembroke Park
Austrak Business Park
Bellevue Park
Keylink Industrial Centre South
John Rider Reserve
Amundsen Reserve
Lorraine Cibilic Reserve
Payten Reserve
Hollylea Reserve
Leumeah Primary
Campbelltown Sportsground
Parkhill Reserve
Wyangala Reserve
Leumeah
Leumeah High
Illawarra Reserve
Ben Lomond Rd
Montore Rd
Pembury Rd
Airds Rd
Campbelltown Rd
Pembroke Rd
Eagleview Rd
Rose Payten Dr
Plough Inn Rd
Leumeah Rd
Hansens Rd
Peter Meadows Rd
Swaffham Rd
Culverston Rd
Stromeferry Cr
Queenscliff Dr
Terrigal Pl
Grange Rd
Narrabeen Rd
Flynn Cr
Birdsville Cr
Wyangala Cr
Jersey Pde
Alderney St
Sark Gr
Dalrymple St
Cathedral
Longhurst Rd
Woodroffe St
Ellery St
Redfern Rd
Coachrane St
Amundsen St
Oates Pl
Ninnis St
Debenham Av
Hereford Pl
Goodsell St
Day Pl
Hewitt Pl
Borthwick St
Underwood St
Harding Pl
Kimberley St
Normandy Tce
Burrinjuck St
Warragamba Cr
Amundsen St
Westmoreland Rd
Bungonia Rd
Angle Rd
Hollylea Rd
Mona Vale Pl
North Steyne Rd
Collaroy Rd
Indaal Pl
Stafford St
Surrey St
Kent St
Susan Pl
Margaret St
Ruth Pl
Mortimer St
Penrose St
Bimbieri Av
Fenton Cr
Gawler Av
Carruthers St
Jenner St
Minto

871


Thursday 11 February (Today)
B
871
Campbelltown to Liverpool Station via Ingleburn & Glenfield
Timetable | New Route Search | Help
Stonny Batter Rd
Reaghs Farm Rd
Styles Cr
Scarborough Park
Bonthwick St
Underwood St
Campbellfield Primary
Jenner Way
Webb Pl
Minorca Way
Kyngmount Reserve
Eagleview Rd
Alderney St
Sark Gr
Pembroke Park
Etchell Reserve
Thompson Pl
Brial Pl
Neal Pl
Clark Pl
Pembroke Rd
Jersey Pde
Magnum Pl
Austrak Business Park
Kimberley St
Qibla College
Hewitt Pl
Goodsell St
Cullen Pl
Wyndham Av
Normandy Tce
Bellevue Park
Ayris Cr
John Rider Reserve
Selby Pl
Yampi St
Townsson Av
Arunta Cr
Todd Pl
Birdsville Cr
Mawson St
Westmoreland Rd
Keylink Industrial Centre South
Leicester St
Amundsen St
Amundsen Reserve
Leumeah Park
Northam Rd
Oates Pl
Old Pl
Flynn Cr
Ninnis St
Parkhill Av
Thirlmere Pl
Katherine St
Leumeah

872

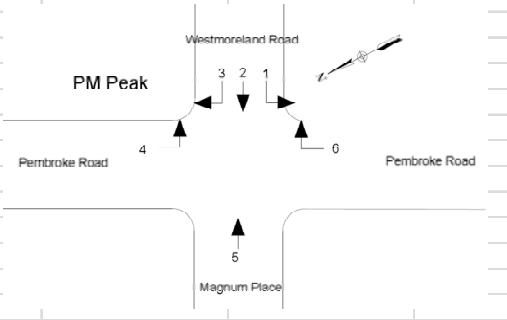

Thursday 11 February (Today)
B
872
Campbelltown to Liverpool via Ingleburn & Macquarie Fields
Timetable | New Route Search | Help
Keylink Industrial Centre North
Pembroke Rd
Harding Pl
Townsend
Snowy Av
Lomond Rd
Dairymple St
Bartle Av
Cathedral Av
Styles Cr
Scarborough Park
Stonny Batter Rd
Borthwick St
Underwood St
Campbellfield Primary
Jenner Way
Webb Pl
Reaghs Farm Rd
Minorca Way
Kyngmount Reserve
Alderney St
Pembroke Park
Sark Gr
Etchell Reserve
Eagleview Rd
Thompson Pl
Brial Pl
Neal Pl
Clark Pl
Magnum Pl
Austrak Business Park
Westmoreland Rd
Jersey Pde
Goodsell St
Kimberley St
Qibla College
Hewitt Pl
Cullen Pl
Wyndham Av
Normandy Tce
Ayres Cr
John Rider Reserve
Bellevue Park
Yampi St
Aruntis Cr
Todd Pl
Birdsville Cr
Amundsen St
Mawson St
Keylink Industrial Centre South
Leicester St
Amundsen

ATTACHMENT B
TRAFFIC COUNT DATA

Date	16/02/2016
Day	Tuesday
Time	4:30pm - 5:00pm
Weather	Fine
Conducted by:	Jeff

MOVEMENT	1	2	3	4	5	6
4:30 - 4:45	28	0	2	12	1	31
4:45 - 5:00	30	0	6	8	1	39
SUM	58	0	8	20	2	70
PEAK	58	0	8	20	2	70

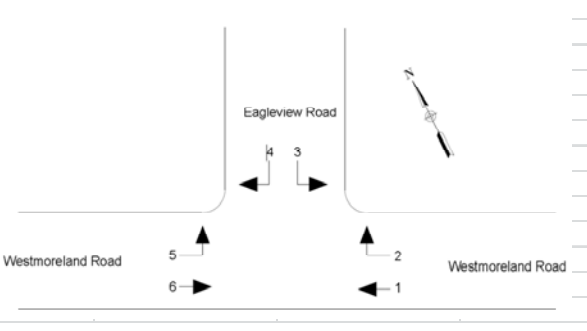
Leg	PHT (vph)
Westmoreland Road	316



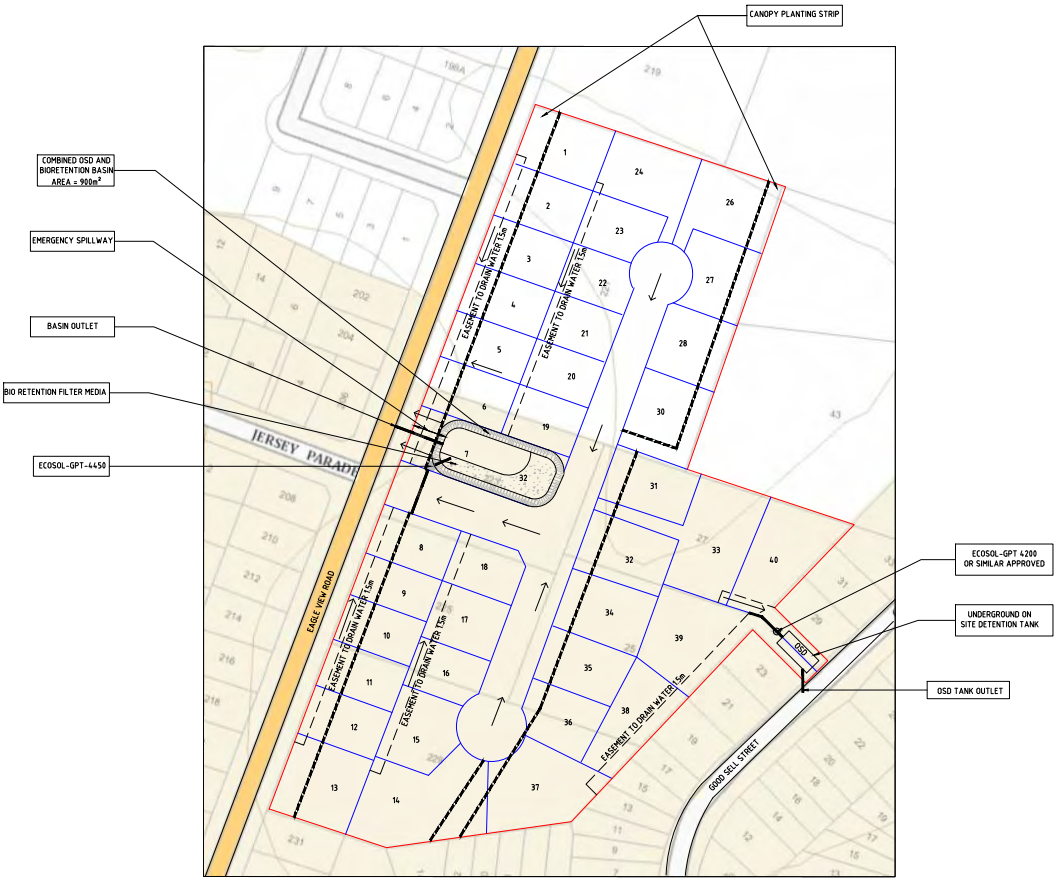
Date	16/02/2016
Day	Tuesday
Time	4 pm - 4.30 pm
Weather	Fine
Conducted by:	Jeff

MOVEMENT	1	2	3	4	5	6
4:00 - 4:15	5	10	15	25	17	17
4:15 - 4:30	9	10	19	20	26	5
SUM	14	20	34	45	43	22
PEAK	14	20	34	45	43	22

Leg	PHT (vph)
Eagleview Road	284
Westmoreland east	180
Westmoreland west	248



Stormwater Concept Plan



STORMWATER CONCEPT PLAN

SCALE = 1:200

NO.	REVISION	DATE

FUSION Engineering Services

CAMPSIE, SYDNEY

MOONEE PONDS, MELBOURNE

DESIGNED BY: RD

DRAWN BY: AP

APPROVED BY: AS

CLIENT
TANGIBLE PLANNING SOLUTIONS

PROJECT TITLE
PROPOSED STORMWATER DRAINAGE DESIGN

DRAWING TITLE
STORMWATER CONCEPT PLAN

DATE:	DWG NO:
12-09-2016	2016-2121
SCALE:	SHEET NO:
AS NOTED	S1