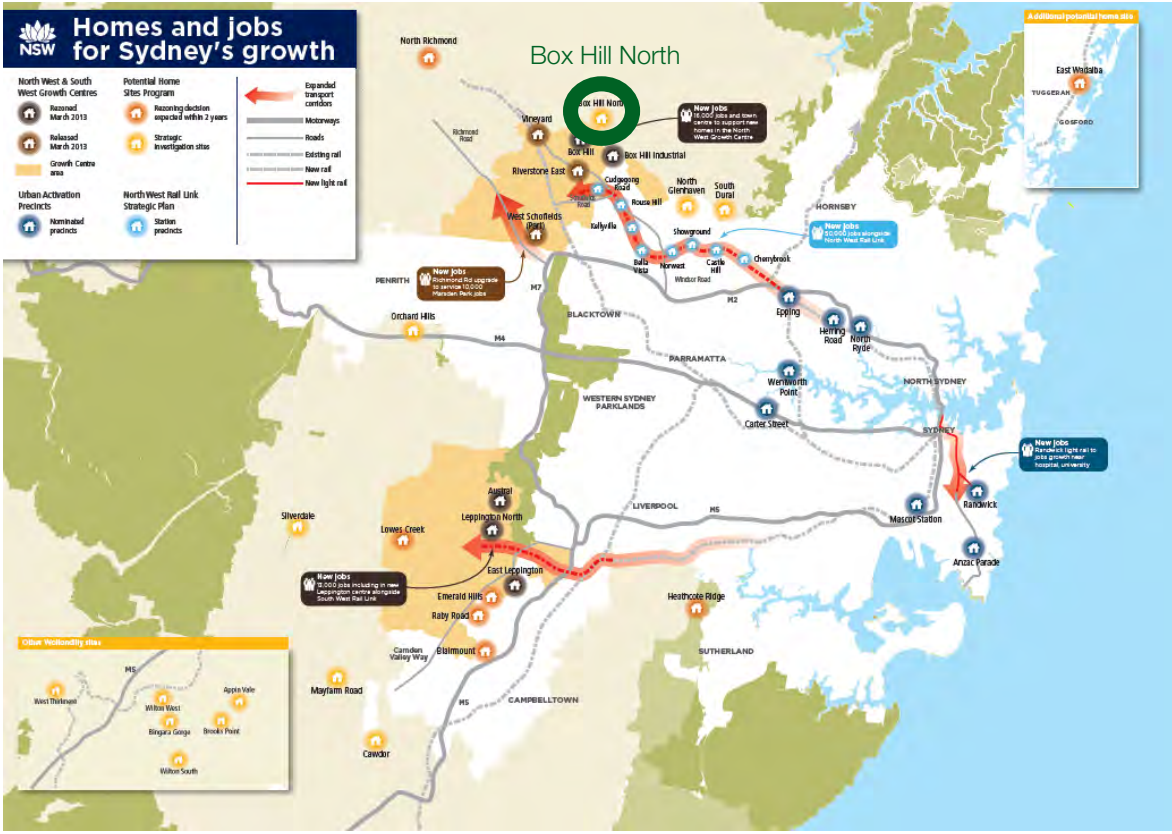
Box Hill Water

Appendix 3.2.5(a) Development Location


NSW
Homes and jobs for Sydney's growth
North West & South West Growth Centres
Rezoned March 2013
Released March 2013
Growth Centre area
Potential Home Sites Program
Rezoning decision expected within 2 years
Strategic investigation sites
Urban Activation Precincts
Nominated precincts
North West Rail Link Strategic Plan
Station precincts
Expanded transport corridors
Motorways
Roads
Existing rail
New rail
New light rail
Box Hill North
North Richmond
Richmond Road
Vineyard
Box Hill
Box Hill Industrial
Riverstone East
Cudgegong Road
Rouse Hill
North Glenhaven
South Dural
West Schofields (part)
Yallaylla
Showground
Bella Vista
Norwest
Castle Hill
Cherrybrook
Windsor Road
New jobs
15,000 jobs and town centre to support new homes in the North West Growth Centre
New jobs
30,000 jobs alongside North West Rail Link
New jobs
Richmond Rd upgrade to service 10,000 Marsden Park jobs
PENRITH
M7
M2
Orchard Hills
M4
BLACKTOWN
PARRAMATTA
Epping
Herring Road
North Ryde
Wentworth Point
NORTH SYDNEY
Carter Street
SYDNEY
WESTERN SYDNEY PARKLANDS
New jobs
Randwick light rail to jobs growth near hospital, university
Mascot Station
Randwick
Anzac Parade
Austral
Leppington North
LIVERPOOL
M5
Silverdale
Lowes Creek
East Leppington
New jobs
17,000 jobs including in new Leppington centre alongside South West Rail Link
Emerald Hills
Raby Road
Heathcote Ridge
Camden Valley Way
Elderslie
SUTHERLAND
Mayfarm Road
CAMPBELLTOWN
Cawdor
Other Wollondilly sites
West Theresne
Wilton West
Apple Vale
Bingara Gorge
Brooks Point
Wilton South
Additional potential home site
East Windsor
TUGGERAH
GOSFORD
HORNSBY

Box Hill Water

Appendix 3.2.5(b) Development Masterplan and LWC Site

Box Hill North Precinct
Indicative Layout Plan

Key

- Precinct Boundary
- Retail / Mixed Use
- School
- Community Facilities
- Large Lot Residential
- Low/Medium Density Residential
- High Density Residential
- Environmental Living
- Environmental Conservation
- Open Space
- Sports Fields
- Creeks / Drainage
- Transmission Easement
- Future Link Roads

Scale

0 100 200 300 400 500

North

Proposed LWC site

Maguires Road

Red Gables Road

Boundary Road

Cataract Road

Janpieter Road

Old Pitt Town Road

Future Mt Carmel Road connection from Box Hill

Terry Road

Future Terry Road realignment

design iQ

shaping the urban canvas

Box Hill North Indicative Layout Plan

31102014 - Rev 7

Box Hill Water

Appendix 3.2.5(c) Box Hill Zoning Plan

The Hills Local Environmental Plan 2012

THE HILLS SHIRE COUNCIL

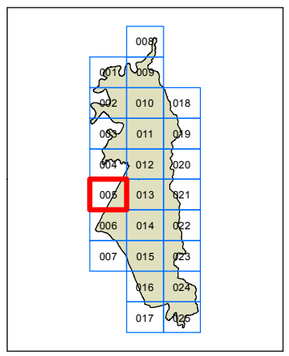
Land Zoning Map - Sheet LZN_005

Zone

B1	Neighbourhood Centre
B2	Local Centre
B4	Mixed Use
B5	Business Development
B6	Enterprise Corridor
B7	Business Park
E1	National Parks and Nature Reserves
E2	Environmental Conservation
E3	Environmental Management
E4	Environmental Living
IN1	General Industrial
IN2	Light Industrial
R1	General Residential
R2	Low Density Residential
R3	Medium Density Residential
R4	High Density Residential
RE1	Public Recreation
RE2	Private Recreation
RU1	Primary Production
RU2	Rural Landscape
RU3	Forestry
RU6	Transition
SP2	Infrastructure
SP3	Tourist
W2	Recreational Waterways
SRGC	SEPP (Sydney Region Growth Centres) 2006

Cadastre

Cadastre 15/10/2014 © THSC



N

0 75 150 300 450 600

Metres

Scale: 1:20,000 @ A3

Projection GDA 94
MGA Zone 56

Map Identification Number:
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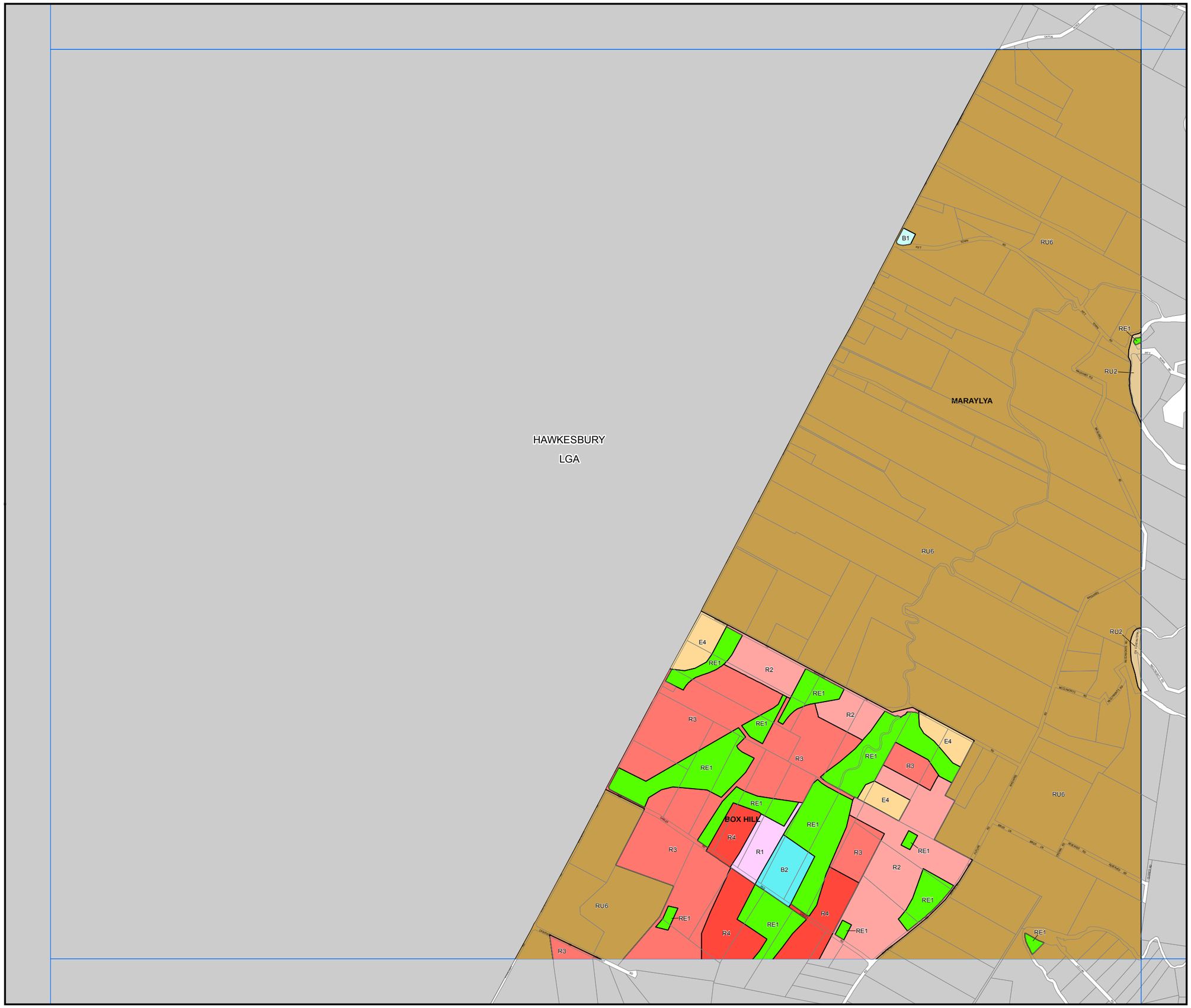


The Hills Local Environmental Plan 2012

THE HILLS SHIRE COUNCIL

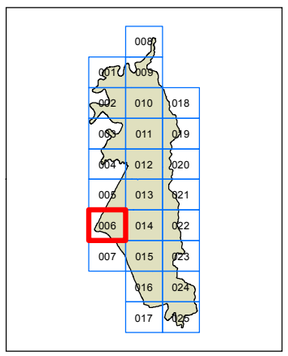
Land Zoning Map - Sheet LZN_006

Zone

B1	Neighbourhood Centre
B2	Local Centre
B4	Mixed Use
B5	Business Development
B6	Enterprise Corridor
B7	Business Park
E1	National Parks and Nature Reserves
E2	Environmental Conservation
E3	Environmental Management
E4	Environmental Living
IN1	General Industrial
IN2	Light Industrial
R1	General Residential
R2	Low Density Residential
R3	Medium Density Residential
R4	High Density Residential
RE1	Public Recreation
RE2	Private Recreation
RU1	Primary Production
RU2	Rural Landscape
RU3	Forestry
RU6	Transition
SP2	Infrastructure
SP3	Tourist
W2	Recreational Waterways
SRGC	SEPP (Sydney Region Growth Centres) 2006

Cadastre

Cadastre 15/10/2014 © THSC



N

0 75 150 300 450 600

Metres

Scale: 1:20,000 @ A3

Projection GDA 94
MGA Zone 56

Map Identification Number:
0500_COM_LZN_006_020_20150128

HAWKESBURY LGA

BLACKTOWN LGA

BOX HILL

NELSON

ROUSE HILL

SRGC

RU6

RU2

R3

R2

R4

RE1

B6

IN2

SP2 (LOCAL ROAD WIDENING)

SP2 (STORMWATER MANAGEMENT SYSTEM)

SP2 (PUBLIC TRANSPORT CORRIDOR)

Box Hill Water

Appendix 3.2.5(d) Proposed Development Staging

Planning Proposal

Box Hill North

July 2013

APP

Program & Project Delivery | Design & Technical Services | Real Estate | Independent Assurance Services | Consulting & Advisory

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This report has been prepared and reviewed in accordance with our quality control system. The report is preliminary draft unless it is signed below.

This report has been prepared by : **Elise Crameri**

Signature Date : 26/07/2013

This report has been reviewed by: **Allison Smith**

Signature Date : 26/07/2013

APP Corporation
www.app.com.au

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Executive Summary

Executive Summary

This Planning Proposal is submitted to The Hills Shire Council in support of an amendment to The Hills Local Environmental Plan 2012. The proposal is to rezone a 380 hectare parcel of land at Box Hill North to accommodate a new sustainable and high quality residential community comprising 4,100 dwellings, a 5.5 hectare town centre, active and passive open space, a school site, new roads and infrastructure.

The planning proposal includes a servicing and water strategy which demonstrates how this infrastructure is to be delivered to Box Hill North in a timely and efficient manner at no additional cost to government. It is accompanied by an offer to enter into a Voluntary Planning Agreement with State Government and Council for the delivery of infrastructure, services and utilities that are required to meet the future demands of Box Hill North. This includes road network improvements, 2.2 hectares of land for a primary school, 77 hectares of active and passive open space and a multi-purpose community centre.

The strategic justification for the rezoning of Box Hill North has been demonstrated by the identification of Box Hill North as a 'strategic investigation site' as part of the Department of Planning and Infrastructure's Potential Home Sites Program in March 2013, being seen as a 'strategic fit' in terms of planned growth and urban policy. Whilst the site was seen as a 'strategic fit', lack of enabling services and long lead in times and fragmented ownership posed a challenge for delivery. This has now been remedied with E.J. Cooper and Son Pty Ltd having secured agreements to purchase 86% of the site and 'in principal' support with Sydney Water in relation to forward funding enabling services.

There are sound planning reasons to support the rezoning of Box Hill North at this time when investment certainty, housing affordability and land supply are key issues of concern at the national, state and regional level. The successful development of Box Hill North will assist in meeting State government policy to release as much land to the market as quickly as possible. The project is consistent with and will assist in the delivery of key outcomes of the NSW State Plan and the North West Sub-Regional Strategy by contributing to the supply to market of appropriately located land to sustainably accommodate the projected housing and employment needs of the region's population and The Hills Shire which is required to provide 21,500 dwellings by 2031. As demonstrated throughout this planning proposal, the Box Hill North site is capable of speedy and well planned development with the first lots ready to be taken up in 2016.

The development will deliver a range of densities, lot sizes and dwelling types and create a diverse community that is demographically balanced. The variety of housing forms will provide opportunities to respond to changing life cycle, lifestyle and work requirements over time, enabling people to age in place.

The Vision

The Vision for Box Hill North is to create a new well-connected, living and diverse community that supports a vibrant town centre in the heart of the neighbourhood. Nestled within the undulating landform to the north of the recently release Box Hill and Box Hill Industrial Precincts, Box Hill North will establish the following key principles:

- creating a living and happy community;
- establishing a vibrant Town Centre;
- connecting the community; and
- growing a sustainable living environment.

Indicative Layout Plan

The Planning Proposal is supported by an Indicative Layout Plan (ILP), which represents the overall planning framework and preferred outcome for Box Hill North (refer to Figure 1). The ILP includes:

- approximately 290 hectares of residential land;
- a 5.5 hectare town centre incorporating a mix of retail, commercial and business uses capable of accommodating up to 10,000m2 of floor space;
- a 2.2 hectare new school site;
- new roads and infrastructure;
- sporting fields and parks;
- an integrated passive recreation area within a riparian corridor network; and
- land for environmental conservation.

Box Hill North will have its own identity primarily due to the ridgeline along Old Pitt Town Road that separates it from the Box Hill precinct. Being on the northern side of this ridgeline presents the site with an aspect that focuses on distant views of the Blue Mountains, bushland and a rural environment to the north, east and west. The urban structure has been designed to celebrate these features by incorporating them into a central parkland spine for the development, which converges in the centre of the site with a gathering place for the community. This gathering place being the active and passive parklands, wetland features, school and town centre which will incorporate retail and restaurants. The movement network is deliberate with the open space corridors being used as a means to travel to this precinct centre by walking or cycling. The open space linkages will be framed by higher density housing forms, which will focus around the town centre to increase people activity and make the most of the parkland setting for future residents to enjoy.

LEP Amendment and Development Control

It is proposed to rezone the site from RU6 Transition to R1 General Residential, R3 Medium Density, E2 Environmental Conservation, E3 Environmental Management, E4 Environmental Living, B2 Local Centre and RE1 Public Recreation under The Hills LEP 2012. As far as practical, the planning proposal incorporates the range of presently permissible land uses within the proposed land use zones together with a limited number of additional residential and other uses. This is to facilitate the delivery of 4,100 dwellings on the site contributing to the housing targets identified in strategic policies for the Sydney metropolitan area and the North West subregion. The Planning Proposal seeks to deliver the highest and best use of the land in the context with its environmental attributes through a “roll over” of existing controls where possible. The introduction of new site specific development standards and controls for Box Hill North has been limited to where an existing standard and control is an impediment to achieving the desired outcomes for Box Hill North.

A site specific Development Control Plan for Box Hill North has been prepared and is included as part of the Planning Proposal. The new Development Control Plan will guide the assessment of future detailed subdivision and built form proposals.

Strategic and Statutory Planning Considerations

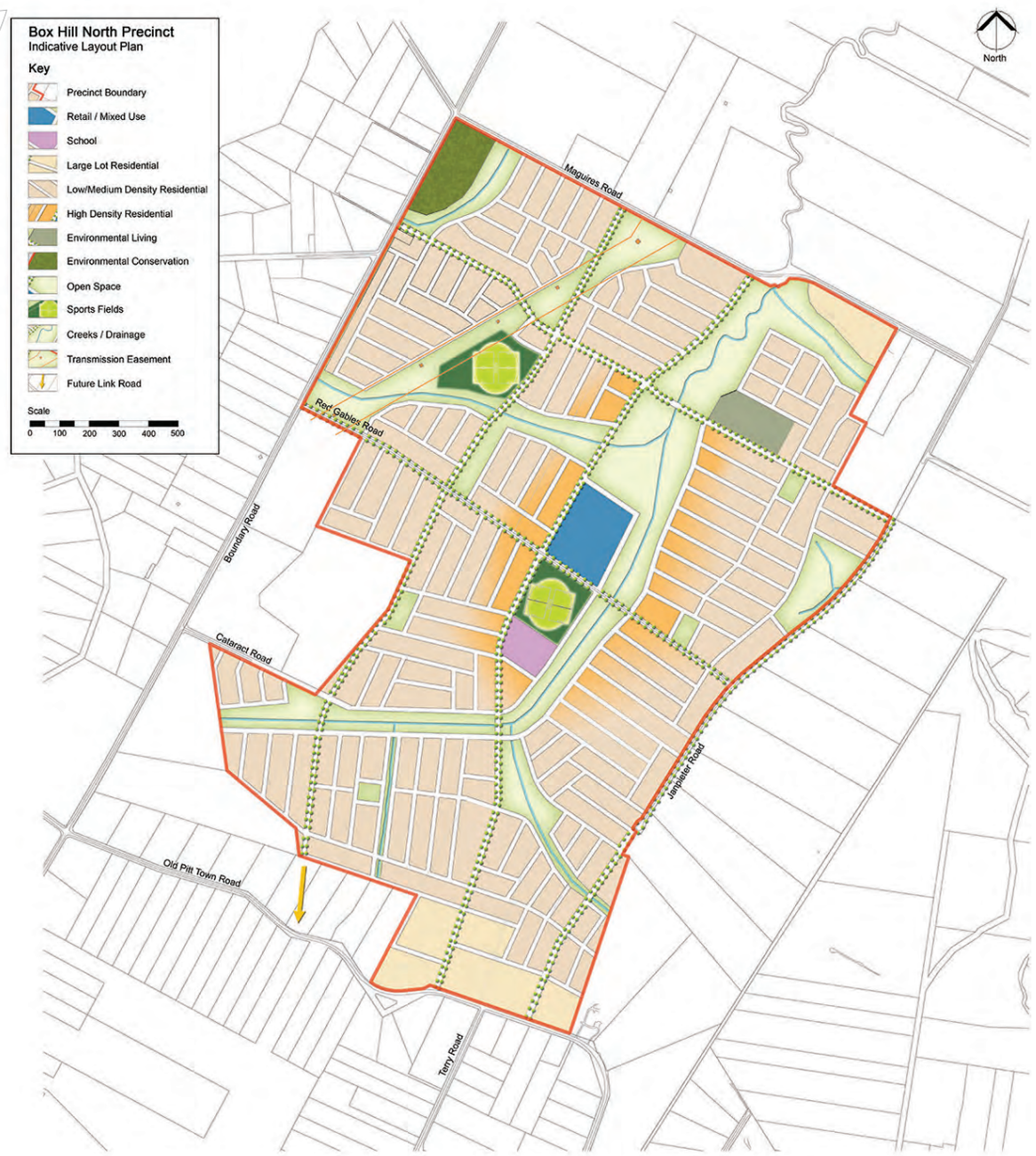


Figure 1. Indicative Layout Plan

The Planning Proposal is generally consistent with the provisions of all relevant local and State government strategic plans and strategies, including:

- Metropolitan Plan for Sydney 2036;
- Metropolitan Strategy - City of Cities: A Plan for Sydney's Future (2005);
- Metropolitan Transport Plan – Connecting the City of Cities (2010);
- Draft North West Subregional Strategy;
- North West Sector Bus Servicing Plan;
- State Environmental Planning Policies;
- Section 117 Directions; and
- Draft Local Strategy – New Strategic Direction for Baulkham Hills Shire.

Environmental Impact

Detailed investigations of site constraints demonstrate that the land is relatively free of major physical constraints. The Planning Proposal presents a holistic and integrated outcome for Box Hill North having regard to biodiversity, water, Aboriginal archaeology and other environmental features. The planning proposal demonstrates that the proposed development is satisfactory with respect to:

- transport and traffic;
- biodiversity values;
- servicing of water, waste water and power;
- flood impact, stormwater management and water quality;
- indigenous heritage;
- bushfire risk; and
- social infrastructure.

The suitability and capacity of the site for the proposed range and intensity of uses taking into account the site's regional context and environmental, economic and social opportunities and constraints has been addressed and the redevelopment of Box Hill North will result in significant benefits for North-West Sydney and its future residents.

SECTION 1.

Introduction

1. Introduction

1.1. Purpose of the Planning Proposal

This Planning Proposal is submitted to The Hills Shire Council (Council) in support of an amendment to The Hills Local Environmental Plan (LEP) 2012. The proposal is to rezone a 380 hectare parcel of land at Box Hill North to accommodate a new residential community comprising 4,100 dwellings, a 5.5 hectare town centre, active and passive open space, a school site, new roads and infrastructure. The proposal is a logical extension of the recently rezoned Box Hill and Box Hill Industrial Precincts to the immediate south of the site.

The proponent of this proposal is E.J. Cooper and Son Pty Ltd (EJC) who are wholly owned by the Baiada family group of companies. EJC represent thirty one (31) land holdings subject to the proposal, representing 86% of the site. EJC have entered into agreements with landowners to purchase their land.

The Planning Proposal is supported by an Indicative Layout Plan (ILP), which represents the overall planning framework and preferred outcome for Box Hill North. The ILP includes:

- approximately 290 hectares of residential land;
- a 5.5 hectare town centre incorporating a mix of retail, commercial and business uses capable of accommodating up to 10,000m2 of floor space;
- a 2.2 hectare new school site;
- new roads and infrastructure;
- sporting fields and parks;
- an integrated passive recreation area within a riparian corridor network; and
- land for environmental conservation.

The planning proposal includes a servicing and water management and remediation strategy for the site. It is also accompanied by an offer to enter into a Voluntary Planning Agreement with State Government and Council for the delivery of infrastructure, services and utilities that are required to meet the future demands of Box Hill North. This includes road network improvements, land for a primary school, district and local open space and a multi-purpose community centre.

The strategic justification for the rezoning of Box Hill North has been demonstrated by the identification of Box Hill North as a 'strategic investigation site' as part of the Department of Planning and Infrastructure's Potential Home Sites Program in March 2013, being seen as a 'strategic fit' in terms of planned growth and urban policy. Whilst the site was seen as a 'strategic fit', lack of enabling services and long lead in times and fragmented ownership posed a challenge for delivery. This has now been remedied with agreements to purchase 86% of the site and 'in principal' support with Sydney Water in relation to forward funding enabling services.

There are sound planning reasons to support the rezoning of Box Hill North at this time when investment certainty, housing affordability and land supply are key issues of concern at the national, state and regional level. Australia faces a national housing affordability and supply crisis. As at the end of 2010, the National Supply Council's estimated there to be a short fall of approximately 200,000 homes in NSW. This number was expected to grow in the short to

medium term. Recent pronouncements by all levels of Government agree that the contributing causes of the housing affordability crisis are inadequate housing supply in the market, complex planning systems and high infrastructure levies. Housing affordability is a key issue for North West Sydney and The Hills Shire. Whilst Council acknowledges that local government options are limited, it does recognise that adequate housing supply, diversity of choice, a mix of dwelling sizes including smaller lot housing and a sufficient supply of adaptable and accessible housing can partly address this issue at the local level. The successful development of Box Hill North will assist in meeting State government policy to release as much land to the market as quickly as possible. The project is consistent with and will assist in the delivery of key outcomes of the NSW State Plan and the North West Sub-Regional Strategy by contributing to the supply to market of appropriately located land to sustainably accommodate the projected housing and employment needs of the region's population and The Hills Shire which is required to provide 21,500 dwellings by 2031.

The Planning Proposal will deliver a range of densities, lot sizes and dwelling types and create a diverse community that is demographically balanced. The variety of housing forms will provide opportunities to respond to changing life cycle, lifestyle and work requirements over time, enabling people to age in place.

This report has been prepared by APP Corporation Pty Ltd on behalf of EJC and is based on plans and information provided by Design IQ and other supporting technical documents (refer to Table of Contents). It has been prepared in accordance with the Department of Planning and Infrastructure's '*A guide to preparing planning proposals*' (October 2012) and includes the following:

- a statement of the objectives;
- an explanation of the provisions proposed;
- the justification for those objectives, outcomes and provisions and the process for their implementation;
- a zoning map which reflects the proposed land use zones; and
- acknowledges the community consultation that will be undertaken.

This section of the planning proposal addresses the matters that must be addressed as set out in section 55(2) of the *Environmental Planning and Assessment Act 1979* and the Department of Planning and Infrastructure's '*A guide to preparing planning proposals*' (October 2012).

1.2. Structure of this Report

The Planning Proposal is structured as follows:

Section 2	Site Analysis;
Section 3	Planning Proposal;
Section 4	Indicative Layout Plan;
Section 5	Proposed LEP Amendments;
Section 6	Development Contributions;
Section 7	Strategic Justification;
Section 8	Environmental, Social and Economic Impact
Section 9	Conclusion

1.3. Background

1.3.1. Potential Home Sites Program (Department of Planning and Infrastructure)

In August 2011, the Minster for Planning and Infrastructure called for expressions of interest from large landholders to develop their land for housing where it is close to infrastructure. By the end of November 2011 forty three (43) sites were nominated of different sizes and in a variety of locations for government consideration. On 27 January 2012, the CEO's Review Committee decided that twenty nine (29) sites located in the Sydney Region and over 100 hectares in size would be evaluated, including Box Hill North.

In March 2013, the NSW Government announced the outcomes of a review into potential housing opportunities. The evaluation assessed whether housing was appropriate on the land and could be delivered quickly by focussing on the broad questions of: the suitability of the site for urban development; infrastructure planning and cost (i.e. at no additional cost to government); the ability of nominees to deliver housing; and the appropriateness of the location.

Box Hill North was identified as a 'strategic investigation site', being seen as a 'strategic fit' in terms of planned growth and urban policy and potentially suitable for urban development (refer to Figure 2). The lack of enabling services and long lead in time and fragmented ownership posed a challenge for delivery of Box Hill North at the time of the review. These matters have now been remedied with EJC having entered into agreements to purchase 86% of the site and 'in principal' support with Sydney Water in relation to forward funding enabling services. As demonstrated throughout this planning proposal, the Box Hill North site is capable of speedy and well planned development with the first lots ready to be taken up in 2016.

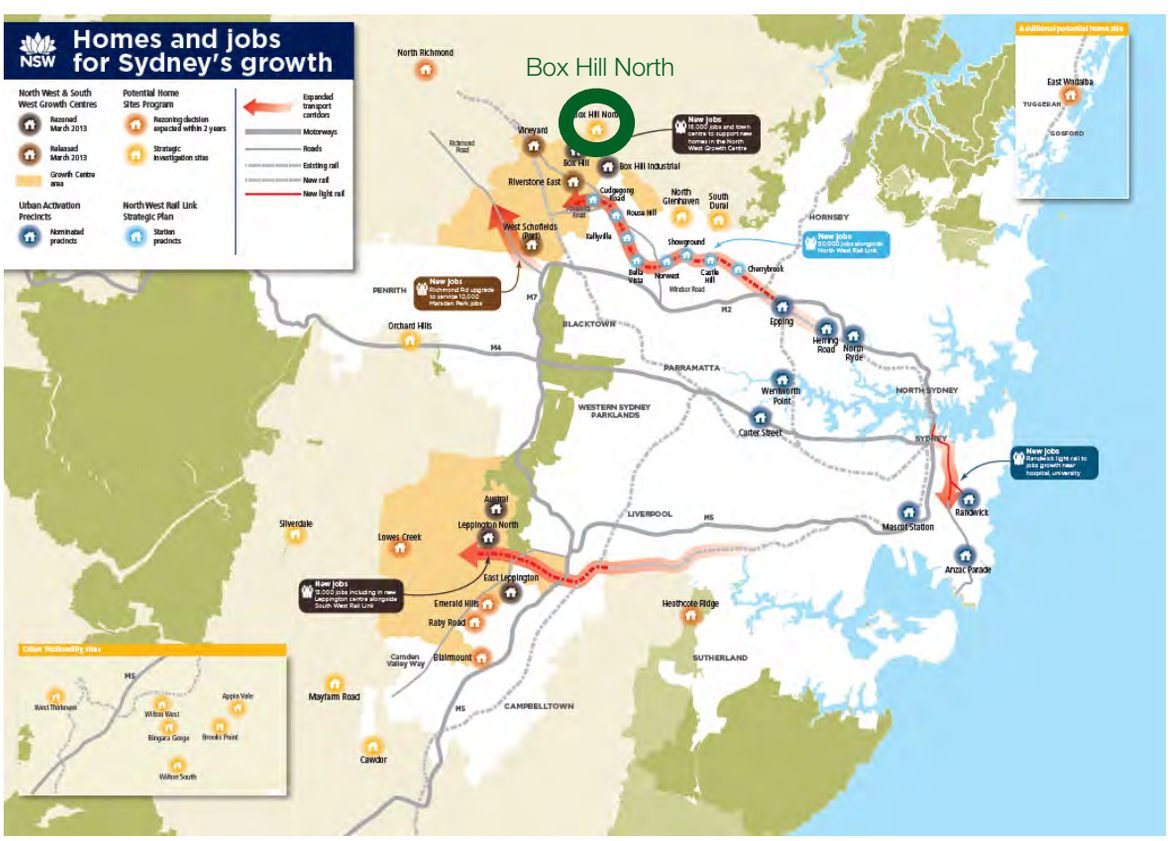


Figure 2. Potential Homes Sites Program – Evaluation Report

1.3.2. Consultation

Consultation has been undertaken with Council and relevant Government agencies during the preparation of supporting technical studies investigations. The following public authorities, including all relevant utility providers, have been consulted:

- Department of Planning and Infrastructure;
- Department of Environment and Heritage;
- Department of Education and Communities;
- Department of Transport;
- The Hills Shire Council
- Transport NSW (Roads and Maritime Services);
- NSW Rural Fire Service;
- Sydney Water;
- NSW Police; and
- NSW Fire.

A summary of consultation undertaken with public agencies has been prepared by APP and is included at **Appendix A**.

SECTION 2.

Site Analysis

2. Site Analysis

2.1. Site Location

Box Hill North comprises an area of approximately 380 hectares. It is located to the north of the recently rezoned Box Hill and Box Hill Industrial Precinct and lies approximately 48 km to the north west of Sydney CBD. The site is generally bound by Maguires Road to the north, Old Pitt Town Road to the south, Janpieter Road to the east and Boundary Road to the west. The metropolitan and regional context of the site is illustrated in Figure 3. A site plan is provided at Figure 4.

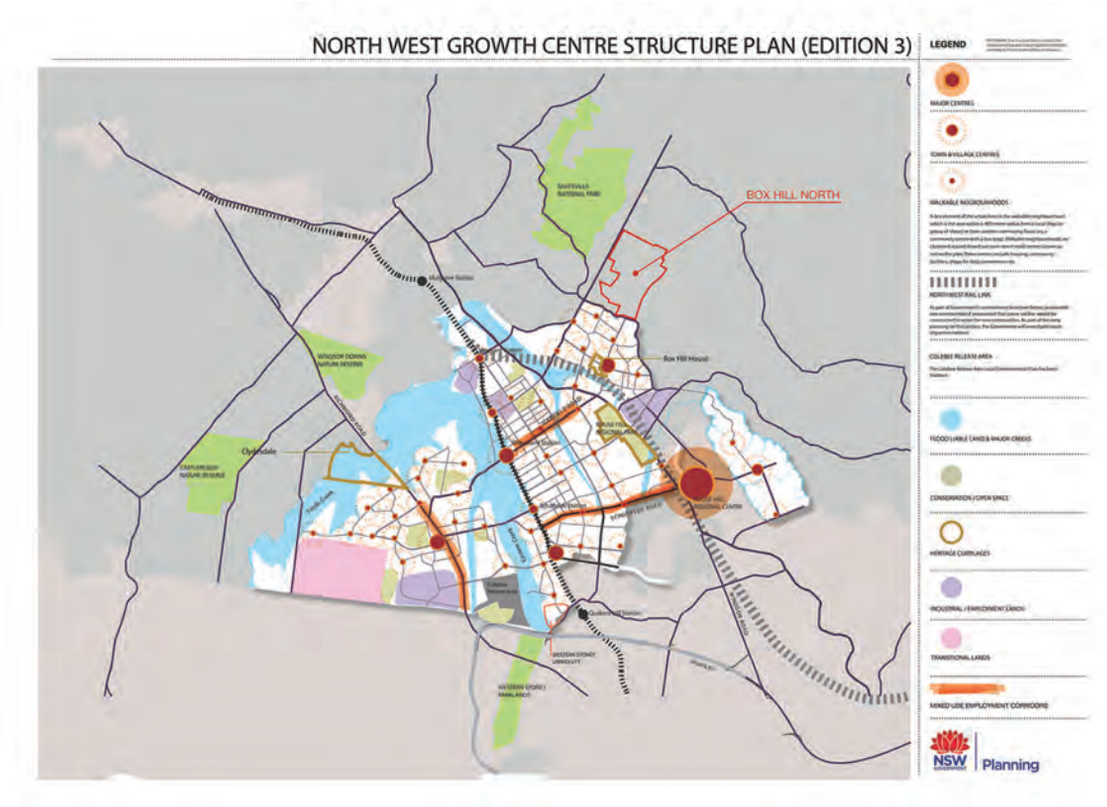


Figure 3. North West Growth Centre Structure Plan

Figure 4. Location Plan

2.2. Land Ownership and Legal Description

The legal description, area and current ownership of land to which the Planning Proposal applies is detailed in Table 1 below.

Table 1. Land ownership and legal description (land subject to agreement with EJC)

Lot	Lot and DP	Owner	Area (Ha)
9	593517	Brian & Susan Eveston	10.01
17	255616	John & Lorraine Earl	12.03
1	207750	Anthony & Angela Brisindi	11.09
2	11126	Mario Rechichi & Mary Lawler	12.07
10	593517	Joe & Stella Sant	10.01
4	253552	Eugene Kavanagh	10.02
27	255616	Michael & Jane Mathers	10.02
30	255616	Fred & Elaine Dominello	10.01
18	255616	Charlie & Mary Portelli	10.06
23	255616	Garry & Mary Galea	10.01
44	255616	Joseph & Steven Bugeja	10.01
43	255616	Zaren & Rose Bugeja	10.01
2	253552	D & A Kavanagh, T Akuila, R & R Edwards	10.35
4	135304 A & B	Paul & Margaret Gaudry	12.68
41	255616	Paul & Diane Sammut	10.01
1	11126	John & Daphne Cox	12.07
45	255616	E, M E G & A Miscallef	10.02
46	255616	E, M E G & A Miscallef	10.03
26	255616	Charlie & Pauline D'Anastasi	10.01
21	255616	Verna Joy Howes	11.02
5	658286	Twihaven Pty Limited	12.65
16	255616	John Martin Camilleri	10.56
31	255616	Diverse Construction Group Pty Limited	10.34
3	11126	Maguires Road Pty Limited	12.68
40	255616	Mahmoud & Jamila Hussein	10.01
29	255616	Norma Jean Pike	10.08
25	255616	Sam D'Anastasi	10.01
1	564211	John & Josephine Saliba	12.00
15	255616	I & M Zalac & G & C Galdes	10.03
22	255616	E.J. Cooper & Son PL	10.13
47	255616	E.J. Cooper & Son PL	10.15
			330.18

The legal description, area and current ownership of land also included in proposal which EJC do not have legal agreements to purchase are detailed in Table 2 below.

Table 2. Land ownership and legal description (land not subject to agreement with EJC)

Lot	Lot and DP	Owner	Area (Ha)
24	255616	Michael & John D'Anastasi	10.01
28	255616	Blazenka, Stephen & Christine Grgic	10.01
42	255616	John and Peta Cappello	10.01
1	253552	George & Vicki Attard	10.04
3	253552	MCA Medical Supplies Pty Limited	10.03
1	782360	Kevin James Wiley & Debra Ann Wiley	0.20
			50.3

The planning proposal and draft LEP maps show suggested land use zones and development standards for land that is identified in Table 2.

2.3. Existing Zoning and Development Standards

The site is currently zoned RU6 Transition under The Hills Local Environmental Plan 2012 (The Hills LEP 2012). There are a range of existing development standards that apply to the land under the existing LEP, including provisions relating to minimum subdivision lot size (i.e. 2 hectares) and building height (i.e. maximum 10 m).

2.4. Existing Land Uses and Development

An aerial photograph of the site is included at Figure 5. General views of the site are illustrated in Figures 6 to 11.

The site is used for low intensity farming, primarily grazing land for cattle, horse stables and a small number of market gardens. It also contains a number of rural residences, numerous farm dams and outbuildings. An 85 m wide electricity transmission corridor transects the north-west portion of the site.

2.5. Topography

The site consists of undulating land with slopes generally within a range of 1 to 3%. The land has generally been cleared and consists mainly of grassed land. The regional topographic data map (NATMAP, 1975) shows the site at approximately 40 metres Australian Height Datum (AHD). The southern portion of the site along Old Pitt Town Road forms a ridge with a gentle fall to the north. There are a number of small drainage lines that cross the site, connecting farm dams, with a main creek Cataract Creek orientated north south in the northern portion of the site. The site topography is illustrated at Figure 12.

Figure 5. Aerial Photograph

Figure 6. View of the site from Cataract Road, looking north-east

Figure 9. View of the site along Cataract Road, looking south-east

Figure 7. View of the site from Red Gables Road, looking north

Figure 10. View of the site along Maguires Road, looking south

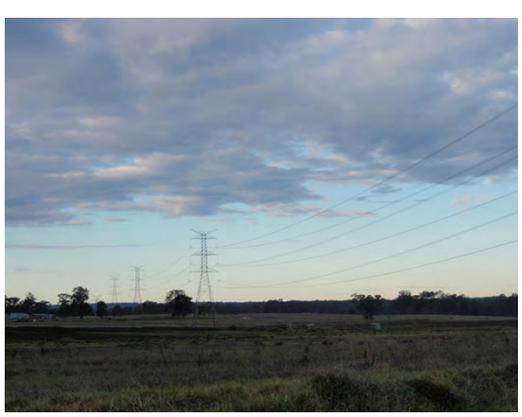


Figure 8. View of the site and transmission line and towers from the corner of Red Gables Road and Boundary Road

Figure 11. View from the north-east corner of the site (Maguires Road), looking south-west

Figure 12. Topography

2.6. Hydrology

Three water courses enter the site along the western boundary. Two of these water courses merge within the site with the third draining through the north-west corner of the site. The combined water course flows in a northerly direction and forms a tributary to Cataract Creek. Another water course enters the site at the eastern boundary, toward the northern extents. This water course joins the main water course at the site's northern boundary. A small portion of the site drains to the eastern boundary and forms a tributary to Cattai Creek.

The site includes a number of farm dams, associated diversion embankments and channels, both online and offline to the main water courses (refer to Figure 14). Several of these online dams are significant in area (up to approximately 15 hectares), resulting in a significant change to the hydrology and flooding that would have occurred prior to any development of the catchment.

2.6.1. Riparian Corridors

As part of the NSW Office of Water guidelines, water courses orders have been classified under the Strahler System using current 1:25,000 topographic maps. Water courses within the site have been classified as either 1st or 2nd order water courses (refer to Figure 15) and are subject to the riparian corridor widths and riparian corridor matrix set out in Table 3 and Figure 13.

Table 3. Strahler System of Stream Classification

Watercourse type	VRZ width (each side of watercourse)	Total RC width
1st order	10 m	20 m + channel width
2nd order	20 m	40 m + channel width
3rd order	30 m	60 m + channel width
4th order and greater (includes estuaries, wetlands and any parts of rivers influenced by tidal waters)	40 m	80 m + channel width

Stream order	Vegetated Riparian Zone (VRZ)	RC off-setting for non RC uses	Cycleways and paths	Detention basins		Stormwater outlet structures and essential services	Stream realignment	Road crossings		
				Only within 50% outer VRZ	Online			Any	Culvert	Bridge
1st	10m	•	•	•	•	•	•	•		
2nd	20m	•	•	•	•	•		•		
3rd	30m	•	•	•		•			•	•
4th +	40m	•	•	•		•			•	•

Figure 13. Riparian Corridor Matrix (NSW Office of Water)

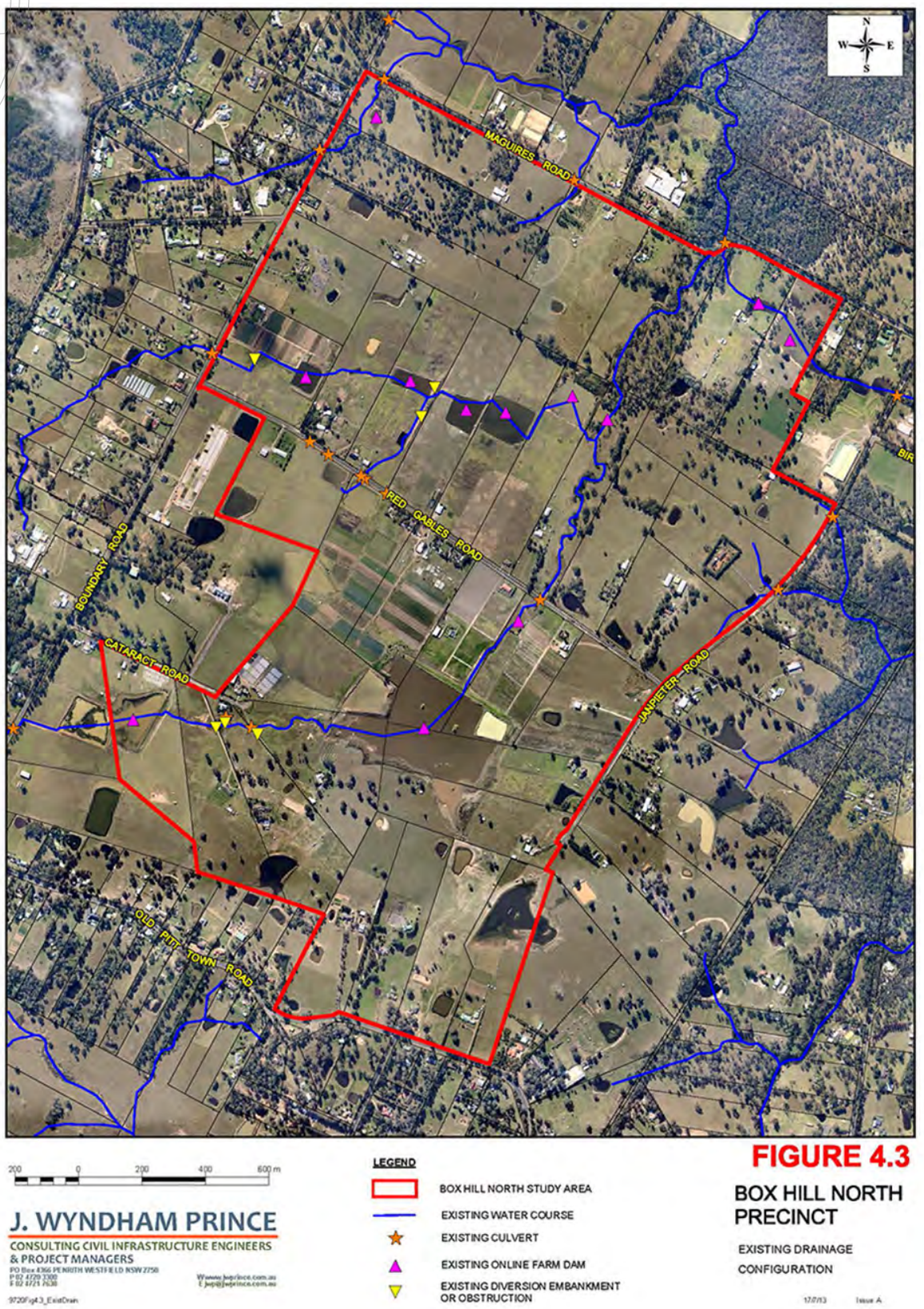


Figure 14. Existing drainage configuration

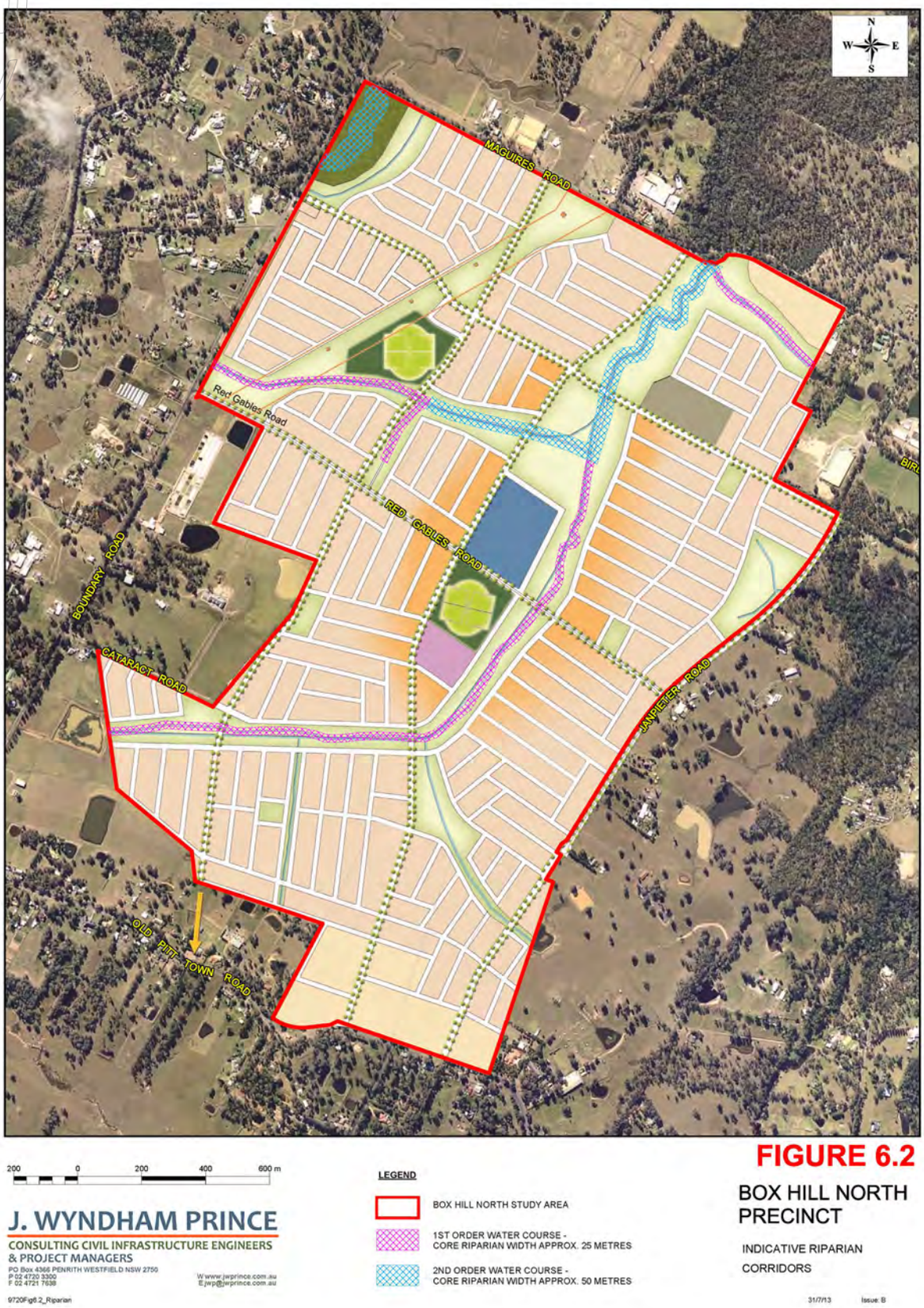


Figure 15. Indicative Riparian Corridor

2.6.2. Flooding

The Floodplain within the Box Hill North site is located above RL 17.3 and is therefore not affected by regional Hawkesbury/Nepean flooding for the 100 year ARI event. The regional PMF extends slightly into the northern extents of the Box Hill North Precinct, but is limited to the area designated as riparian corridor. As the chances of a regional and local PMF storm event occurring simultaneously are extremely remote, regional tailwater conditions are therefore not considered for the site. The extent of the 100 year ARI and PMF regional flood events is illustrated on Figure 16.

2.7. Geology

The regional geological map (DMR, 1991) shows the site is underlain by Middle Triassic Bringelly Shale, Mittagong Formation and Ashfield Shale, all part of the Wianamatta Group. The Bringelly Shale consists of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff. The Mittagong Formation consists of fine to medium-grained quartz-lithic sandstone. The Ashfield Shale consists of dark-grey to black claystone-siltstone and fine sandstone-siltstone laminate.

The regional soil map (SCS, 1989) shows the site located within two soil landscape groups, the residual Lucas Heights and Blacktown Soil Landscapes. The Lucas Heights Landscape soils are typically found on gently undulating crests and ridged on plateau surfaces of the Mittagong Formation, with local reliefs of up to 30 m and shallow slopes. The soils generally consist of moderately deep hard setting yellow podzolic and yellow soloth soils. The profile is characterised by stony soil, low soil fertility and low available water capacity. The Blacktown Soil Landscape soils are typically found on gently undulating rises overlying shales of the Wianamatta Group, with local reliefs of up to 30 m and shallow slopes. The soils generally consist of shallow to moderately deep hard setting podzolic soils, typically mottled red and brown on crests and grading to yellow on lower slopes and within drainage lines. The profile is characterised by moderately reactive highly plastic subsoils, low soil fertility and poor soil drainage. The original vegetation of eucalypt woodland and tall open forest is expected to have been cleared.

Groundwater bore data indicates relatively shallow surface soils comprising sandy clay and sand to depths between 0.5 m and 13 m below ground surface overlying sandstone and shale bedrock.

2.8. Acid sulphate soil

Acid Sulphate Soil mapping under The Hills LEP 2012 does not indicate the presence of acid sulphate soils.

2.9. Contamination

A Preliminary Site Investigation of the site was undertaken by JBS Environmental Pty Ltd (refer to report included at Appendix B). The preliminary site investigation has concluded that the potential for widespread contamination across the site is low and the potential areas of 'environmental concern' as identified below will not prevent planning and development of the land for the proposed uses.

2.9.1. Potential areas of environmental concern

Potential areas of environmental concern are identified in Figure 17 and Table 4.

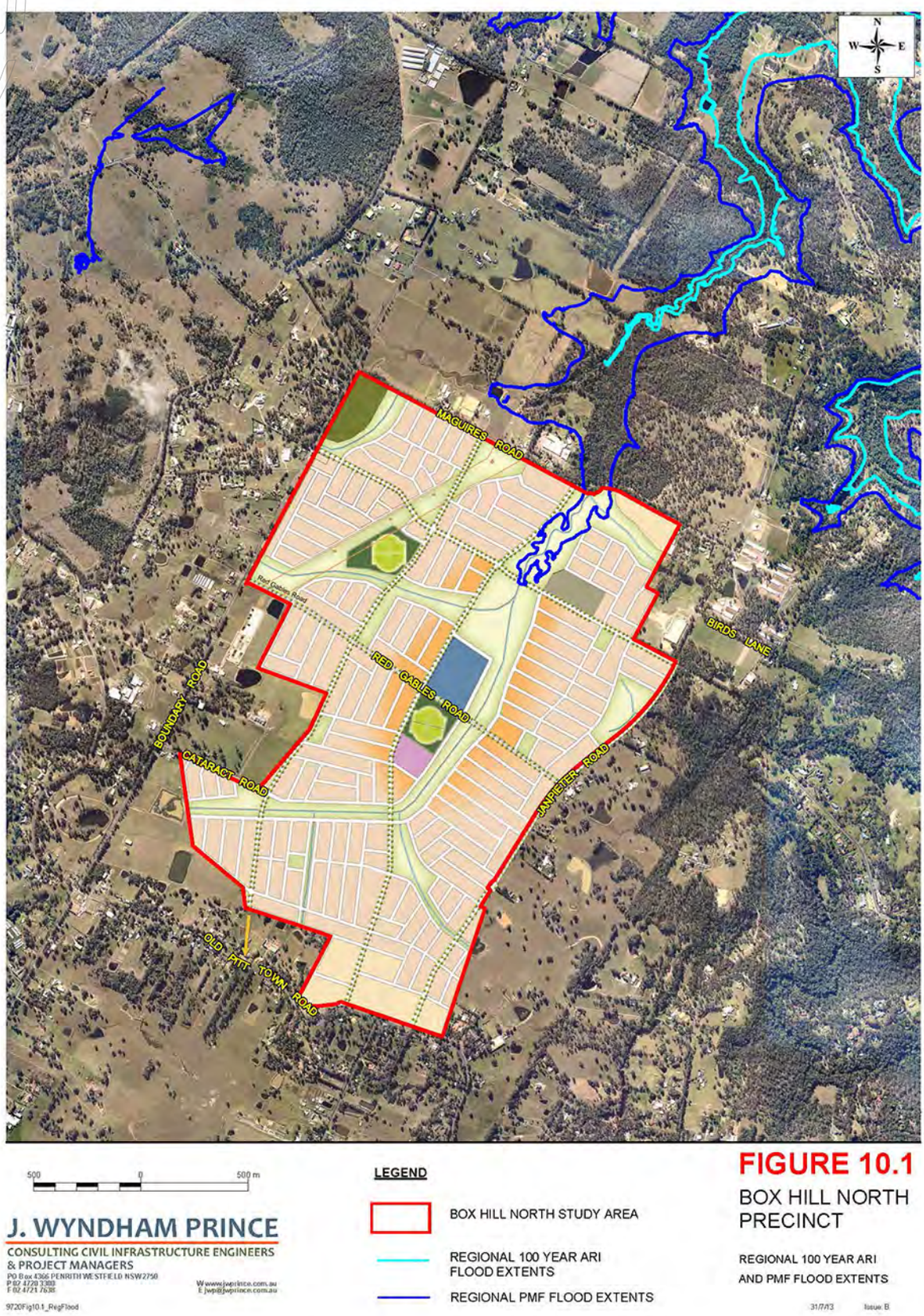


Figure 16. Regional 100 Year ARI and PMF Flood Extents

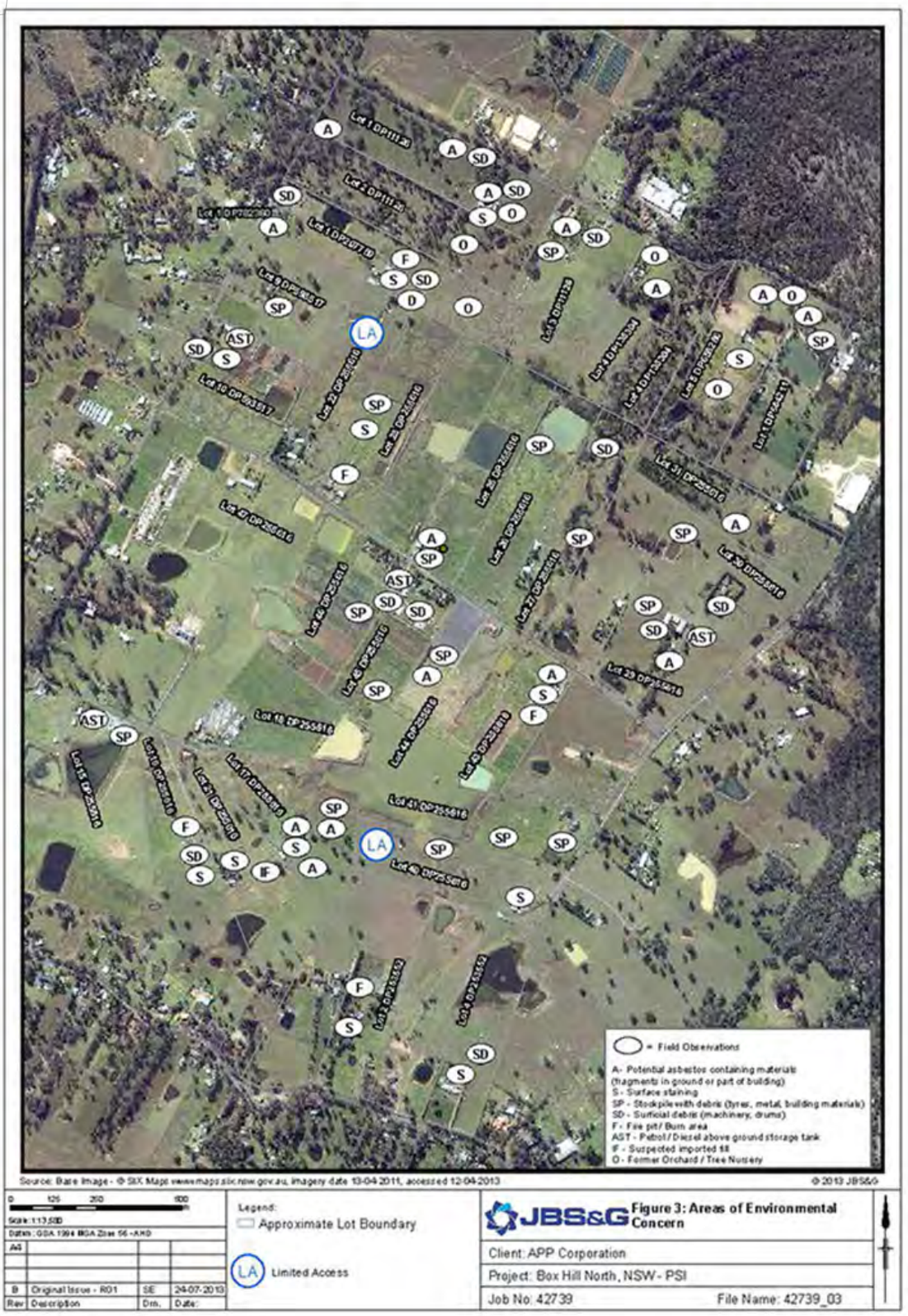


Figure 17. Areas of environmental concern

Table 4. Potential areas of environmental concern

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
Fill material used to alter the sites topography	Heavy metals, TPH/BTEX, PAHs, OCPs, PCBs, volatile organic compounds (VOCs), asbestos, acid sulphate soils (ASS)
Former site structures	Lead paint, asbestos
Contamination associated with agricultural landuse, including former orchards and/or tree nurseries	Heavy metals, OCPs and OPPs
Potential underground and/or above ground storage tanks at the site (in particular at farm workshops)	Heavy metals, TPH/BTEX, PAHs and VOCs
Hazardous materials storage (pesticides), maintenance areas/workshops with associated oil storage/staining, surface debris/ debris stockpiles and burn pits.	Heavy metals, TPH/BTEX, PAHs, OCPs, PCBs, VOCs, asbestos
Regional groundwater (regional use predominantly agricultural)	OCPs, OPPs, metals, TPH/BTEX, VOCs, nutrients.

2.9.2. Potentially Contaminated Media

Potentially contaminated media present at the site include:

- Fill material;
- Natural soils and/or bedrock; and
- Groundwater.

The historical review identified that previous site activities has included agricultural activities which may have impacted the historical soils. In addition, the reclamation and filling of around farm dams has the potential for impacted material to have been imported to the site for use as fill. Based on the potential mobility of contaminants and their associated potential leachability through the soil/fill profile, vertical migration of contaminants from the surface soils and fill material into the underlying natural soils/sandstone bedrock may have occurred. As a result, the natural soils and underlying sandstone bedrock are also considered to be potentially contaminated media. Given the occurrence of alluvial soil conditions at the site, there is a possibility of shallow perched groundwater occurring within either alluvial deposits or occurring across the bedrock interface in near surface soils, particularly following sustained rainfall events. The anticipated shallow depth to underlying sandstone bedrock of low permeability may result in the potential for lateral migration of contaminants within subsoil water across the bedrock interface in surface and near-surface fill material and/or natural soil especially following rainfall events Taking into account the likely depth of groundwater and the potential leachability of the identified contaminants of concern, it is considered that groundwater is a potentially contaminated medium. As with the natural soils, the potential for contamination of groundwater will depend upon the actual nature, occurrence and characteristics of contamination within the overlying fill material and potentially natural soils.

2.9.3. Potential for Migration

Contaminants generally migrate from site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential contaminants identified as part of the site history review and site inspection are generally in either a solid form (e.g. heavy metals, PAHs, asbestos, OCPs) or liquid form (e.g. fuel, oils, pesticides). As the ground surface across the site comprises predominantly unsealed areas, the potential for windblown dust from the site and potential for contamination migration via surface water movement and infiltration of water and subsequent migration through the soil profile is considered to be moderate.

Based on the results of the PSI investigation as outlined in section 8.5, there is potential for subsurface contamination to be present on the site as a result of current and previous site usage (i.e. agriculture). Based on the site observations and agriculturally related site activities, it is considered that the potential for widespread contamination across the site is low, with the possible exception of asbestos.

The impact of contamination on the planning proposal is addressed in section 3.4.

2.10. Aboriginal Cultural Heritage

An Aboriginal Heritage Archaeological Assessment Report, prepared by Kelleher Nightingale Consulting Pty Ltd is included at **Appendix C**. The assessment included background research and an archaeological field survey conducted in accordance with the Office of Environment and Heritage (OEH) requirements including:

- Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales; and
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.

Four Aboriginal archaeological sites were identified in the study area:

- Box Hill North 1 (BHN 1) – grinding groove site;
- Box Hill North 2 (BHN 2) – open artefact scatter ;
- Box Hill North 3 (BHN 3) - open artefact scatter; and
- Box Hill North 4 (BHN 4) – isolated find.

These sites are identified on Figure 18. Three of the identified sites (i.e. BHN 1, BHN 2 and BHN 3) were defined by an association with the flat terraces and gentle lower slopes bordering waterways, characteristic of the topography of the study area. The presence of a grinding groove site on the Hawkesbury sandstone outcropping in the north of the study area is characteristic of the underlying geology of this part of the study area.

Areas of high potential for intact subsurface archaeology exist in association with the particular landforms known to be archaeologically sensitive in the local and regional area – gentle lower slopes, terraces and flats bordering waterways (refer to Figure 19). These areas, where the deposit is stable and relatively unmodified by disturbance, retain high archaeological potential. Moderate potential exists on less archaeologically sensitive landforms, or where the ground surface has been subject to low-moderate disturbance. Low archaeological potential is contained in areas that have been subject to significant disturbance and the creation of highly modified landscapes due to intensive farming and dam construction.

Low visibility of the ground surface hampered the identification of archaeological sites and it is possible that the area contains more than were identified during the field survey.

In accordance with the significance assessment criteria established in the Australia ICOMOS Burra Charter, 1999 (Australia ICOMOS 1999), BHN 1 (the grinding groove site) is considered to be of high significance. The remaining Aboriginal archaeological sites, BHN 2 and BHN 3 (open artefact scatter) and BHN 4 (isolated find) have moderate significance.

Figure 18. Aboriginal sites within the site

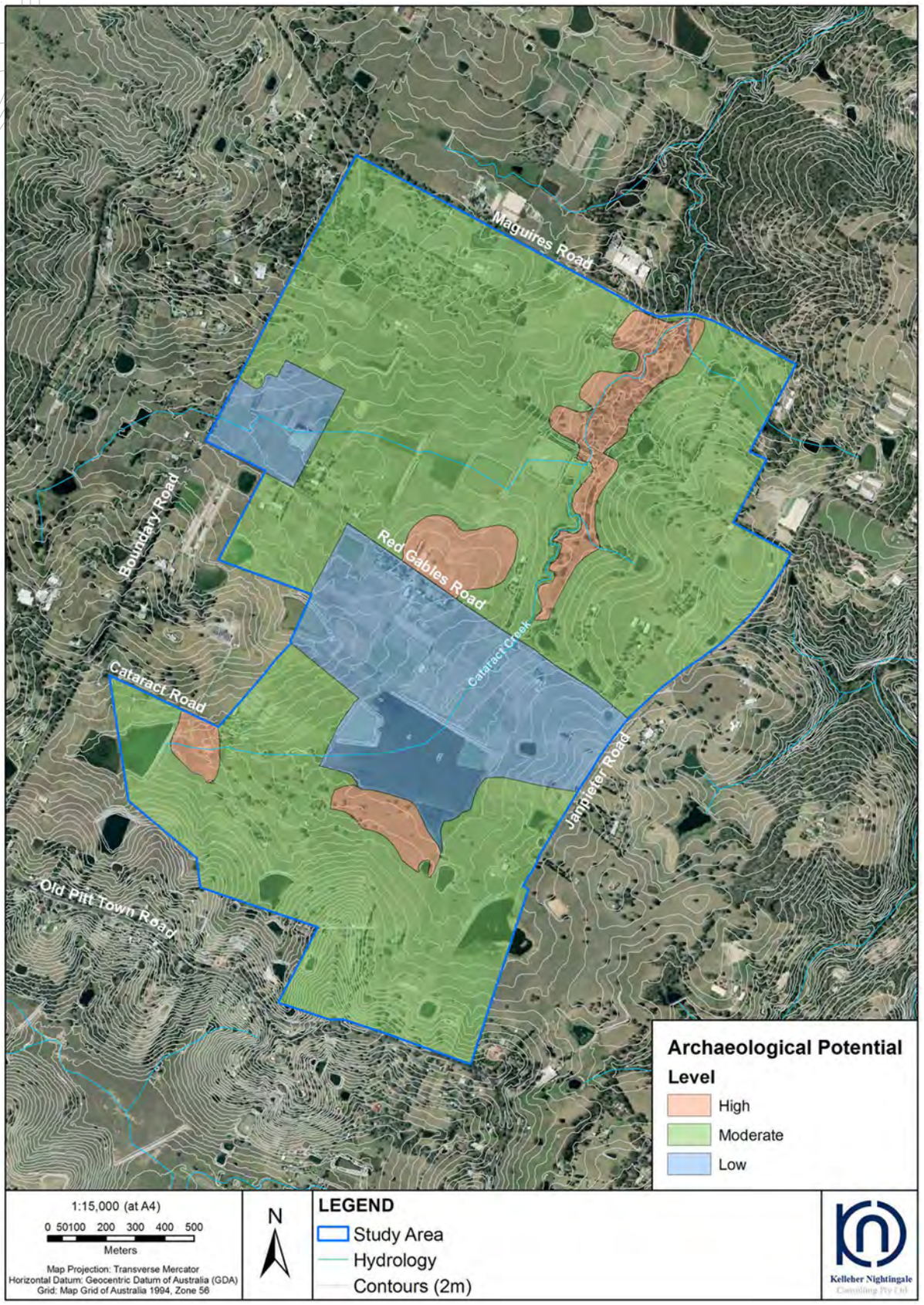


Figure 19. Assessment of archaeological potential in the study area

2.11. European Heritage

The site does not contain any items of local or State heritage significance.

2.12. Ecological Characteristics and Values

A Flora and Fauna Assessment prepared by NGH Environmental and Cumberland Ecology is included at **Appendix F**. The key ecological characteristics and values of the site are identified below.

2.12.1. Vegetation communities

The subject site has a history of agricultural land use and has been largely cleared as a result. The site consists of farmland with exotic vegetation (pasture, crops and shelter belts of trees) and farm dams.

The original vegetation across most of the subject site was likely to have comprised open forest and woodland. In cleared areas, the presence of scattered paddock trees species such as Grey Box (*Eucalyptus moluccana*), Forest Red Gum (*Eucalyptus tereticornis*) and Narrow-leaved Ironbark (*Eucalyptus crebra*) indicate that the original vegetation across much of the subject site would have been dominated by Cumberland Plain Woodland (CPW). In the north east of the subject site, open forest dominated by Forest Red Gum (*Eucalyptus tereticornis*), Rough Barked Apple (*Angophora floribunda*) and Grey Gum (*Eucalyptus punctata*) together with a shrubbier understorey indicates that Shale Sandstone Transition Forest (SSTF) originally occurred along Cataract Creek, particularly in areas where Hawkesbury Sandstone is exposed at the creek banks.

Only a few patches of native woodland and forest vegetation remain in the current landscape (refer to Figure 20). These patches of woodland represent young, woodland and forest that have been allowed to regenerate after clearing. Notwithstanding, these vegetation patches conform to CPW and SSTF (Patches 1-3). The largest patches of CPW (Patches 4 and 5) and SSTF (Patch 6) are located within the northern portion of the site.

The size and shape of the remaining woodland areas, and the fact that they are surrounded by heavily cleared and modified farmland presents a challenge for long term conservation. This is because with increased intensity of land usage, there is potential for the remaining patches to become increasingly isolated and for edge effects (e.g. encroachment of weeds, disturbance by humans) to become more significant.

Cumberland Plain Woodland (Patches 1-5)

All of the mapped patches of CPW within the subject site support young canopy trees that are sufficiently mature to be reproductive. These trees are likely to produce blossom resources for fauna; however, they are too young to have hollows. All patches largely lack a shrubby understorey but have a moderate diversity of grasses and other native herbaceous plants in the understorey. Patch 1 is dominated largely by Forest Red Gum (*Eucalyptus tereticornis*). The understorey is semi-natural with a mixture of native grasses and shrubs such as Blackthorn (*Bursaria spinosa*).

Patches 2 and 3 are similar to Patch 1 in composition and diversity of understorey but are largely dominated by Grey Box (*Eucalyptus moluccana*) and Narrow-leaved Ironbark (*Eucalyptus crebra*). The grassy understorey within these patches is of variable quality but largely native in composition. Patches 4 and 5 were originally shown in the NGH assessment as one patch of CPW. However, due to the variable condition of the understorey, the original patch was refined to exclude exotic grassland areas from the patch. The better areas of CPW within Patch 4 are generally located within the western half of the patch (see Figure 21).

FIGURE 1 - Cumberland Plain Woodland and Shale Sandstone Transition Forest on the Subject Site

Figure 20. Location of CPW and SSTF

FIGURE 2 - Condition of Cumberland Plain Woodland and Shale Sandstone Transition Forest on the Subject Site

Figure 21. Condition of CPW and SSTF

Shale Sandstone Transition Forest (Patch 6)

SSTF occurs in the north east around the tributary of Cataract Creek. The patch is in an "L" shape, where the longest part of the patch is along the creek, with a bulge to the east. The trees along the creek appear to be the oldest and largest and the highest concentration of hollows is along the creek. Conversely, where the patch bulges away from the creek, the forest appears to be much younger re-growth and lacks tree hollows. Therefore the more significant portions of the SSTF patch on the subject site appear to be centred around the creek line. The trees within this patch are dominated largely by Forest Red Gum (*Eucalyptus tereticornis*) and Rough-barked Apple (*Angophora floribunda*). Other tree species include Grey Gum (*Eucalyptus punctata*) and Narrow-leaved Ironbark (*Eucalyptus crebra*).

Grassland

Native grasses are relatively abundant in the grassy openings amid Patch 4 and around Patch 1. Such native grasses and a suite of native herbs also occur amid the ground stratum of the six woodland patches on the subject site. Most grassland surrounding the patches of forest and woodland have been significantly altered and are now dominated by exotic grasses such as Carpet Grass (*Axonopus affinis*), Paspalum (*Paspalum dilatatum*) and Couch (*Cynodon dactylon*). Exotic grasslands comprise more than 90% of the grasslands within the site. Very little grassland on site appears to be of high enough condition to be considered as part of the state listing of the CPW TEC.

2.12.2. Fauna Habitats and Threatened Species

Threatened fauna with the potential to occur on the site is identified in Table 5 below.

Table 5. Threatened Fauna with Potential to Occur on the Subject Site

Threatened and Migratory Vertebrate Taxa	Latin Names	Status^ TSC Act	EPBC Act	*types of habitat resources	Vegetation Type
Birds					
Swift Parrot	*Lathamus discolor*	E	E	f	CPW, SSTF
Spotted Harrier	*Circus assimilis*	V	not listed	f	CPW, SSTF, dams
White-bellied Sea-eagle	*Haliaeetus leucogaster*	not listed	Mar; Mi	f	CPW, SSTF, dams, grassland
Cattle Egret	*Ardea ibis*	not listed	Mar; Mi	f	CPW, SSTF, dams, grassland
Tree-dwelling Marsupials					
Koala	*Phascolarctos cinereus*	V	V	f	CPW, SSTF
Microchiropteran Bats and Flying Foxes					
Grey-headed Flying Fox	*Pteropus poliocephalus*	V	V	f	CPW, SSTF
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	V	not listed	f	CPW, SSTF
Eastern Freetail-bat	*Mormopterus norfolkensis*	V	not listed	f, r	CPW, SSTF
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	not listed	f, r	CPW, SSTF

Threatened and Migratory Vertebrate Taxa	Latin Names	Status^ TSC Act	EPBC Act	*types of habitat resources	Vegetation Type
Frogs					
Green and Golden Bell Frog	*Litoria aurea*	E	V	f,b	dams
Invertebrates					
Cumberland Land Snail	*Meridolum corneovirens*	E	not listed	f,b	CPW, SSTF

^E = Endangered; V = Vulnerable; Mar = Marine; Mi = Migratory *f = foraging; r = roosting; b = breeding

The following threatened and migratory species were recorded during surveys in May 2013 by NGH Environmental:

- Spotted Harrier (*Circus assimilis*) – Vulnerable, TSC Act;
- Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*) - Vulnerable, TSC Act;
- Eastern Freetail-bat (*Mormopterus norfolkensis*) - Vulnerable, TSC Act;
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) - Vulnerable, TSC Act;
- White-bellied Sea-eagle (*Haliaeetus leucogaster*) – Migratory, EPBC Act; and
- Cattle Egret (*Ardea ibis*) – Migratory, EPBC Act.

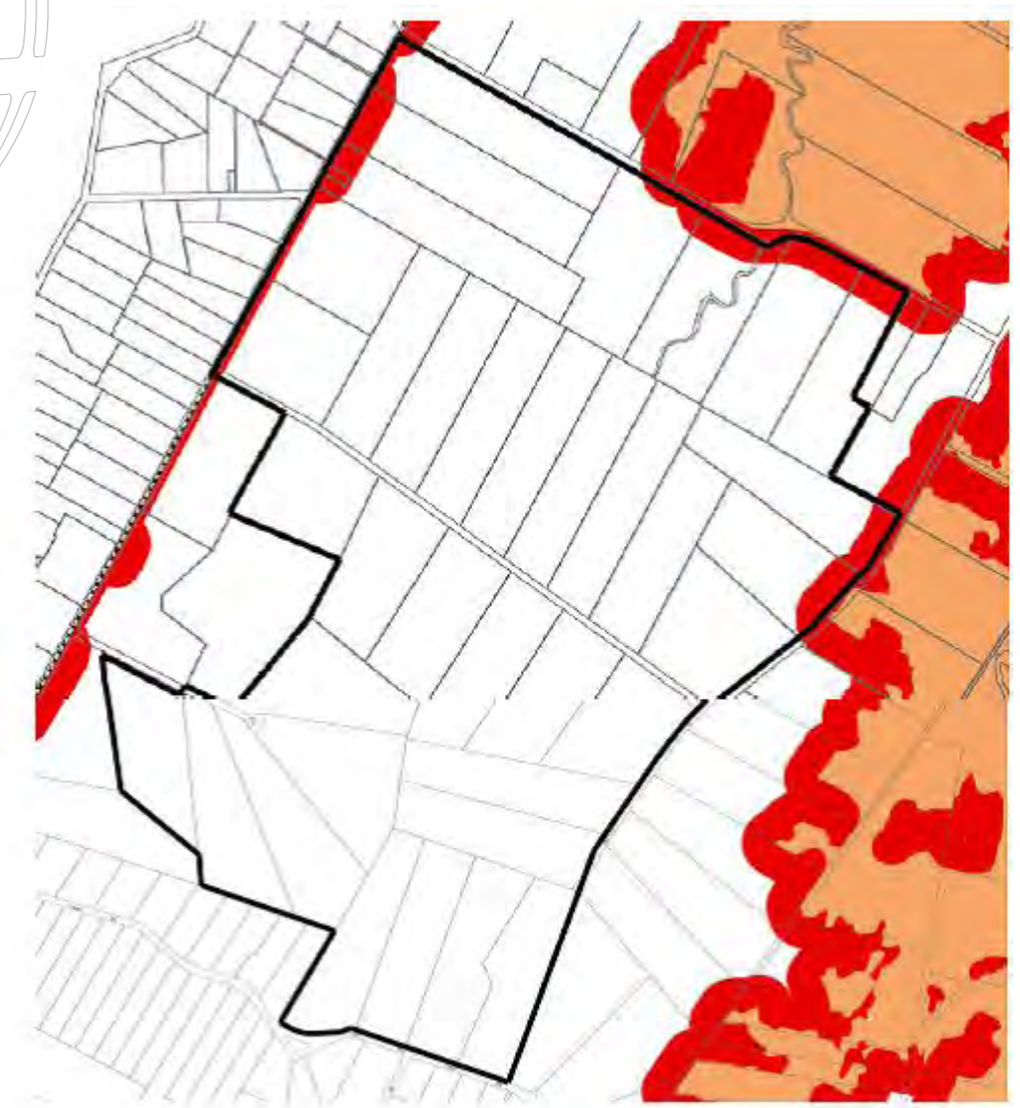
Forest and woodland habitats on the site are highly modified and generally, there is a lack of fallen timber on the ground to provide habitat that supports ground dwelling fauna. Patches of CPW (1-5) generally lack tree hollows as the dominant trees are relatively young mature specimens too young to produce hollows. All CPW woodland patches have semi-natural grassy understorey which, at the time of this investigation were cattle-grazed. Like the lack of fallen timber, this reduces the values of the CPW patches for fauna. Of the fauna species considered most likely to occur on the subject site, relatively few of these are likely to forage in or find significant habitat within the CPW patches. The SSTF on the site comprises the most intact and continuous wooded habitats for native fauna and, as it occurs along Cataract Creek, the larger trees occur in places amid sandstone outcrops. The SSTF on the subject site also retains the highest number of hollow-bearing trees and so have important habitat values for threatened fauna.

2.13. Bushfire Assessment

A bushfire constraints assessment, prepared by Australian Bushfire Protection Planners Pty Ltd is included at **Appendix E**. Parts of the site are identified as being within a 100 m buffer zone to Category 1 Bushfire Prone Vegetation on Council's Bushfire Prone Land Maps. These areas are shown on Figures 22 and 23 and comprise linear strips of land within the sites:

- western boundary, adjacent to Boundary Road;
- northern boundary, adjacent to Maguires Road; and
- eastern boundary, adjacent to Janpieter Road

A site inspection undertaken by Australian Bushfire Protection Planners Pty Ltd has identified that Council's Bushfire Prone Land Map inaccurately records the extent of bushfire prone vegetation to the north and north-east of the site. This land is under-scrubbed, managed and not deemed to be Category 1 Bushfire Vegetation. As a result, a reduced area of the northern and eastern boundaries of the site should be identified as being located within the 'buffer' zone.



Legend: Orange – Category 1 Bushfire Prone Vegetation; Red – 100m wide buffer zone to Category 1 Bushfire Prone Vegetation.

Figure 22. Extract from The Hills Bushfire Prone Land Map

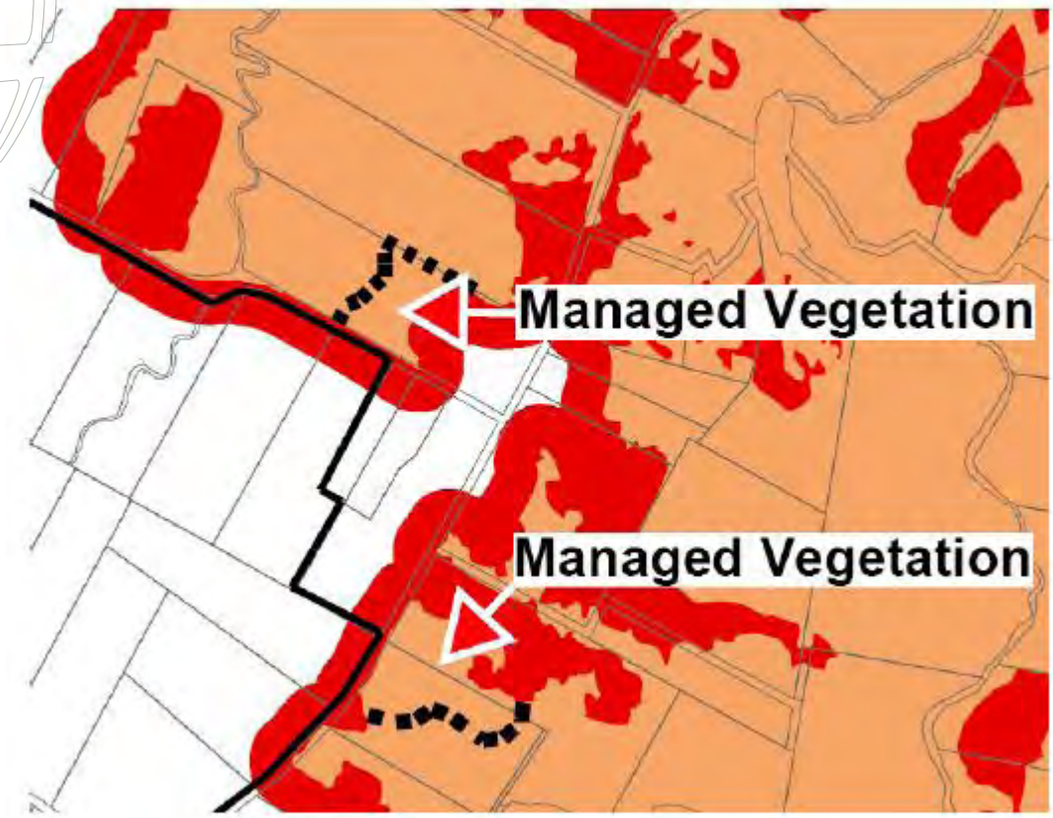


Figure 23. Extract from The Hills Bushfire Prone Land Map showing the modification to the extent of the mapped Category 1 Bushfire Vegetation (outside of the site)

2.14. Access and Transport

A Transport and Access Impact Assessment, prepared by GTA Consultants is included at **Appendix F.** The key transport network and future infrastructure and upgrades in the Greater Western Sydney region are identified in Figure 24.

2.14.1. North West Rail Link

The North West Rail Link will provide passenger rail services every 5 minutes during peak periods and every 10 minutes across the day and on weekends. The North West Rail Link will feature eight new stations between the Cudgegong Road Station in Schofields to Epping Station and extend the existing Epping to Chatswood line to Chatswood. Future plans for the line include extension to the Sydney CBD via a second Harbour Crossing and further extension to Hurstville and Bankstown.

2.14.2. Local Road Network

Key elements of the existing road network are:

- Windsor Road - state road, two-way road configured with a 4-lane, 26 metre wide carriageway, including a 8 metre wide median, set within an approximately 40 metre wide road reserve.
- Boundary Road - regional road, two-way road configured with a 2-lane, 8 metre wide carriageway, set within an approximately 20 metre wide road reserve.
- Old Pitt Town Road - local road, two-way road configured with a 2-lane, 8 metre wide carriageway, set within an approximately 20 metre wide road reserve.
- Terry Road - local road, two-way road configured with a 2-lane, 8 metre wide carriageway, set within an approximately 20 metre wide road reserve.

2.14.3. Road Network Improvements

As outlined in the North West Growth Centres Structure Plan - Explanatory Notes (Department of Planning and Infrastructure, March 2010), the *"structure Plan makes use of, and improves, the existing network of rural roads. The network will be extended and enhanced to accommodate the increase in travel demand. Existing arterials will be upgraded. These improved roads will also accommodate either bus priority measures, transit lanes or a centre median transitway".* Among the existing roads that have been identified for future upgrades over the next 25 to 30 years, and crucial for the connection of Box Hill North to the existing and proposed railway networks are Garfield Road corridor and Terry Road.

Intersection improvements planned as part of Box Hill and Box Hill Industrial Precincts include the following:

- Windsor Road/ Nelson Road – conversion to three-way intersection;
- Windsor Road/ Terry Road/ Garfield Road – additional right-turn lane along Windsor Road East, two lanes (one through, one right turn) along Terry Road and Garfield Road;
- Windsor Road/ Mount Carmel Road – new signalised; and
- Windsor Road/ Boundary Road – conversion to four-way with re-alignment of Loftus Street.

2.14.4. Bus Network

Busways operate Bus Route 746 along Terry Road and Old Pitt Town Road, with five trips daily between Riverstone and Box Hill. Hawkesbury Valley Buses operate Bus Route 662 along Boundary Road, with one service to Riverstone in the morning and one service from Riverstone in the afternoon on weekdays. In relation to future bus services, the North West Sector Bus Servicing Plan (NSW Transport and Infrastructure, 2009) provides for a future bus network that would service growing public transport demand in the North West Growth Centre arising from increased population and employment. The plan proposes an all-day bus network as shown in Figure 25.

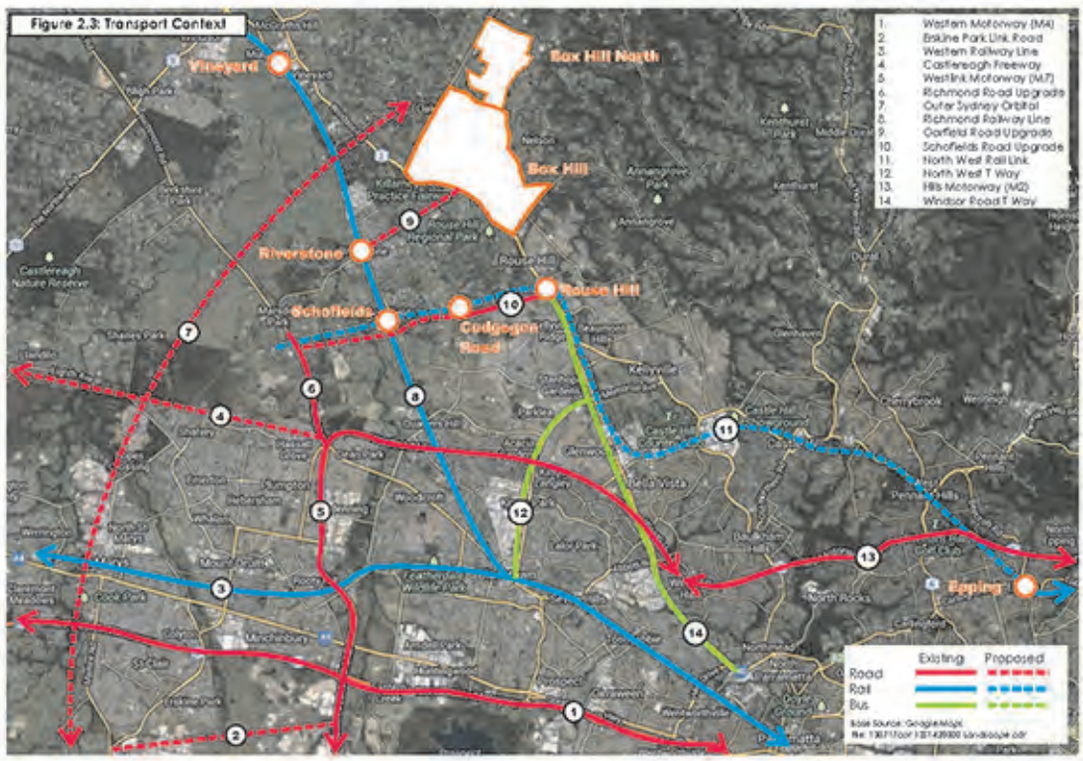


Figure 24. Regional Transport Context

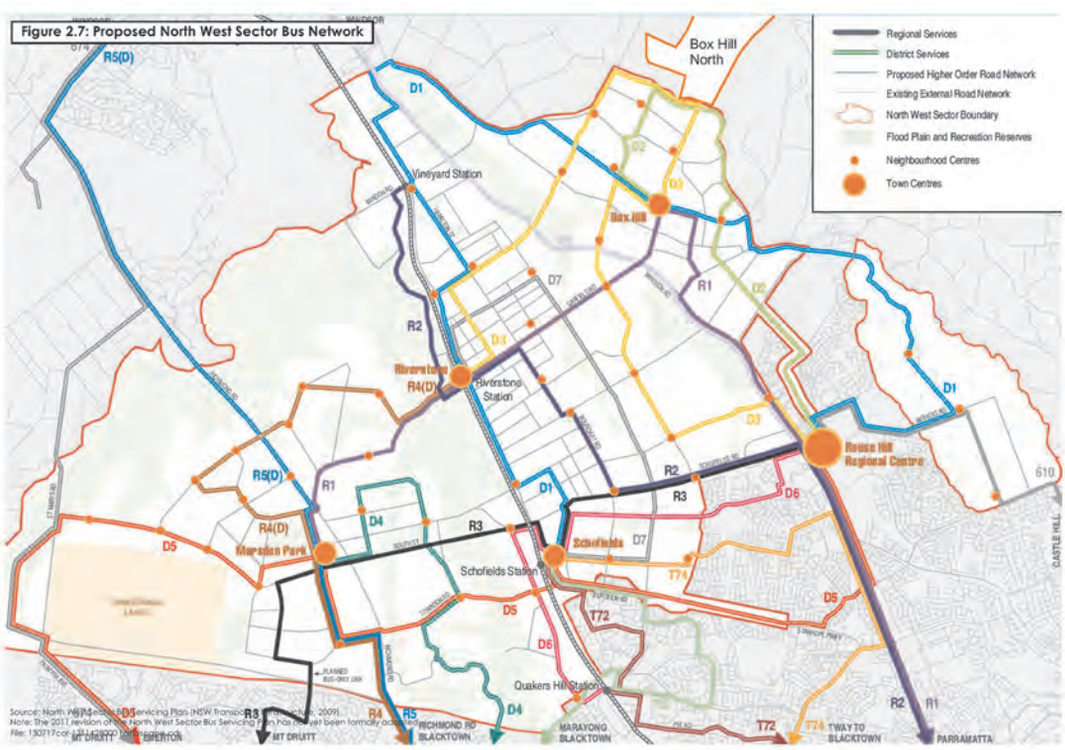


Figure 25. Proposed North West Sector Bus Network

The proposed bus network indicates two proposed new routes in the vicinity of Box Hill North:

- Route D2: Rouse Hill – Withers Road – Box Hill; and
- Route D3: Rouse Hill – Box Hill – Riverstone.

It is anticipated that the routes outlined in the 2009 North West Sector Bus Servicing Plan would be revised with the introduction of passenger rail services at Cudgegong Road station as part of the North West Rail Link.

2.15. Community and Social Infrastructure

Consistent with its current rural residential uses, there is no existing social infrastructure within Box Hill North. There is also little in the way of existing social infrastructure in the surrounding areas at present, although this will change shortly as development of the Box Hill and Box Hill Industrial Area Precincts gets underway.

Shopping centres

Rouse Hill Town Centre provides the major shopping centre for the district and also includes restaurants, cafes and a cinema. Local village shops are available in Maraylya and Oakville.

Schools

The closest government primary schools to the site are Maraylya Public School, Rouse Hill Public School, Oakville Public School and Vineyard Public School. All are located within 5km of the Box Hill North site. The closest government high school is Windsor High School, located approximately 6km west of the site. The closest Catholic schools are Marian College (Years 7-12), approximately 12km south east of the site and Our Lady of the Angels Catholic Primary school (k-6), approximately 6km to the south east. Rouse Hill Anglican College (k-12) is located approximately 7km south east of the site. In the wider Hills district there are a number of other private high schools within reach of the site including The Hills Grammar School (Kenthurst), Northolm Grammar (Arcadia) and William Clark College (Kellyville).

The majority of the primary schools identified above have increased enrolments between 2008 and 2012, reflecting recent population growth across the area. Of particular note is Oakville Public School, the closest school to Box Hill North. This school is already over its capacity with one demountable classroom and will have no capacity to absorb demand from Box Hill North.

The Box Hill North area falls within the catchment zone for Windsor High School, which has experienced fluctuating enrolments over recent years. With a capacity for 1100 students, and a current enrolment of only 520 students, it has significant spare capacity. The closest TAFE colleges are in Blacktown and Baulkham Hills.

Community Facilities

The Hills Shire Council provides two community halls within proximity to the site, the Box Hill Nelson Community Hall and the Maraylya Hall. Rouse Hill town centre contains the Vinegar Hill Memorial Library and Vinegar Hill Community Centre, which has a variety of learning spaces which include North West Community College and Learn2. The Vinegar Hill Community Centre has not been planned nor sized to accommodate demand from future Box Hill North residents.

Childcare facilities

There are a variety of child care facilities in proximity to Box Hill North including long day care, occasional day care, before and after school care, vacation care and pre-school care.

Welfare and support services

The area close to the development site contains two facilities offering services to residents with disabilities and their carers:

- McCall Gardens Disability provides accommodation and residential service to people with

intellectual disabilities, offering a range of personal support options and lifestyle choices to meet the individual and diverse needs of clients; and

- Care and Support Services Box Hill provides assistance to people who have a disability or people who are older and require additional support. For most other types of support services, residents rely on facilities and services based in Blacktown, Mount Druitt, Castle Hill and Windsor.

Medical services

The closest medical centres are located in the Rouse Hill town centre, and in Riverstone. The nearest hospital to the site is the Hawkesbury Hospital, approximately 8kmto the west. This is a private hospital, however is contracted to provide public patient services also. The area is also served by Blacktown and Westmead Hospitals as the major hospitals for the region, and by The Hills Private Hospital in Baulkham Hills and NorWest Private Hospital in Bella Vista.

Emergency Services

The closest ambulance station to the site is located within Riverstone. The nearest police stations are Riverstone Police Station and Hawkesbury Police Station. Annangrove Fire Station is located approximately 4km from the site, while the closest Rural Fire Service is the Box Hill - Nelson branch, located approximately 1km from the development site.

Open space and recreation facilities

There are currently no areas of public open space within Box Hill North or immediately adjacent areas that can meet the needs of the future Box Hill North residents. Within a 5km radius of the site there are a number of private and public sporting and recreation facilities that could be utilised by the future population. These include:

- Annangrove Aquatic and Leisure Centre, which provides a mix of pools, classes and water based activities;
- Maraylya Park, which contains a tennis court and a large playing oval;
- Killarney Practice Fairway Golf, which provides golf course facilities;
- Kingston Park Equestrian Centre; and
- Rouse Hill Regional Park, which is a large area of public open space with bike and walking trails, an adventure playground, barbecue facilities and extensive undercover seating facilities.

The Draft Contributions Plan No 15 for Box Hill Precinct notes that while “there is reasonable supply of open space in adjacent areas, overall there is a shortage of sports fields across the Shire and the Box Hill Precinct will not be able to rely on open space in the surrounding area” (p. 28).

New social infrastructure proposed for the area

New social infrastructure proposed for inclusion within the Box Hill and Box Hill Industrial Area Precincts is illustrated in Figure 26 below and includes new schools, child care facilities, open space, sport and recreation facilities, emergency services and cultural and community facilities.

While the needs of Box Hill North have not been factored into their planning, some of the proposed facilities may nevertheless help to meet needs generated from Box Hill North. This applies especially those provided on a commercial basis, where the additional population from Box Hill North will help to make viable a variety of shops, services and entertainment facilities.

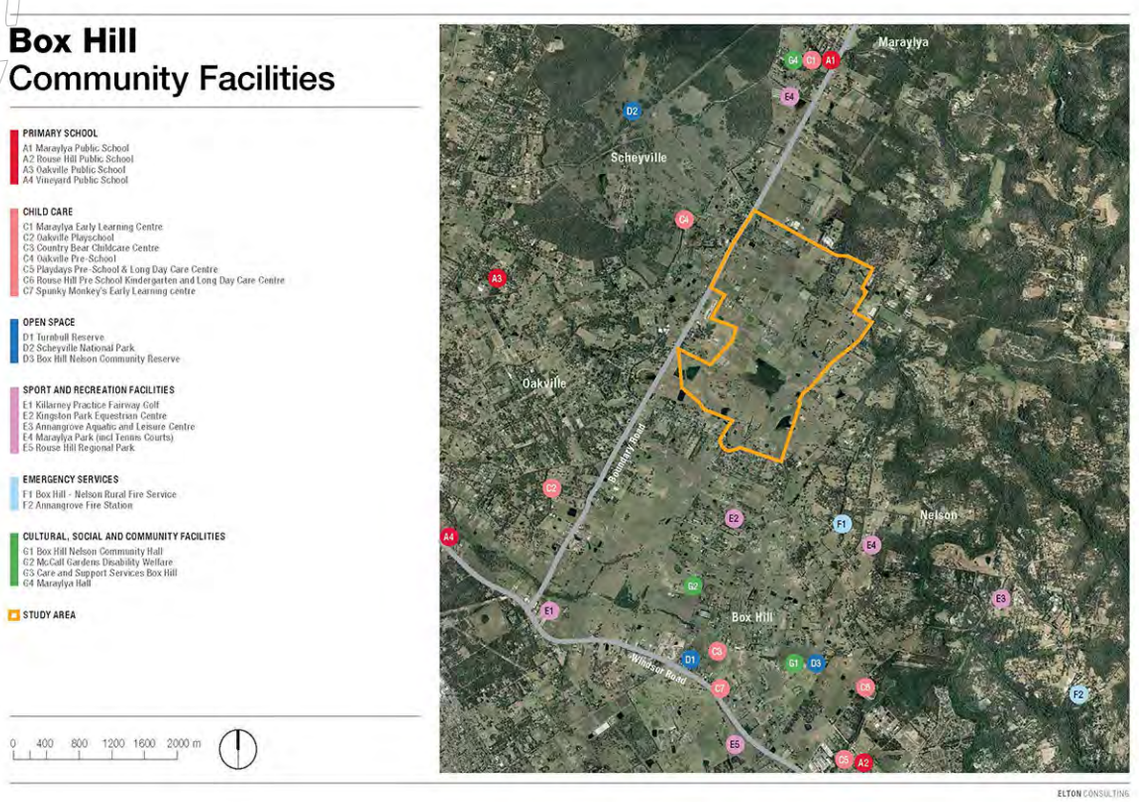


Figure 26. Proposed social infrastructure within Box Hill

SECTION 3.

Planning Proposal

3. Planning Proposal

3.1. Introduction

The Hills LEP 2012 is the principal environmental planning instrument applying to the site. Under The Hills LEP 2012, the site is zoned RU6 Transition. The key objectives of the RU6 Transition zone, as set out in The Hills LEP 2012, is to protect and maintain land that provides a transition between rural and other land uses of varying intensities or environmental sensitivities and to minimise conflict between land uses within this zone and land uses within adjoining zones. The existing LEP includes a range of development standards relating to minimum subdivision lot sizes, maximum building heights, as well as special provisions relating to a range of environmental management issues including flooding and vegetation protection.

It is proposed to rezone the site from RU6 Transition to R1 General Residential, R3 Medium Density, E2 Environmental Conservation, E3 Environmental Management, E4 Environmental Living, B2 Local Centre and RE1 Public Recreation generally in accordance with The Hills LEP 2012. The Planning Proposal also seeks to establish a number of development controls to guide future development on the site including minimum lot sizes for residential development in the R1 General Residential, R3 Medium Density, E3 Environmental Management and E4 Environmental Living land use zones and maximum height of buildings development standards.

3.2. Part 1 - Objectives and Intended Outcomes

The objectives of the Planning Proposal are:

- to facilitate redevelopment of Box Hill North in a coordinated fashion and in doing so achieve the site's highest and best use;
- to accommodate 4,100 dwellings and a 5.5 hectare town centre comprising up to 10,000m2 of retail / commercial floor space;
- to deliver a design that integrates community, transport, environmental and economic outcomes;
- to create a diverse community that is demographically balanced, responds to changing life cycle, lifestyle and work requirements over time;
- to reserve land for environmental conservation;
- to develop an open space network including active playing fields, and a connecting trail network of passive recreational spaces that capture riparian and amenity qualities; and
- to identify 2.2 hectares of land for a new primary school site.

3.3. Part 2 - Explanation of Provisions

A detailed explanation of provisions is provided in section 5. The Planning Proposal will, as far as practical, incorporate the range of presently permissible land uses within the proposed land use zones together with the introduction of additional permitted residential land uses. This is to facilitate the delivery of 4,100 dwellings on the site contributing to the housing targets identified in strategic policies for the Sydney metropolitan area and the North West subregion. The Planning Proposal seeks to deliver the highest and best use of the land in the context with its environmental attributes through a "rollover" of existing controls where possible. The introduction of new site specific development standards and controls for Box Hill North has been limited to

where an existing standard and control is an impediment to achieving the desired outcomes for Box Hill North.

3.4. Part 3 - Justification

The justification of the Planning Proposal is set out under the following probe questions asked in the Department of Planning and Infrastructure's *Guide on Preparing Planning Proposals*.

3.4.1. Need for the Planning Proposal

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

Box Hill North has been identified as a 'strategic investigation site' as part of the Department of Planning and Infrastructure's Potential Home Sites Program in March 2013, being seen as a 'strategic fit' in terms of planned growth and urban policy. Whilst the site was seen as a 'strategic fit', lack of enabling services and long lead in times and fragmented ownership posed a challenge for delivery. This has now been remedied with agreements to purchase 86% of the site and 'in principal' support with Sydney Water in relation to forward funding enabling services. The proposal is a logical extension of the recently rezoned Box Hill and Box Hill Industrial Precincts located to the immediate south of the site. As part of the Potential Home Sites Program and detailed in the Evaluation Report dated March 2013 (page 69), Council recommended that Box Hill North should be considered for future housing subject to detailed assessment.

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

The Hills LEP 2012 is the principal environmental planning instrument applying to the site. The Hills LEP 2012 was prepared in accordance with the (Standard Instrument) and was gazetted on 5 October 2012. It is considered that a stand-alone Planning Proposal is the best means of achieving the objective and intended outcome for the site.

Is the Planning Proposal consistent with the objectives and actions of the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft strategies)?

The Planning Proposal is consistent with the objectives and actions of applicable regional or sub-regional strategies including the Sydney Metropolitan Strategy. A detailed discussion of the Planning Proposal's relationship to the relevant strategies is included at section 7.

Is the Planning Proposal consistent with a Council's local strategy or other strategic plan?

The Planning Proposal is consistent with Council's Adopted Draft Local Strategy: New Strategic Direction for Baulkham Hills Shire (June 2008). A detailed discussion of the Planning Proposal in relation to Council's strategy is in Section 7.

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

State Environmental Planning Policies (SEPP) relevant to the planning proposal are:

- SEPP No.55 – Remediation of Land; and
- SEPP No.65 – Design Quality of Residential Flat Development.

A detailed discussion of the planning proposal in relation to its consistency with SEPP 55 and SEPP 65 is provided in section 7. Given the site's current and previous usage (i.e. agriculture), the potential for widespread contamination across the site is considered low, with the possible exception of asbestos. JBS Environmental has concluded that contamination on the site would not prevent the planning and development of Box Hill North for the proposed uses, consistent with the objectives of State Environmental Planning Policy No. 55 – Remediation of Land (refer to section 8 and Preliminary Site Investigation, prepared by JBS Environmental included at

Appendix B).

Is the Planning Proposal consistent with applicable Ministerial Directions (s.117 directions)?

A detailed discussion of the planning proposal's consistency with the relevant s.117 directions is included at section 7. In summary, the planning proposal is not inconsistent with any relevant s.117 direction.

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

The site contains Cumberland Plain Woodland and Shale Sandstone Transition Forest which will be affected by the planning proposal. The proposal is supported by a biodiversity strategy that will not adversely affect the site's biodiversity.

The majority of the site has been cleared due to a long history of agricultural land use and consists mainly of exotic pastures, farm dams, farm housing and infrastructure. There are six (6) patches of modified Cumberland Plain Woodland and Shale Sandstone Transition Forest within the northern portion of the site which are examples of threatened ecological communities (TECs) that are listed under both the *NSW Threatened Species Conservation Act 1995 (TSC Act)* and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).* These patches have a total area of approximately 26 hectares or 7% of the site. Cumberland Ecology have classified the condition of vegetation on the site as 'low' and moderate'.

This vegetation, together with small creeks and dams were found to provide actual and potential habitat for threatened species including the Spotted Harrier (*Circus assimilis*), Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), Eastern Freetail-bat (*Mormopterus norfolkensis*), Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*), White-bellied Sea-eagle (*Haliaeetus leucogaster*) and Cattle Egret (*Ardea ibis*). The site may also provide potential habitat for a number of additional threatened species, including habitat for the Koala (*Phascolarctos cinereus*), Green and Golden Bell Frog (*Litoria aurea*) and Cumberland Land Snail (*Meridolum corneovirens*).

The size and shape of existing woodland areas, and the fact that they are surrounded by heavily cleared and modified farmland presents a challenge for long term conservation. This is because with increased intensity of land usage, there is potential for the remaining patches to become increasingly isolated and for edge effects (e.g. encroachment of weeds, disturbance by humans) to become more significant. The Planning Proposal is supported by a strategy that will maintain or improve biodiversity values on the site. This includes a combination of 'in situ' conservation of identified woodland areas along creeks within the subject site and off-site offsetting via the purchase of Biodiversity Credits where clearing is considered unavoidable.

It is proposed to retain approximately 5.8 hectares of area of higher quality Cumberland Plain Woodland within the north-western corner of the site and approximately 12 hectares of Shale Sandstone Transition Forest within the north-eastern portion of the site, of which 3 hectares of Shale Sandstone Transition Forest is proposed to be zoned E3 Environmental Management. These areas, particularly the patch of Shale Sandstone Transition Forest are fundamental elements of the project, forming part of the proposed conservation land, riparian corridor network and open space areas for the development. These areas will be protected by an RE1 Public Open Space, E2 Environmental Conservation and E3 Environmental Management zoning under the LEP amendment.

In relation to fauna, the Shale Sandstone Transition Forest within the north-eastern portion of the site comprises the most intact and continuous wooded habitats for native fauna. This area is proposed to be zoned part RE1 Public Open Space and part E3 Environmental Management.

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

An environmental assessment of the Planning Proposal in relation to the following factors has been considered:

- Transport and Access assessment;
- Flora and fauna;
- Water cycle management including flooding, surface water, groundwater quality and riparian corridors;
- Services and Utilities;
- Geotechnical, soils and contamination assessment;
- Aboriginal heritage assessment;
- Social planning assessment;
- Bushfire risk assessment;
- Retail analysis; and
- European heritage.

In summary, the Planning Proposal does not result in any significant adverse environmental impact.

Has the Planning Proposal adequately addressed any social and economic effects?

A discussion of the planning proposal's social and economic effects is provided in sections 8 and 9 and the Retail Analysis, prepared by Location IQ included at **Appendix H**. In summary, the proposal has a number of positive social and economic impacts, namely:

Social Impacts

- delivery of additional residential (approximately 380 hectares) and employment land in North-West Sydney;
- provision of housing diversity for a full range of household types and lifestyle preferences;
- creation of an environment that provides access to public and private spaces and promotes healthy lifestyles, facilitating a vibrant, robust, sustainable community;
- public benefits including additional public open space, sporting grounds, community centre;
- provision of physical and social infrastructure to the site.

Economic Impacts

- a large portion of main trade area residents will be serviced by the existing and future centres including Rouse Hill and Box Hill town centre;
- provision of retail floor space including supermarket and retail specialty;
- provision of non-retail specialty, commercial/office, medical centre, childcare, tavern, petrol station and gym;
- retail activity centre will be positioned in close proximity to higher density residential;
- based on population projections and take-up rate, a supermarket based centre would be supportable at Box Hill North by 2021;
- there is potential for a centre of up to 10,000 m2 to be supportable at Box Hill North; and
- existing larger facilities in the region would continue to provide the major retail destination for the future Box Hill North residential population.

Furthermore, the proposal will:

- provide employment opportunities on the site by providing up to 10,000m2 of non-residential floor space;
- increase employment opportunities during the roll out and construction phase;
- increase the demand for local employment opportunities from the 4,100 households located

Box Hill North; and

- during construction and once completed generate additional economic activity both locally and outside of the area.

Is there adequate public infrastructure for the Planning Proposal?

The Planning Proposal is supported by a clear and viable infrastructure servicing strategy that leverages readily accessible existing infrastructure and demonstrates that the project can be implemented as a standalone proposal.

The Project presents an opportunity to provide infrastructure and high quality new facilities in a timely manner based on leading practice sustainability principles and sustainable funding, management and maintenance arrangements. A detailed discussion in relation to public infrastructure is included at section 8 and the Infrastructure Services Assessment, prepared by J Wyndham Prince and included at **Appendix I**.

In summary, Box Hill North will require the construction of a Sewerage Pumping Station (SPS). The location of this SPS is likely to be adjacent to Maguires Road at the northern end of the site. Sydney Water are currently undertaking extensions to the trunk sewerage infrastructure within the Chain-of-Ponds Creek system that includes a large diameter sewer carrier from near Boundary Road to Vineyard and thence via a new SPS to Riverstone West Wastewater Treatment Plant (WWTP). Sydney Water has confirmed that this system can accommodate the proposed development of the Box Hill North Precinct (via the new SPS at Maguires Road).

The existing potable water service within the site is appropriately sized for the rural residential development. A significant amplification of this system will need to occur with the development of the site. Sydney Water has confirmed that the bulk supply to the site can occur from the Rouse Hill Elevated Reservoir; however the local supply may require a new reservoir close to the site. It is proposed that a new surface reservoir be installed at the Oakville Reservoir site with a new supply line from Rouse Hill. Construction and planning of the new Surface Reservoir and Supply Main will be undertaken directly with Sydney Water and the developer of the site.

Utility providers Endeavour Energy, Jemena and NBN Co have confirmed that the site can be serviced with regard to electricity, gas and telecommunications, respectively.

What are the views of state and Commonwealth public authorities consulted in accordance with the Gateway determination?

As discussed in section 1, consultation has been undertaken with Council and relevant government agencies during the preparation of the Planning Proposal and supporting technical studies investigations, including:

- Department of Planning and Infrastructure;
- Office of Environment and Heritage;
- Department of Education and Communities (in relation to the proposed school site);
- Department of Transport;
- The Hills Shire Council
- Transport NSW (Roads and Maritime Services);
- NSW Rural Fire Service;
- Sydney Water;
- NSW Police; and
- NSW Fire.

A copy of relevant correspondence is included at **Appendix I**.

SECTION 4.

Indicative Layout Plan

4. Indicative Layout Plan

The Vision for Box Hill North is to create a new well-connected, living and diverse community that supports a vibrant town centre in the heart of the neighbourhood. Nestled within the undulating landform to the north of the recently release Box Hill and Box Hill Industrial Precincts, Box Hill North will establish the following key principles:

- creating a living and happy community;
- establishing a vibrant Town Centre;
- connecting the community; and
- growing a sustainable living environment.

An Indicative Layout Plan (ILP) for Box Hill North has been prepared by Design IQ to demonstrate the capability of the site to accommodate the vision and to guide future planning (refer to Figure 27). The main features of the ILP that relate directly to the key principles are:

- Creating a living and happy community:
  - Urban Structure
  - Residential
  - Open Space
- Establishing a vibrant town centre:
  - Employment
  - Town Centre and Entertainment
- Connecting the community:
  - Road Network
  - Public Transport
  - Pedestrian / Cycleway Network
- Growing a sustainable living environment:
  - Environment
  - Water Cycle and Flood Management
  - Bushfire Management

4.1. Creating a Living and Happy Community

The ILP for Box Hill North will provide for an accessible town centre, a connected open space and pedestrian network, and a mix of housing types to meet the needs of the new community. However, the ultimate success of any residential development is based on the community's acceptance and enjoyment of the neighbourhood. The key components of a living and happy community is the fundamental structure of the neighbourhood, the size and type of housing and access to open space.

4.1.1. Urban Structure

Box Hill North will have its own identity primarily due to the ridgeline along Old Pitt Town Road that separates it from the Box Hill precinct. Being on the northern side of this ridgeline presents the site with an aspect that focuses on distant views of the Blue Mountains, bushland and a rural

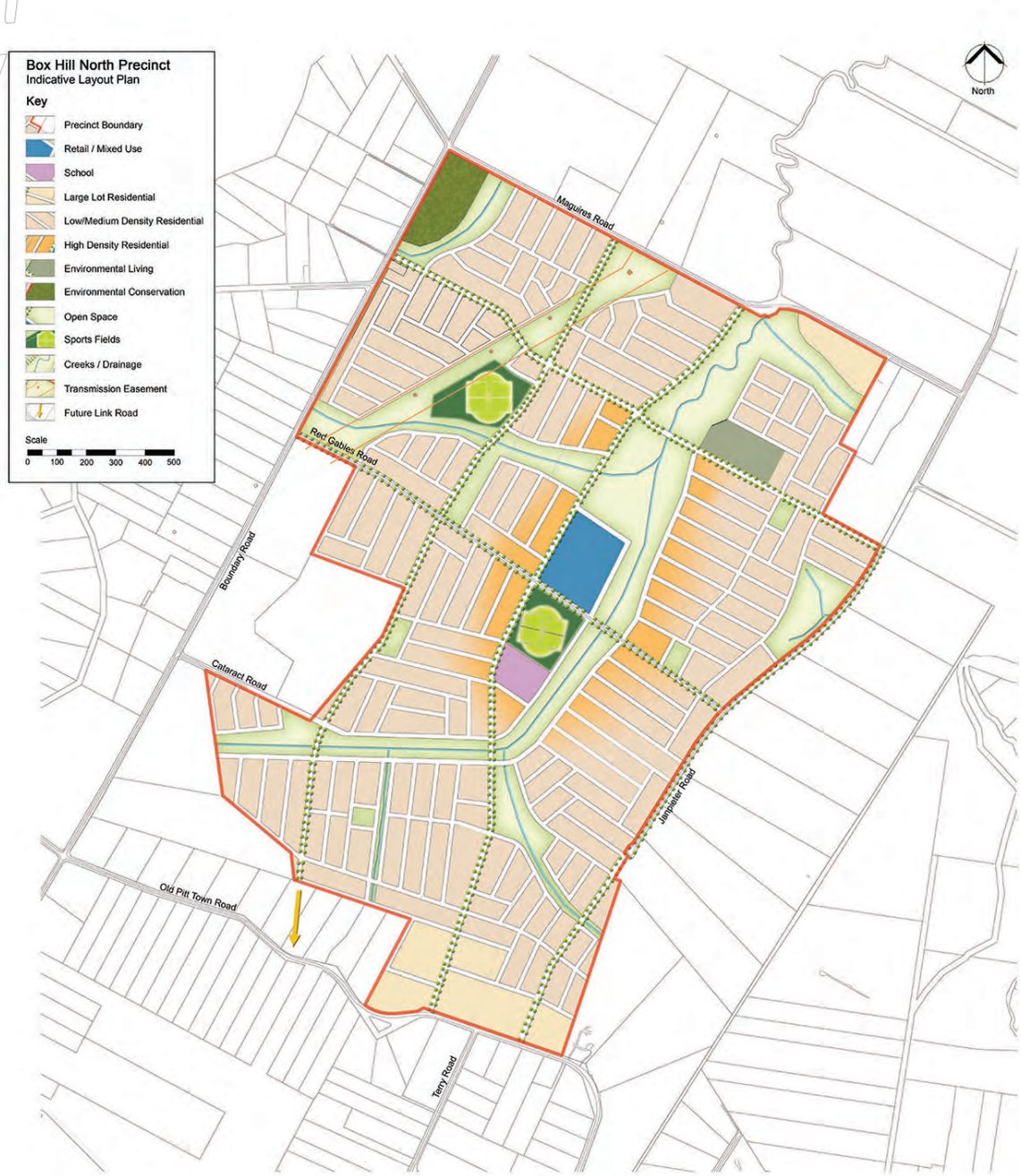


Figure 27. Indicative Layout Plan

environment to the north, east and west. The urban structure has been designed to celebrate these features by incorporating them into a central parkland spine for the development, which converges in the centre of the site with a gathering place for the community. This gathering place being the active and passive parklands, wetland features, school and town centre which will incorporate retail and restaurants. The movement network is deliberate with the open space corridors being used as a means to travel to this precinct centre by walking or cycling. This open space linkages will be framed by higher density housing forms, which will focus around the town centre to increase people activity and make the most of the parkland setting for future residents to enjoy.

The Indicative Layout Plan as shown in Figure 27 below, illustrates the urban structure. The key features of the urban structure are:

- Utilisation of all existing roads (i.e. Boundary Road to the west, Old Pitt Town Road to the south, Cataract Road, Red Gables Road, Maquires Road and Janpieter Road to the east) and the envisaged extension of others (i.e. Terry Road and Mount Carmel to the south) to create an interconnected grid network.
- A centrally located town centre with capacity for up to 10,000m2 of retail, office and business floor space and surrounded by sporting fields to the south, pond and open space to the north and east. The town centre is likely to include supermarket, retail, office, hotel, petrol station, medical centre and child care centre.
- A primary school site that is also centrally located and is immediate south of sporting fields and town centre.
- Retention of approximately 5.8 hectares of area of higher quality Cumberland Plain Woodland within the north-western corner of the site and approximately 12 hectares of Shale Sandstone Transition Forest within the north-eastern portion of the site.
- Distribution of residential densities types across the precinct to match site opportunities.
- A passive recreation network that extends from the site's south-west to north-west corner and provision of open space along the existing transmission line easement within the site's north-west corner.

4.1.2. Residential

Box Hill North will provide a mix of housing types ranging from residential flat buildings, through traditional single lot residential dwellings to large lot residential dwellings, to provide housing diversity and choice to meet the needs of the community. These housing types may change over time as market interest and demand changes to match new architectural designs and functional layout as developed to adapt to energy efficiency and passive solar awareness. The residential housing density for Box Hill North is approximately 20 dwellings per net developable area (hectare).

The higher density housing types will be concentrated closer to the Town Centre and adjoining open space areas and will have a maximum building height of 18 metres (5 storeys). While the medium and lower density housing types will be located on the fringes, and topographical sensitive areas, and will have a maximum building height of 12 and 10 metres respectively (2 – 3 storeys). Although it is not anticipated to development to the maximum height for the entire residential area, it does allow for architecture design elements within the dwelling treatments to add interest to the overall streetscape.

Distribution of residential areas are proposed as follows:

- higher residential densities located within and adjacent to the town centre to maximise access to services and public transport and in areas with high visual or landscape amenity;
- pockets of large lot residential development (environmental living) along ridges and steeper slopes to maximise scenic outlook, better conserve existing landform and patches of vegetation and provide a transition from existing and planned large lot residential development to the south;
- a pocket of environmental management land is proposed to the east of the main north-

- south riparian corridor; and
- provision of medium density residential development throughout the remainder of the site.

Table 6 outlines the net residential areas (excluding roads) in the ILP and the estimated housing yield.

Table 6. Proposed Dwelling Mix and Dwelling Yield

Product Type	Target	No of Dwellings
Traditional Lot 18 x 30m – 540m2	28%	1148
Courtyard Lot 15 x 30m – 450m2	37%	1517
Villa Lot 10 x 30m – 300m2	23.25%	953
Rear Loaded 6m x 30m -180m2 (50%) 7.5m x 30m – 225m2 (50%)	4.75%	195
Environmental Zone (2000m2)	0.25%	15
Low Density Residential (2000m2)	2%	84
Residential flat buildings	4.75%	200

Product Type	Target	No of Dwellings
Total	**100**	**4,112**

4.1.3. Open Space

Open space provides an important role in the health and well-being of the community. The open space network is structured along a central spine that connects all key features to the community. The ILP provides for active open space / sports fields, local parks and a passive recreational trail network (refer to Figure 28).

Active Parks

The ILP identifies two (2) active parks that incorporate sporting fields, one being in the north-western corner of the site, near the existing transmission line easement and the second being to the immediate south of the proposed town centre. These spaces are likely to comprise multi-purpose sports uses, playgrounds, parking facilities and amenities.

Local Parks

The ILP identifies four (4) local parks evenly distributed throughout the site and within a 5 minute walking distance to all residential areas. The local parks are likely to accommodate children playgrounds, passive areas, picnic and BBQ areas, densely vegetated areas and / or small kicking grounds. The central park, to the north of the town centre, will be an important place for the local community and offers high levels of amenity being situated around a proposed lake north of the town centre.

Passive Recreation

Passive recreation is provided through integrating water management facilities with the riparian function of streams and passive recreation areas. Riparian parks will be appropriately vegetated to create the amenity of a natural bushland setting. Where appropriate, these parks will include shared pathways, seating, small playgrounds, fitness pods and BBQs. These spaces will be an integral feature of the urban design, connecting the community to the town centre and playing fields, encouraging walking and cycling. These areas will also provide high levels of amenity for surrounding planned residential areas.

Figure 28. Location of Open Spaces

4.2. Establishing a Vibrant Town Centre

The ILP proposes a centrally located Town Centre to maximise its accessibility to the surrounding community. The aim is to create a compact, vibrant, safe and prosperous town centre to supply the retails needs of the community and provide the civic focus. The town centre will be supported by an integrated access network, higher density residential housing in close proximity and an appropriate mix of land uses.

4.2.1. Employment

The Town Centre has the potential to employment a significant number of jobs through the various retail and commercial activities. The ultimate number will be subject to future consideration during development assessment process.

4.2.2. Town Centre and Entertainment

The Town Centre will form the heart of the precinct, and the community. It will be a modern centre providing a functional and easily accessible town centre shopping experience. It will consist of retail and commercial activities supported by an entertainment precinct with restaurants and cafes, overlooking an open space network and urban park. There will also be an active sporting field and primary school in close proximity to the town centre to add to the centre's vitality and energy.

Based on the future population growth within the region, it is considered that a centre of around 7,750 square metres would be supportable up to 2026 to an ultimate capacity reaching beyond 10,000 square metres. The retail component would be anchored by a full-line supermarket of 4,000 square metres, and supported by speciality retail and other non-retail and commercial floor space.

Although the ultimate functional layout and design of the town centre will be subject to a future development application process, two functional concepts have been prepared to illustrate the principles of good town centre planning (refer to Figure 29).

4.3. Connecting the community

4.3.1. Road Network

The ILP is characterised by a permeable street network, which incorporates existing roads. New streets are located to respond to the topography and gradients (refer to Figure 30). Streets are located along parks and riparian corridors to ensure passive surveillance and pedestrian/cycle connectivity through the site. The proposed street network and road hierarchy is described in Table 7.

The ILP illustrates that vehicular access to Box Hill North will be provided from Boundary Road to the west and Old Pitt Town Road to the south with the following intersections:

- Boundary Road/ Maguires Road/ Cusack Road (Existing);
- Boundary Road/ BHN Access Road (Proposed);
- Boundary Road/ Red Gables Road (Existing);
- Boundary Road/ Cataract Road (Existing);

Indicative Layout Plan - Box Hill North Town Centre Example A - At Grade Parking

Indicative Layout Plan - Box Hill North Town Centre Example B - Basement Parking

Figure 29. Indicative layout options for Town Centre

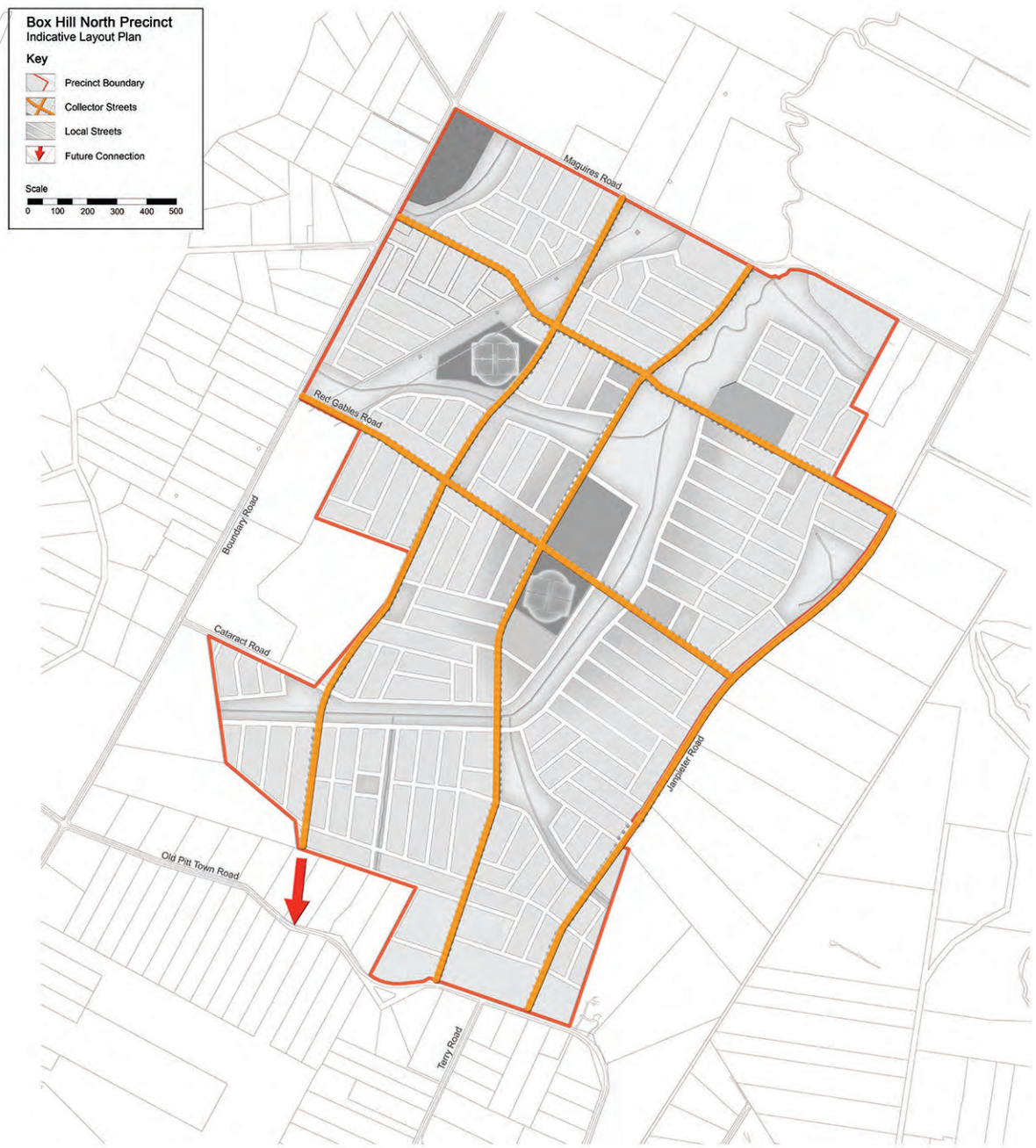


Figure 30. Proposed Road Hierarchy

- Old Pitt Town Road/ BHN Access Road West (Proposed); and
- Old Pitt Town Road/ BHN Access Road East (Proposed).

Table 7. Proposed Street Types

Street Type	Description
Collector Road	Collects traffic from local streets and carries a higher volume of traffic, linking neighbourhoods and centres and accommodating public transport routes. Amenity and safety is to be maintained by restricting vehicle speeds through traffic-calming measures and intersection design. Intermittent parking with landscaping is provided on both sides of the street. Refer to Figure 31.
Local Street	Provide local residential access. These streets are designed to slow residential traffic in order to give priority to pedestrians. Amenity and safety is to be maintained by introducing various traffic calming measures. On-street parking is provided on both sides of the street. Refer Figure 32.
Rear Lane	Provide access to developments fronting sub-arterial and collector roads and also to medium density developments. Rear lanes will provide access for servicing. Refer to Figure 33.

4.3.2. Public Transport

The ILP road network allows for the provision of bus services through the neigbourhood. The 2009 North West Sector Bus Servicing Plan, propose two new district bus routes in the vicinity of Box Hill North:

- Route D2: Rouse Hill – Withers Road – Box Hill; and
- Route D3: Rouse Hill – Box Hill – Riverstone.

District bus routes provide services every 30 minutes during weekday peaks and 60 minutes off-peak, however they do not run into the evening. These routes ensure 90 per cent of residents are within 400 metres of a service. The routes are anticipated to be revised with the introduction of passenger rail services at Cudgegong Road station as part of the North West Rail Link. Figure 34 illustrates the indicative extensions to bus routes D2 and D3 to serve Box Hill North and ensure that more than 90 per cent of residents are within the service catchment.

The extension of Bus Route D2 to Box Hill North passes through a future connection of the Mount Carmel Road link into Box Hill North. Bus routes are proposed within 400 metres of all areas and at key intersections. A regional bus route will link Box Hill North to the Box Hill Town Centre to the south of the site, Rouse Hill and Riverstone through the sub-arterial roads.

4.3.3. Pedestrian / Cycleway Network

Connectivity to the Town Centre and the open space network is one of the key principles that underpin the urban structure of the precinct. The open space and road networks provide the fundamental linkages for pedestrian and cyclists. An interconnected off-road shared pathway system for pedestrians and cyclists are proposed along sub-arterial roads, collector roads and streets fronting open spaces. The proposed cycle and pedestrian network is shown in Figure 35.

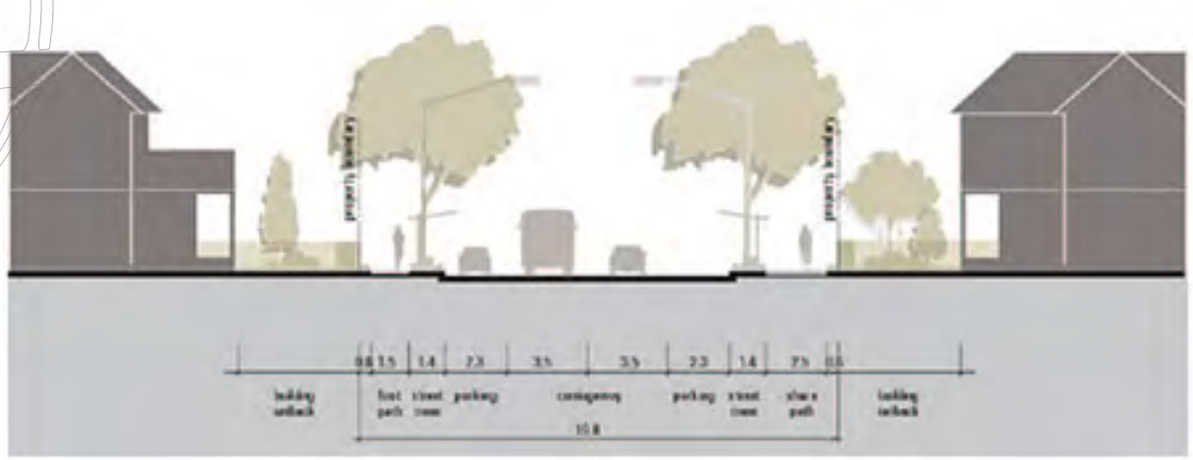


Figure 31. Typical Collector Road

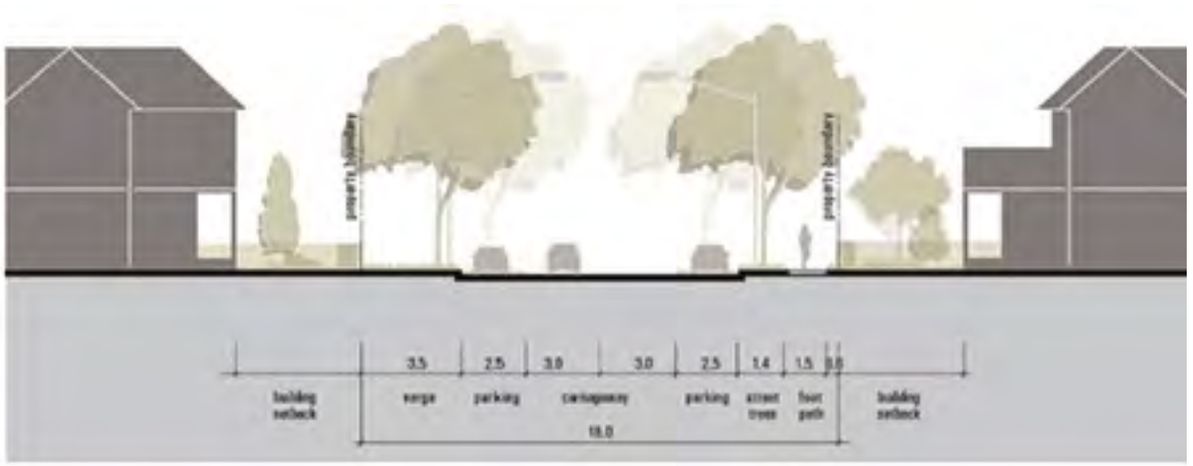


Figure 32. Typical Local Street

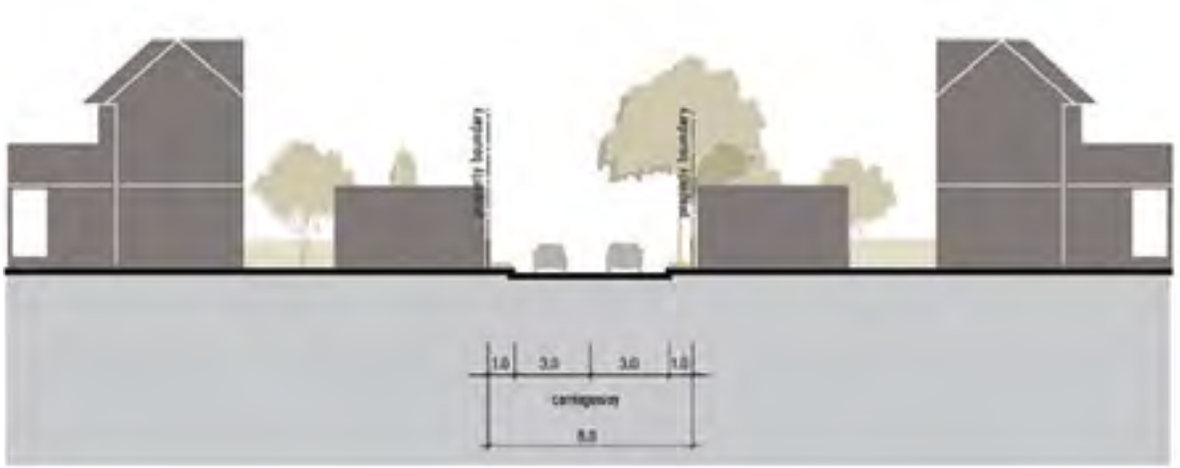


Figure 33. Typical Rear Lane

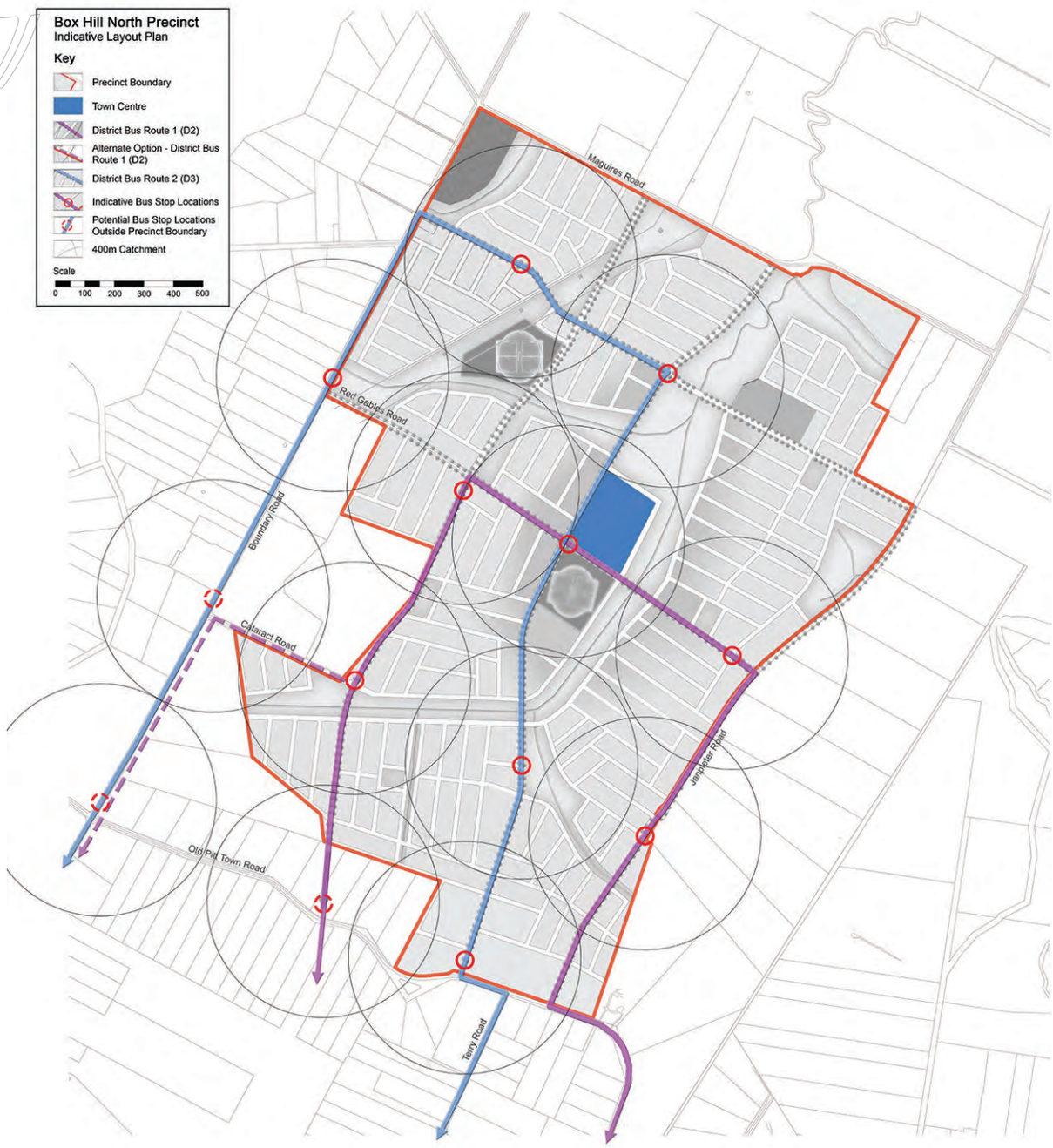


Figure 34. Public Transport

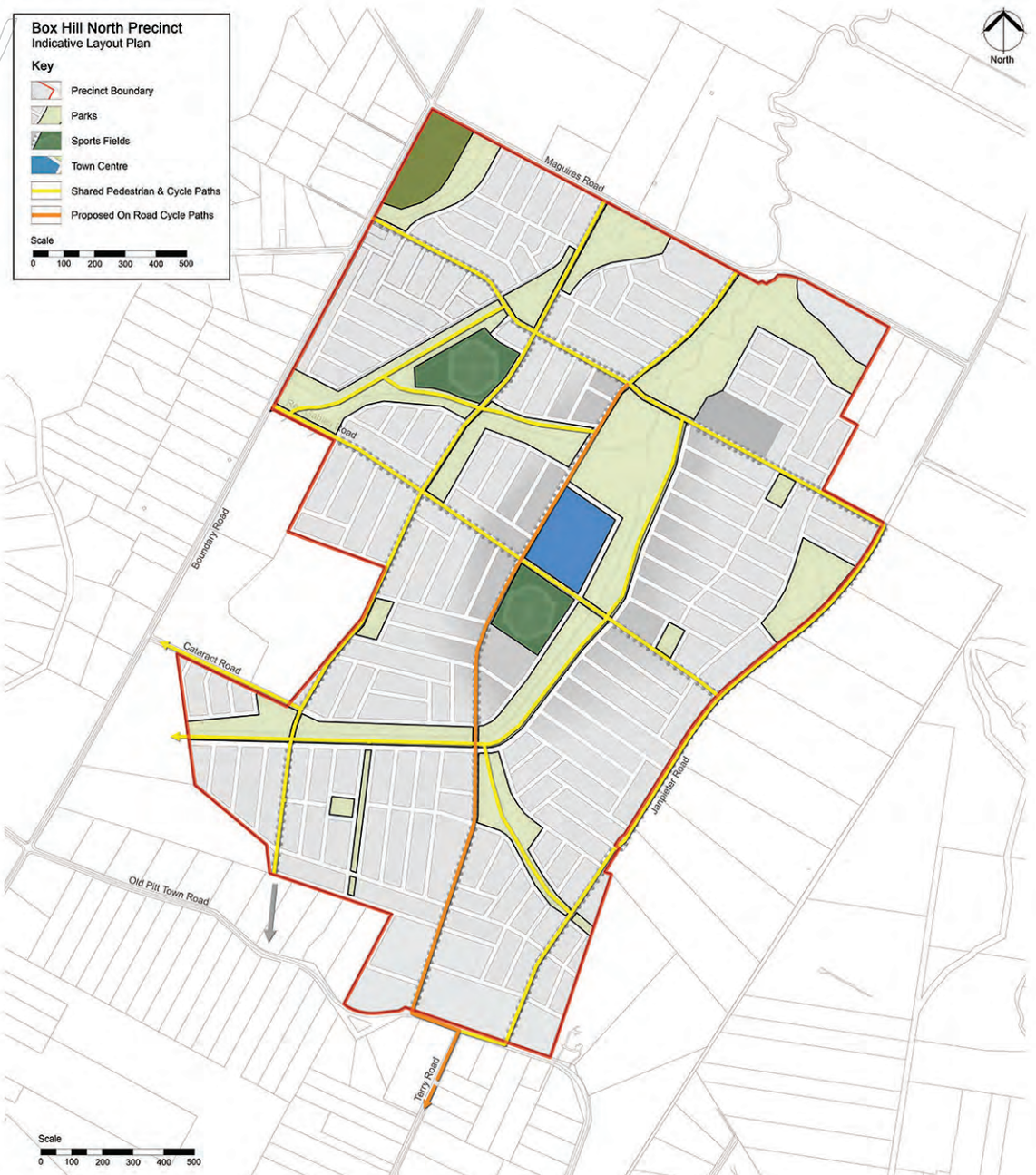


Figure 35. Pedestrian and Cycle Ways

4.4. Growing a Sustainable Living Environment

4.4.1. Environment

An options assessment has been undertaken in considering the conservation strategy for the Cumberland Plain Woodland and Shale Sandstone Transition Forest on the site. The analysis has involved balancing good urban design outcomes for a sustainable and cohesive community and adopting a 'maintain or improve' approach for these ecological communities. The proposal has sought options for rezoning that aim in the first instance to maximise the in-situ retention of biodiversity values as far as practicable, particularly the CPW and SSTF patches identified in the NGH assessment.

4.4.2. Water Cycle and Flood Management

The water cycle and flood management strategy proposed for the Box Hill North is functional, delivers the required technical performance, lessens environmental degradation and pressure on downstream ecosystems and infrastructure, and provides for a 'soft' sustainable solution for stormwater management within the release area. The water cycle and flood management strategy for the site has been prepared by J. Wyndham Prince and is included at **Appendix J**.

The strategy focuses on mitigating the impacts of the development on the total water cycle and maximising the environmental, social and economic benefits achievable by utilising responsible and sustainable stormwater management practices. A range of stormwater management techniques and options considered for the management of nutrients and suspended solids discharging from the site are summarised below.

Management Technique	Relevance for Box Hill North
Vegetated Swales and Buffers	The grade of the land within certain portions of the Box Hill North is suitable for swales and buffers less than (< 3%), in particular on the fringes of the riparian corridors. However, swales and buffers within urban residential streets are not recommended due to the large number of culvert crossings required for driveways, safety concerns, increased number of GPT's required and significant maintenance requirements. Swales within central road medians, if provided within the development, may be appropriate.
Sand filters	Sand filters are generally suited to smaller catchments. They are inefficient when compared to bio-retention systems and require frequent maintenance
Permeable pavement	Permeable pavements are generally a more 'at source' solution and best suited as an 'on lot' approach or for small roadway catchments. Permeable pavers may possibly be considered at the development application stage for on lot treatment or for areas draining small catchment areas with low sediment loads and low vehicle weights. These systems are also prone to clogging and are not suitable in saline soils that may be encountered at Box Hill North and are therefore unlikely to be recommended for the site.
Infiltration trenches and basins	Infiltration trenches and basins are not appropriate for clay soils or where there is potential for salinity issues. Infiltration trenches and basins are therefore unlikely to be suitable for Box Hill North.

Management Technique	Relevance for Box Hill North
Constructed wetlands and ponds	Wetlands and ponds are effective in removing sediment and nutrient loads typically generated from urban development. They do however require a large footprint area in relation to the catchment size. Wetlands and ponds generally also require a significant amount of maintenance. They are susceptible to algal blooms and require recirculation systems. Consideration of public safety measures is also required due to permanent deep water areas.
Base flow management basins	Base Flow Management Basins are effective in removing sediments and nutrient loads typically generated from urban development. These devices are effective at ensuring that increase stream forming flows from urban development are reduced.
Bio-retention systems	Bio-retention systems are an effective and efficient means of treating pollutants from urban development when part of an overall treatment train. Bio-retention systems require a reasonable amount of maintenance during the vegetation establishment phase.
Cartridge Filtration Systems	Cartridge filtration systems are an efficient means of treating pollutants from urban development as they are typically located underground and therefore do not require additional land take. As cartridge systems have a low treatable flow rate, additional 'buffer' storage is usually provided to keep the capital costs down. Cartridge filtration systems also need to be supplemented with additional treatment devices to achieve pollutant reduction targets. This requires significant height differences between the inlet to the filtration system and the discharge point from the supplementary system. It also generally results in expensive capital and ongoing maintenance costs.
Rainwater tanks	Rainwater tanks are effective in removing suspended solids and a small amount of nutrient pollutants. They are also effective in reducing overall runoff volumes. The effectiveness of rainwater tanks is also increased when plumbed in for internal use.

To maintain stormwater quality at the required levels, a 'treatment train' approach is proposed where various types of pollutants are removed and flow volumes and discharge rates are managed by a number of devices acting in series. The stormwater management treatment train will consist of the following elements:

Water Efficiency	Proposed for Box Hill North
On lot Treatment	Elements proposed include: • Implementation of water efficient fittings and appliances • Minimisation of impervious areas. • provision of rainwater tanks
Water Quality Measures	
Street level treatments	
Inlet Pit Filter Inserts and Gross Pollutant Traps (GPTs)	GPT devices are to be typically provided at the outlet to stormwater pipes. These systems operate as a primary treatment to remove litter, vegetative matter, free oils and grease and coarse sediments prior to discharge to downstream (Secondary and Tertiary) treatment devices. They can take the form of trash screens or litter control pits, pit filter inserts and wet sump gross pollutant traps

Water Efficiency	Proposed for Box Hill North
Subdivision / Development Treatment	
Swales	Four (4) swales are proposed on the fringes of the riparian corridors. The swales will collect and convey base flows from selected catchments and discharge them to the bioretention systems and raingardens for further treatment. Swales would typically be 0.3m – 0.5m deep (0.3m depth conservatively adopted in the MUSIC modelling). It is assumed that the swales would be sized to convey the 3 month ARI flow as a minimum. It is also assumed that trash and gross sediments will be effectively removed prior to entering the swales by the proposed GPT units.
Bio-retention Systems and Raingardens	Twenty (20) regional scale bio-retention systems and 'rain gardens' are proposed within the development (refer to Figure 36). Rain gardens are large scale, non-linear bioretention systems. The systems will be appropriately sized to achieve the nutrient reduction targets outlined in the Office of Environment and Heritage draft guidelines (2006). The bio-retention systems and rain gardens will also attenuate first flush flows to reduce the risk of stream erosion within the water courses. The media beds of the bio-retention systems are typically 500 - 600mm deep with an average particle size of 0.5 mm, a minimum hydraulic conductivity of 100 mm/hr and minimum depth of storage above the media of 300 mm.
Pond	One (1) pond is proposed for Box Hill North, located at the confluence of the two main water courses within the central portion of the site. The pond will provide multiple benefits to the site including, aesthetics, water quality, potential stormwater harvesting and reuse opportunities and minor volume management. The final configuration of the pond may also include wetland planting appropriate locations, however has been conservatively considered as a pond only for the purpose of the current assessments. Stormwater flows up to at least the 3 month ARI will be treated by a combination of other water quality devices prior to entering the lake. It is assumed that the lake is approximately 4 hectares in area, will have an extended detention depth of at least 300mm and a hydraulic retention time of 8 hours. A discharge control structure can be configured (during the Development Application process) to promote extended detention times if required.
Water Quantity (Flood Control) Measures	
Subdivision / Development Treatment	
Detention Basins	Peak storm flow attenuation up to the 100 year ARI event is addressed through the provision of six (6) online and offline detention storages located within the site. Two (2) of these basins are designed to manage 2 year ARI peak flows, with excess flows overtopping into an adjacent basin for attenuation up to the 100 year ARI event.
Stormwater Erosion Index	Limiting the post development stream forming flow duration so that it is no more than 3.5 – 5 times that of the pre-development stream forming flow duration.

Detailed concept designs were prepared for each of the proposed combined detention / water quality basins. The detailed concept designs for the combined detention / water quality basins and estimate of costs for the basins and water quality devices are included in **Appendix J**.

Figures 36 and 37 illustrate the general location of water quality and water quantity treatments.

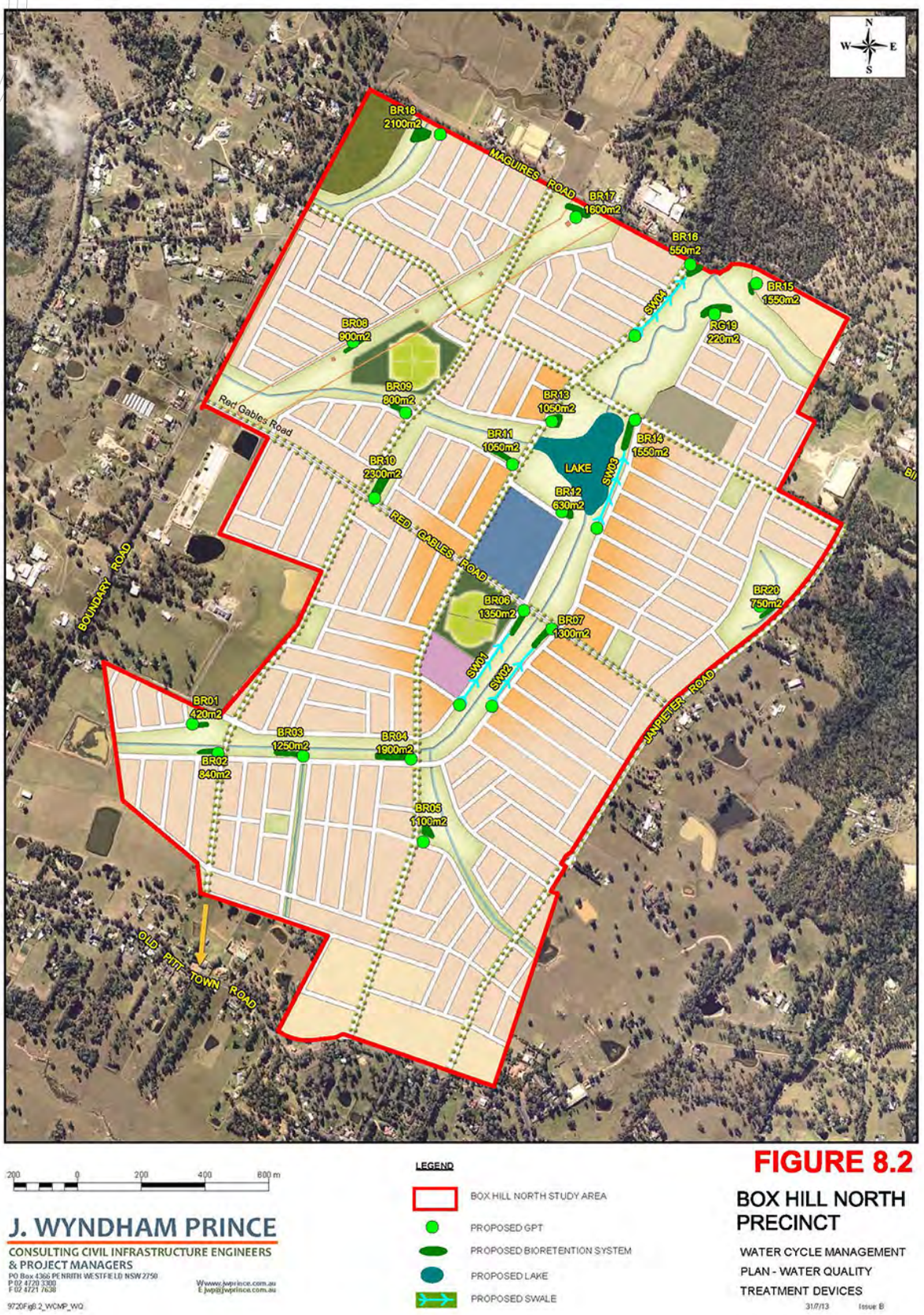


Figure 36. Indicative location of water quality treatment devices

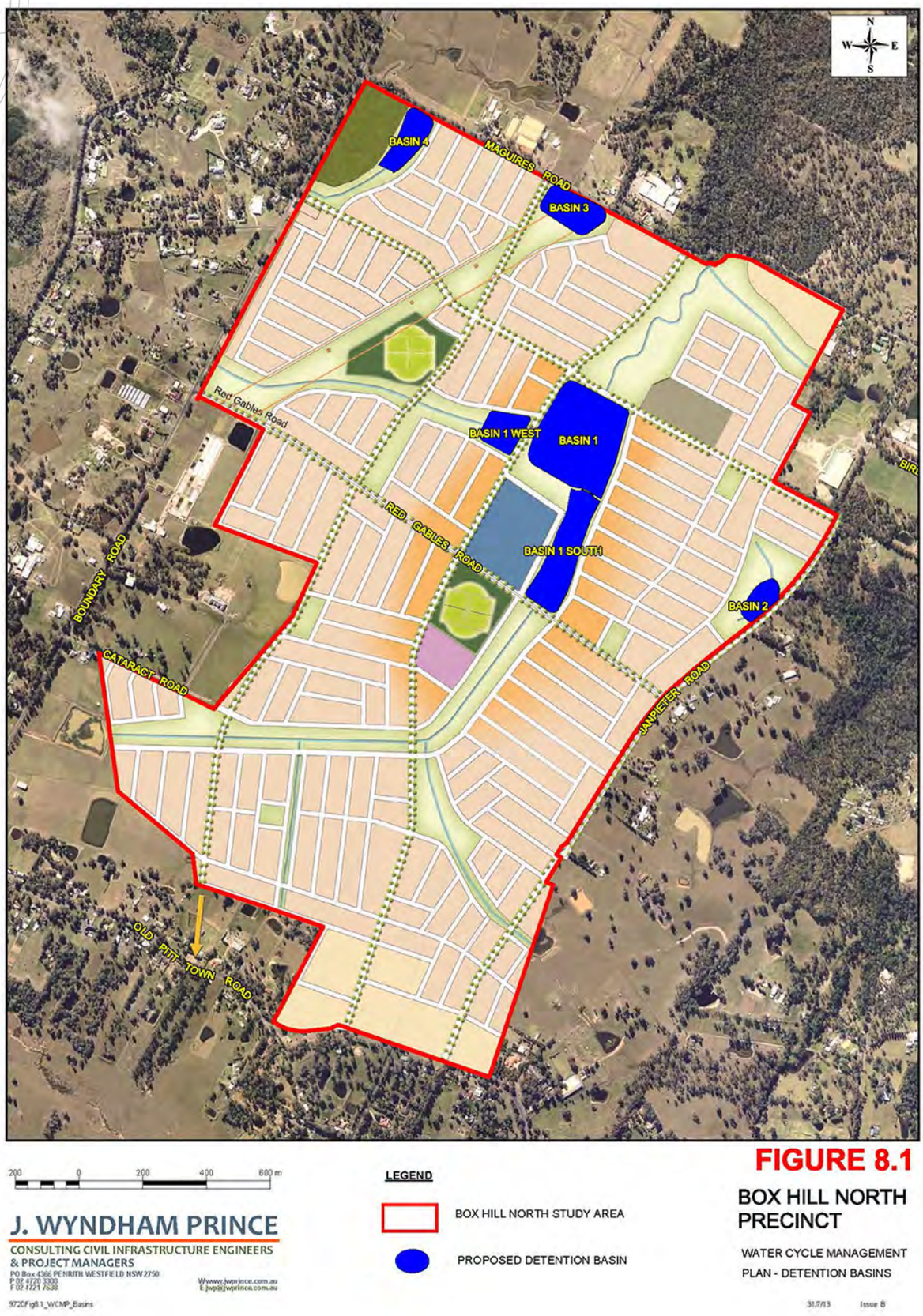


Figure 37. Indicative location of detention basins

4.5. Bushfire Management

Residential and Special Fire Protection Purposes (SFPP) APZs for the site identify the main areas of risk and have been recommended according to the specifications contained within the Planning for Bushfire Protection (NSW Rural Fire Service 2006). They are located along riparian corridors and open spaces with retained native vegetation (refer Figure 38). The size of each zoning parcel is large enough to accommodate the required APZs and an adequate perimeter road system can meet setback, access and egress requirements. APZs will be wholly contained within the perimeter road easement and standard residential setbacks. The APZ for areas that have roads fronting the riparian corridors will comprise the vegetated buffer in the proposed riparian zone and the street fronting the riparian corridor.

Figure 38. Indicative Asset Protection Zones

4.6. Indicative Staging

Figure 39 identifies the manner in which the 4,100 dwellings are intended to be delivered within the site. For each stage, there will be a series of sub-stages (i.e. 1A, 1B). The development of Box Hill North will commence in the north. On average each sub-stage is expected to comprise approximately 250 lots. Each future residential neighbourhood within the overall development will contain a range of lot sizes and a variety of housing types. Physical infrastructure including roads, parks, drainage and community infrastructure will also be delivered on a stage by stage basis.

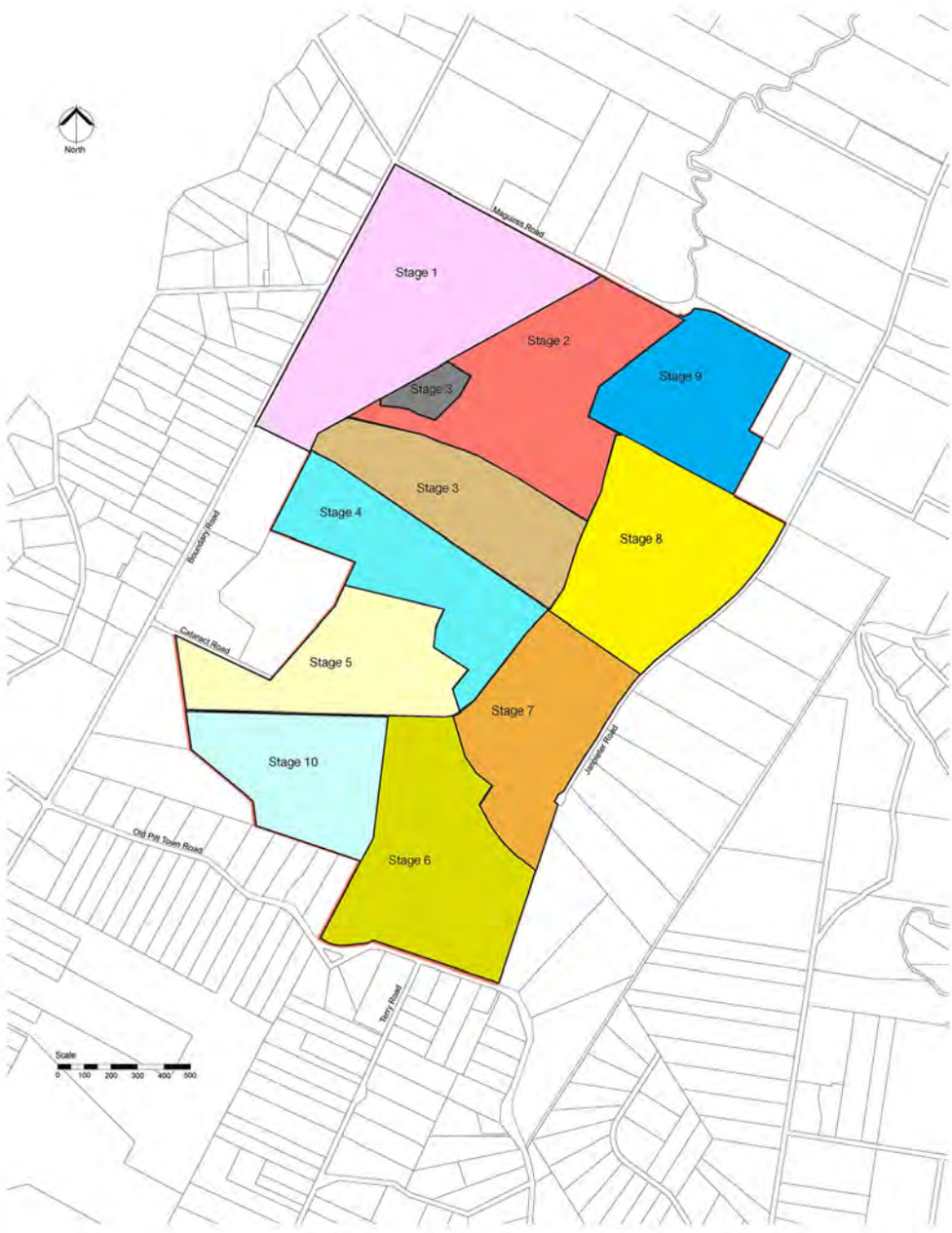


Figure 39. Indicative Staging

SECTION 5.

Proposed LEP Amendment

5. Proposed LEP Amendment

5.1. Land to which LEP amendment will apply

A draft Land Application Map is provided at Figure 40. The draft Land Application Map illustrates the land that is to be included in the LEP Amendment.

5.2. Proposed Land Use zone

It is proposed that the following land use zones be applied to the land:

- R1 General Residential;
- R3 Medium Density;
- B2 Local Centre;
- RE1 Public Recreation;
- E3 Environmental Management; and
- E4 Environmental Living.

A Draft Land Zoning Map illustrating the intended location of each proposed land use zone is provided at Figure 41.

The proposed development that is intended to be permissible without consent, with consent or prohibited in each zone is shown in Table 8. The relevant zone objectives are also shown. The provisions of Table 8 are consistent with The Hills LEP 2012.

It is noted that the existing The Hills LEP 2012 land use table adopts the approach for the residential and centres zones of identifying development that is permissible with or without consent, and then prohibiting all development otherwise not specified. Consistent with the DoPI's LEP Practice Note PN 06-002, the proposed land use tables for the R1, R3 and B2 zones have been drafted to maximise the range of appropriate uses that are permissible with or without consent in the residential, business and special purposes zones by listing the Standard Template mandated uses, and then:

- Specifically listing any uses that may be undertaken without consent under Item 2 as 'Permitted without consent',
- Specifically listing any land uses that are prohibited under Item 4, and
- Allowing all other unnamed (i.e. inominant) uses under Item 3 as 'Permitted with consent'.

Also in accordance with LEP Practice Note PN 06-002 the land use tables for the E3, E4 and RE1 zones specify permitted uses and prohibits other development, thereby minimising the need to undertake 'spot rezonings' or other ad hoc LEP amendments over time to permit additional acceptable uses that were not anticipated during the initial LEP preparation.

Figure 40. Draft Land Application Map

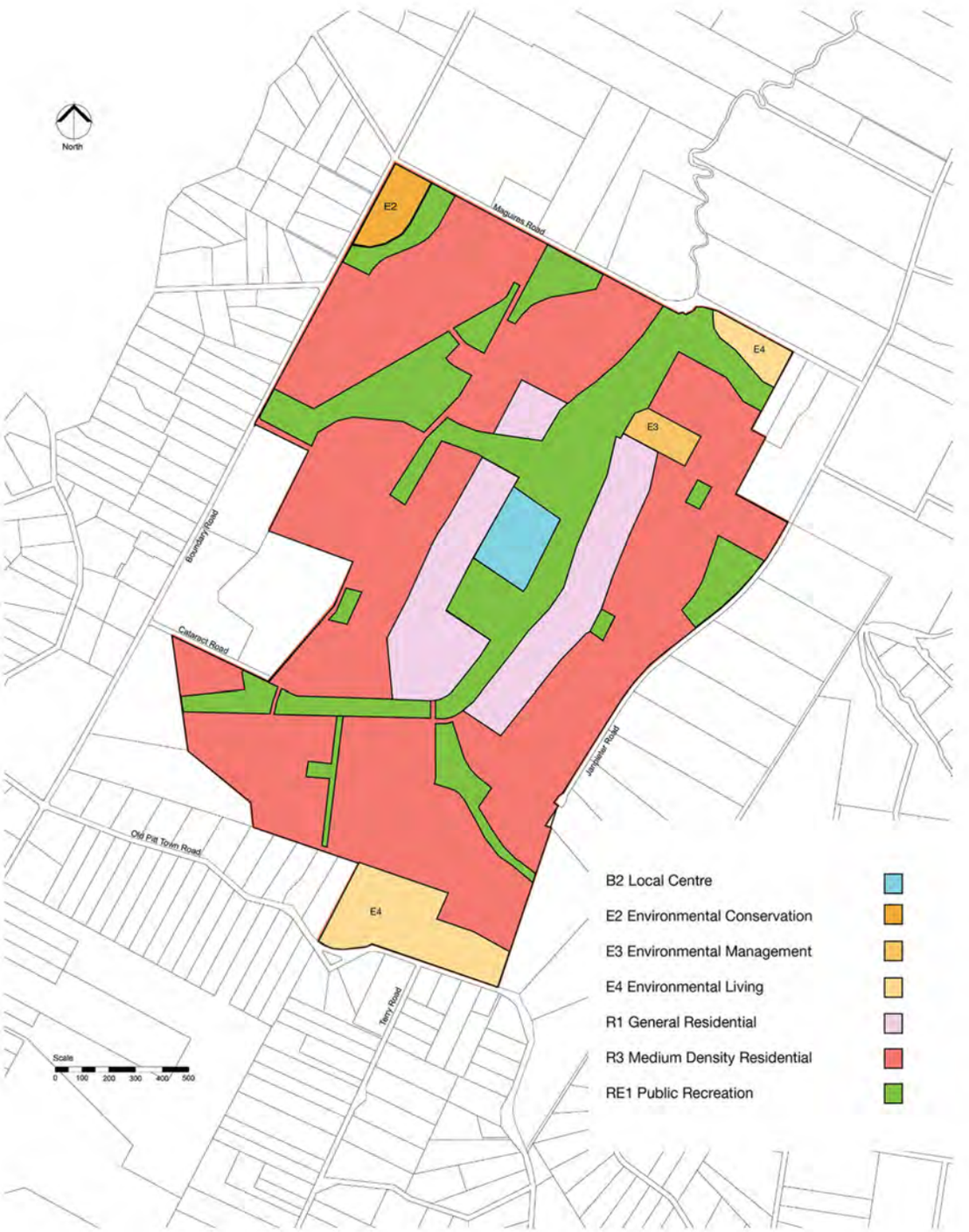


Figure 41. Draft Land Use Zoning Map

Table 8. Draft Land Zoning Table

Zone	Purpose (as per DoPI guidelines)	Proposed Land Uses
R1 General Residential	This zone is generally intended to provide for a variety of residential housing types and densities, including dwelling houses, multi-dwelling housing, residential flat buildings, boarding houses and seniors housing. The zone also provides for additional uses that provide facilities or services to residents, including neighbourhood shops and child care centres.	**1 Objectives of zone** • To provide for the housing needs of the community. • To provide for a variety of housing types and densities. • To enable other land uses that provide facilities or services to meet the day to day needs of residents. • To enable other land uses that support the adjoining or nearby commercial centres and protect the amenity of the adjoining or nearby residential areas. **2 Permitted without consent** Home businesses; Home occupations **3 Permitted with consent** Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Business premises; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Group homes; Home-based child care; Hostels; Hotel or motel accommodation; Multi dwelling housing; Neighbourhood shops; Office premises; Places of public worship; Residential flat buildings; Respite day care centres; Restaurants or cafes; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Any other development not specified in item 2 or 4 **4 Prohibited** Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Information and education facilities; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Resource recovery facilities; Restricted premises; Rural industries; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Waste disposal facilities; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies

Zone	Purpose (as per DoPI guidelines)	Proposed Land Uses
R3 Medium Density Residential	This zone is for land where a variety of medium density accommodation is to be established or maintained. Other residential uses (including typically higher or lower density uses) can also be permitted in the zone where appropriate. A variety of residential uses have been mandated to encourage housing choice and diversity in this zone	**1 Objectives of zone** • To provide for the housing needs of the community within a medium density residential environment. • To provide a variety of housing types within a medium density residential environment. • To enable other land uses that provide facilities or services to meet the day to day needs of residents. • To encourage medium density residential development in locations that are close to population centres and public transport routes. **2 Permitted without consent** Home businesses; Home occupations **3 Permitted with consent** Attached dwellings; Boarding houses; Building identification signs; Business identification signs; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Group homes; Home-based child care; Multi dwelling housing; Neighbourhood shops; Places of public worship; Respite day care centres; Roads; Seniors housing; Any other development not specified in item 2 or 4 **4 Prohibited** Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Information and education facilities; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Restricted premises; Rural industries; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies

Zone	Purpose (as per DoPI guidelines)	Proposed Land Uses
B2 Local Centre	This zone is generally intended for centres that provide a range of commercial, civic, cultural and residential uses that typically service a wider catchment than a neighbourhood centre. This zone provides for residential accommodation in the form of 'shop top housing,' and other uses such as 'educational establishments,' 'entertainment facilities,' 'function centres,' 'information and education facilities,' 'office premises,' and 'tourist and visitor accommodation.' Such a mix of uses will increase walking, cycling and public transport options for more people by making more activities available in one location. It is expected that this will be the most appropriate zone for most local and town centres across NSW.	**1 Objectives of zone** • To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area. • To encourage employment opportunities in accessible locations. • To maximise public transport patronage and encourage walking and cycling. **2 Permitted without consent** Home businesses; Home occupations **3 Permitted with consent** Attached dwellings; Boarding houses; Building identification signs; Business identification signs; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Home-based child care; Information and education facilities; Medical centres; Multi dwelling housing; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Residential flat buildings; Respite day care centres; Restricted premises; Roads; Service stations; Shop top housing; Tourist and visitor accommodation; Any other development not specified in item 2 or 4 **4 Prohibited** Agriculture; Air transport facilities; Animal boarding or training establishments; Boat building and repair facilities; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Environmental facilities; Exhibition homes; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Recreation facilities (major); Research stations; Residential accommodation; Resource recovery facilities; Rural industries; Sewerage systems; Sex services premises; Signage; Storage premises; Transport depots; Truck depots; Vehicle body repair workshops; Warehouse or distribution centres; Waste disposal facilities; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies

Zone	Purpose (as per DoPI guidelines)	Proposed Land Uses
RE1 Public recreation (local open space / regional open space etc)	This zone is generally intended for a wide range of public recreation areas and activities, including local and regional open space. Councils may generally permit typical public recreation uses in this zone. A range of land uses compatible with the recreation use of the land should be permitted. Land zoned RE1 Public Recreation must be included on the Land Reservation Acquisition Map.	**1 Objectives of zone** • To enable land to be used for public open space or recreational purposes. • To provide a range of recreational settings and activities and compatible land uses. • To protect and enhance the natural environment for recreational purposes. **2 Permitted without consent** Environmental protection works **3 Permitted with consent** Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Emergency service facilities; Environmental facilities; Information and education facilities; Kiosks; Markets; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Respite day care centres; Restaurants or cafes; Roads; Take away food and drink premises; Water recreation structures **4 Prohibited** Any development not specified in item 2 or 3

Zone	Purpose (as per DoPI guidelines)	Proposed Land Uses
E2 Environmental Conservation	This zone is generally intended to protect land that has high conservation values outside the national parks and nature reserve system. The use of this zone needs to be justified by appropriate evaluation of the area in terms of meeting the core zone objectives of having high ecological, scientific, cultural or aesthetic values.	**1 Objectives of zone** • To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values. • To prevent development that could destroy, damage or otherwise have an adverse effect on those values. **2 Permitted without consent** Nil **3 Permitted with consent** Environmental facilities; Environmental protection works; Research stations; Roads **4 Prohibited** Business premises; Hotel or motel accommodation; Industries; Multi dwelling housing; Recreation facilities (major); Residential flat buildings; Restricted premises; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3

Zone	Purpose (as per DoPI guidelines)	Proposed Land Uses
E3 Environmental Management	This zone is generally intended to be applied to land that has special ecological, scientific, cultural or aesthetic attributes, or land highly constrained by geotechnical or other hazards.	**1 Objectives of zone** • To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values. • To provide for a limited range of development that does not have an adverse effect on those values. • To provide for residential development on the land having regard to the geotechnical constraints of the land. **2 Permitted without consent** Home occupations **3 Permitted with consent** Dwelling houses; Environmental protection works; Roads **4 Prohibited** Industries; Multi dwelling housing; Residential flat buildings; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3

Zone	Purpose (as per DoPI guidelines)	Proposed Land Uses
E4 Environmental Living	This zone is for land with special environmental or scenic values, and accommodates low impact residential development.	**1 Objectives of zone** 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. **2 Permitted without consent** Home occupations **3 Permitted with consent** Bed and breakfast accommodation; Building identification signs; Business identification signs; Community facilities; Dual occupancies (attached); Dwelling houses; Emergency services facilities; Environmental protection works; Home-based child care; Home businesses; Roads; Secondary dwellings **4 Prohibited** Industries; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3

5.3. Explanation of land use zone selection

A fundamental objective for development within Box Hill North is to ensure that 4,100 dwellings are delivered upon. This will require the provision of a full range of housing types, including medium density dwellings and residential flat development. Delivery of higher density housing in conjunction with new local centres and transport networks and green space is a further fundamental objective for the development.

5.3.1. R1 General Residential Zone

It is proposed to apply the R1 General Residential Zone to land adjacent to the proposed town centre and central area of open space (i.e. generally within 200 m of the town centre) on the basis that this zone is broad based, allows for and encourages the provision of the most diverse range of housing, and allows for maximum flexibility for subdivision and development over time. Whilst the R1 General Residential zone also permits a range of non-residential uses, it is expected that the majority of non-residential uses will be accommodated within the proposed Town Centre (proposed to be zoned B2 Local Centre) in the central portion of the site. The zoning objectives for the R1 General Residential, in particular, relate to limiting other non-residential uses to facilities and services that meet the day to day needs of residents and other uses that 'support' the adjoining centre as opposed to 'compete' with the Town Centre.

5.3.2. R3 Medium Density Zone

It is proposed to apply the R3 Medium Density Zone to the majority of the remaining residential areas of the site, consistent with the application of the R3 Medium Density Zone within other parts of The Hills Local Government Area (LGA) (i.e. Rouse Hill, Beaumont Hills, Kellyville and Norwest) where a variety of medium density accommodation is proposed to be established and where other residential uses (including typically higher or lower density uses) and other land uses that provide facilities or services to meet the day to day needs of residents could also be permitted. As part of the LEP amendment, it is proposed to amend Schedule 1 - Development for Certain Additional Purposes of The Hills LEP 2012 –to enable the use of land proposed to be zoned R3 Medium Density within Box Hill North for 'residential flat buildings', 'secondary dwellings', 'semi-detached dwellings', 'shop top housing' and 'sewerage systems'. The proposed R3 Medium Density zone also allows for a limited amount of non-residential uses, to meet the day to day needs of residents. This is considered appropriate in that non-residential uses outside of a local centre can make improvements to the liveability of a neighbourhood (i.e. a local neighbourhood shop or café, or child care centre can become important meeting places for the local community).

Application of a R1 General Residential Zone and R3 Medium Density Zone with additional Schedule 1 permitted uses across the majority of the site with the accompanying development controls, is considered to be an appropriate outcome for the site and the project as a whole given that it is a major urban development project with an implementation time frame of 15+ years. The land use zone applied needs to be flexible and responsive to circumstances that may arise over time, and should be established in a manner that is permissive and facilitative without undue restriction and control. Alternatively, the application of an R1 General Residential zone across the majority of the site, as a single zone, would also reflect the intended outcome of the planning proposal and the site.

It is considered that the application of an R2 Low Density Zone or a mix of R2 Low Density, R3 Medium Density and R4 High Density is difficult at the planning proposal stage, is unnecessarily restrictive, does not provide sufficient flexibility to respond to changes in the market and housing needs over a 15+ year period and may not address design issues as they arise during the detailed design phase or provide sufficient market flexibility to encourage higher density housing more broadly throughout the site. The approach taken (i.e. application of an R1 General Residential zone and R3 Medium Density Zone with additional Schedule 1 permitted land uses) or single R1 General Residential zone, will minimise the need to undertake 'spot rezonings' or other ad hoc LEP amendments that were not anticipated during the initial ILP / LEP preparation.

5.3.3. B2 Local Centre Zone

It is proposed to apply the B2 Local Centre Zone to the Box Hill North Town Centre rather than the B1 Neighbourhood Centre or B4 Mixed use Zone on the basis that the B2 Local Centre Zone is considered to better reflect the intention of the Box Hill North Town Centre to provide a range of non-residential development as well as residential development. The ILP provides a local centre with capacity for up to 10,000m2 of non-residential floor space for retail, office and business uses. The intention to accommodate non-residential uses primarily in the Town Centre is proposed to be reinforced / strengthened through the site specific DCP prepared for Box Hill North.

As described in the DoPI's LEP Practice Note PN 06-002 the B2 Local Centre Zone is intended for centres that provide a range of retail, business, entertainment and community functions that typically service a wider catchment than a neighbourhood centre. The proposed local centre will primarily support the 4,100 dwellings to be accommodated within Box Hill North and expected residential population of 12,860 persons.

It is also considered that application of the B2 Local Centre Zone is consistent with DoPI's Promoting Economic Growth and Competition Through the Planning System Review Report (April 2010). The Review Report identifies that land use planning systems should be flexible and should ensure that land use planning policies provide for the growth of centres to be responsive as the population density in the area changes and consumer needs shift over time with changes in demographics. To have the best economic and innovative outcomes, the DoPI Review Report concludes that strategic planning documents need to reflect the dynamic nature of land use and in particular, that it is important that centres can accommodate a range of mixed uses.

Mixed use land included within the ILP within the future Town Centre is to be used for a wide range of retail, commercial, business, entertainment, civic, community, recreation, residential, tourist and visitor accommodation and mixed use employment. It is considered that the B2 Local Centre zone appropriately reflects this outcome.

5.3.4. RE1 Public Recreation

It is proposed to apply the RE1 Public Recreation zone to all riparian corridors (existing and proposed), parks and sporting fields within the site. This land is to be dedicated to Council.

It is also proposed to zone the existing patch of Shale Sandstone Transition Forest within the site's north-east corner to RE1 Public Recreation as opposed to an E2 Environmental Conservation zone or E3 Environmental Management zone. In terms of protecting this vegetation, under the Local Government Act 1993 Council must prepare and implement a Plan of Management for this land (i.e. land zoned RE1 Public Recreation). Chapter 6, Part 2, Division 2 of the LGA Act sets out a number of elements that must be addressed in a plan of management including requirements for land that includes endangered species and ecological communities. It is considered that applying an E2 Environmental Conservation Zone to this land would significantly limit opportunities for Council to enable the land to be used for public open space or recreational purposes. The uses that are permitted within an E2 Environmental Conservation zone are limited to environmental facilities and environmental protection works.

As part of the LEP amendment, it is proposed to amend Schedule 1 - Development for Certain Additional Purposes of The Hills LEP 2012 –to enable the use of land proposed to be zoned RE1 Public Recreation within Box Hill North for 'drainage'.

5.3.5. E2 Environmental Conservation

This zone is generally intended to protect land that has high conservation values outside the national parks and nature reserve system. It is proposed to apply the E2 Environmental

Conservation zone to the 4.8 hectare parcel of land within the north-west corner of the site which contains Cumberland Plain Woodland that is proposed to be retained and revegetated. The use of this zone has been justified by appropriate evaluation of this part of the site as having high ecological and aesthetic value. This is explained in detail and justified in section 8.1 of this Planning Proposal and in the Flora and Fauna Assessment prepared by Cumberland Ecology and included at **Appendix D**.

The conservation management measures proposed for the Cumberland Plain Woodland include managing the vegetation through a native regeneration program. This management program would continue through the life of the development, ensuring its long term and self sustaining conservation. For the benefit of the broader community and the protection of the bushland it is proposed to dedicate this land to Council at development completion.

5.3.6. E3 Environmental Management

It is proposed to apply the E3 Environmental Management Zone to a 3.2 hectare area of land within the north-east corner of the site. The proposed alignment of this parcel of E3 zoned land generally corresponds to Shale Sandstone Transition Forest that has been identified in the flora and fauna assessment as being in poor condition. This is explained in detail and justified in section 8 of this planning proposal and in the Flora and Fauna Assessment prepared by Cumberland Ecology and included at **Appendix D**. The E3 Environmental Management is proposed on the basis that it will act as a transition between areas of Shale Sandstone Transition Forest that are in better condition and proposed to be retained in an RE1 Public Recreation zone and the more intensive R3 Medium Density zoned land. Within the E3 Environmental Management zone under The Hills LEP 2012, 'dwelling houses' are permissible with development consent.

5.3.7. E4 Environmental Living

It is proposed to apply the E4 Environmental Living Zone to the areas of lower density residential development within the north-east and south-east portions of the site in lieu of a R5 Large Lot Residential Zone under The Hills LEP 2012.

As described in the DoPI's LEP Practice Note PN 06-002 the E4 Environmental Living Zone is intended for land with special environmental or scenic values where residential development could be accommodated. The DoPI's LEP Practice Note PN 09-002 further identifies that the E4 Environmental Living Zone:

"is for land with special environmental or scenic values, and accommodates low impact residential development..... This zone will be typically applied to existing low impact residential development. This may include areas already zoned for rural residential that have special conservation values.....where environmental capabilities are the primary concern on land that may be zoned R5 Large Lot Residential, RU4 Rural Small Holdings or E4 Environmental Living, preference should be given to the E4 zone."

By contrast, the R5 Large Lot Residential Zone is intended to:

"cater for development that provides for residential housing in a rural setting. The allocation of large lot 'rural' residential land must be justified by a strategy prepared in accordance with guidelines issued by the Department. This zone was formerly known as a Rural Residential zone."

The areas of land proposed to be zoned E4 Environmental Living will support larger lot, low density residential development. It is considered that the E4 Environmental Living zone better reflects the nature of development proposed in these zones than does the R5 Large Lot Residential Zone, particularly given the context within the wider Box Hill and Box Hill North urban development precinct. Furthermore, the provision of R5 Large Lot Residential is not justified by a

land use strategy.

5.3.8. SP2 Infrastructure Zone

It is not proposed to apply the SP2 Infrastructure land use zone to any land that may be required for public infrastructure. This approach is consistent with the DoPI's LEP Practice Note PN 08-002 which advocates a zoning approach that provides greater flexibility and adaptive management of government land. The approach moves away from zoning public infrastructure land as 'special use' or 'special purpose' zones, which limits the ability of infrastructure providers to respond to changing demographic trends and provide the public with infrastructure and services outside of nominated locations.

5.4. Principal Development Standards

It is intended that the LEP Amendment will contain principal development standards for:

- minimum lot sizes for residential development in the R1 General Residential, R3 Medium Density, E3 Environmental Management and E4 Environmental Living land use zones; and
- maximum height of buildings in the R1 General Residential, R3 Medium Density, E3 Environmental Management, E4 Environmental Living and B2 Local Centre land zones.

A draft Minimum Lot Size Map and draft Height of Buildings Map are included at Figures 42 and 43.

5.5. Minimum subdivision lot sizes

It is not proposed to adopt the minimum lot sizes for dual occupancy, multi dwelling housing and residential flat buildings or the exceptions to minimum lot sizes for certain residential development as set out in clauses 4.1A and 4.1B of The Hills LEP 2012, respectively.

For the purposes of subdivision in Box Hill North, the draft Minimum Lot Size Map establishes minimum lot sizes of:

- 125 m2 in the R1 General Residential Zone and R3 Medium Density Zone; and
- 2,000m2 on land within the E3 Environmental Management and E4 Environmental Living Zone.

To facilitate and encourage the provision of a range of dwelling types within the R1 General Residential and R3 Medium Density zone, it is proposed to establish minimum lot sizes for certain types of residential development in accordance with Table 9:

Table 9. Minimum lot sizes

Dwelling Type	Minimum allotment size
Dwelling houses	200m2
Semi-detached dwellings	200m2
Dual occupancy	500m2
Secondary dwellings	250m2
Attached dwellings	125m2
Multi-dwelling housing	1,500m2
Residential Flat Buildings	1,500m2

It is proposed that the LEP Amendment include a special provision to this effect as follows:

4.1D Minimum allotment sizes for residential development in Box Hill North

(1) The objectives of this clause are as follows:

(a) to establish minimum allotment sizes for residential development in Box Hill North,

(b) to ensure that residential development has adequate usable areas for buildings and open space, and

(c) to facilitate and encourage the provision of a range of dwelling types.

(2) The minimum allotment size for certain residential development is set out in the table below.

Dwelling type	*Minimum allotment size*
Dwelling houses	*200m2*
Semi-detached dwellings	*200m2*
Dual occupancy	*500m2*
Secondary dwellings	*250m2*
Attached dwellings	*125m2*
Multi dwelling housing	*1,500m2*
Residential flat buildings	*1,500m2*

The proposal to establish minimum lot sizes for different types of residential dwellings within the broader residential zone is consistent with the minimum lot size controls established for Box Hill and North Kellyville Precinct Plans.

The draft Minimum Lot Size Map has adopted the 125 m2 minimum lot size for attached dwellings, being the smallest Torrens Title lot size proposed within the zone. No minimum lot size is proposed for the B2 Local Centre zone.

5.5.1. Integrated Housing

The objective of clause 4.1B of The Hills LEP 2012 is to ensure that the development of dwellings on small lots is managed in order to achieve reasonable levels of residential amenity and relevantly states

4.1B Exceptions to minimum lot sizes for certain residential development

(1) The objective of this clause is to encourage housing diversity without adversely impacting on residential amenity.

(2) This clause applies to development on land in the following zones:

(a) Zone R3 Medium Density Residential,

(b) Zone R4 High Density Residential.

(3) Development consent may be granted to a single development application for development to which this clause applies that is both of the following:

(a) the subdivision of land into 3 or more lots,

(b) the erection of an attached dwelling or a dwelling house on each lot resulting from the subdivision, if the size of each lot is equal to or greater than:

(i) for the erection of a dwelling house—240 square metres, or

(ii) for the erection of an attached dwelling—240 square metres.

As discussed above, it is not proposed to apply clause 4.1B to development within Box Hill North on the basis that it:

- discourages the development of smaller lot housing by increasing the time and risk in the planning and approval process. It is easier, more time efficient, less risky and more cost effective to simply subdivide all lots to the minimum permissible lot size;

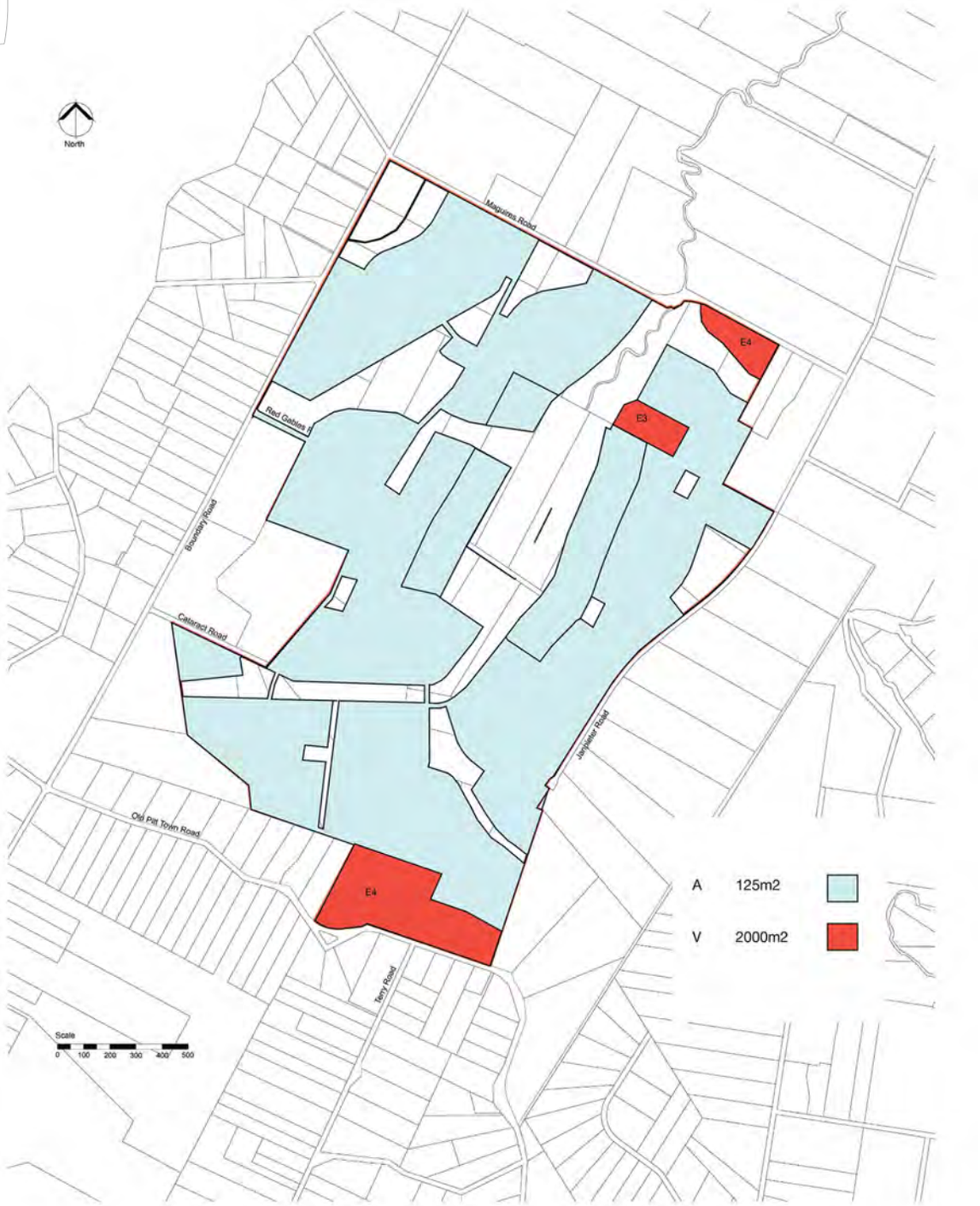


Figure 42. Draft Minimum Lot Size Map

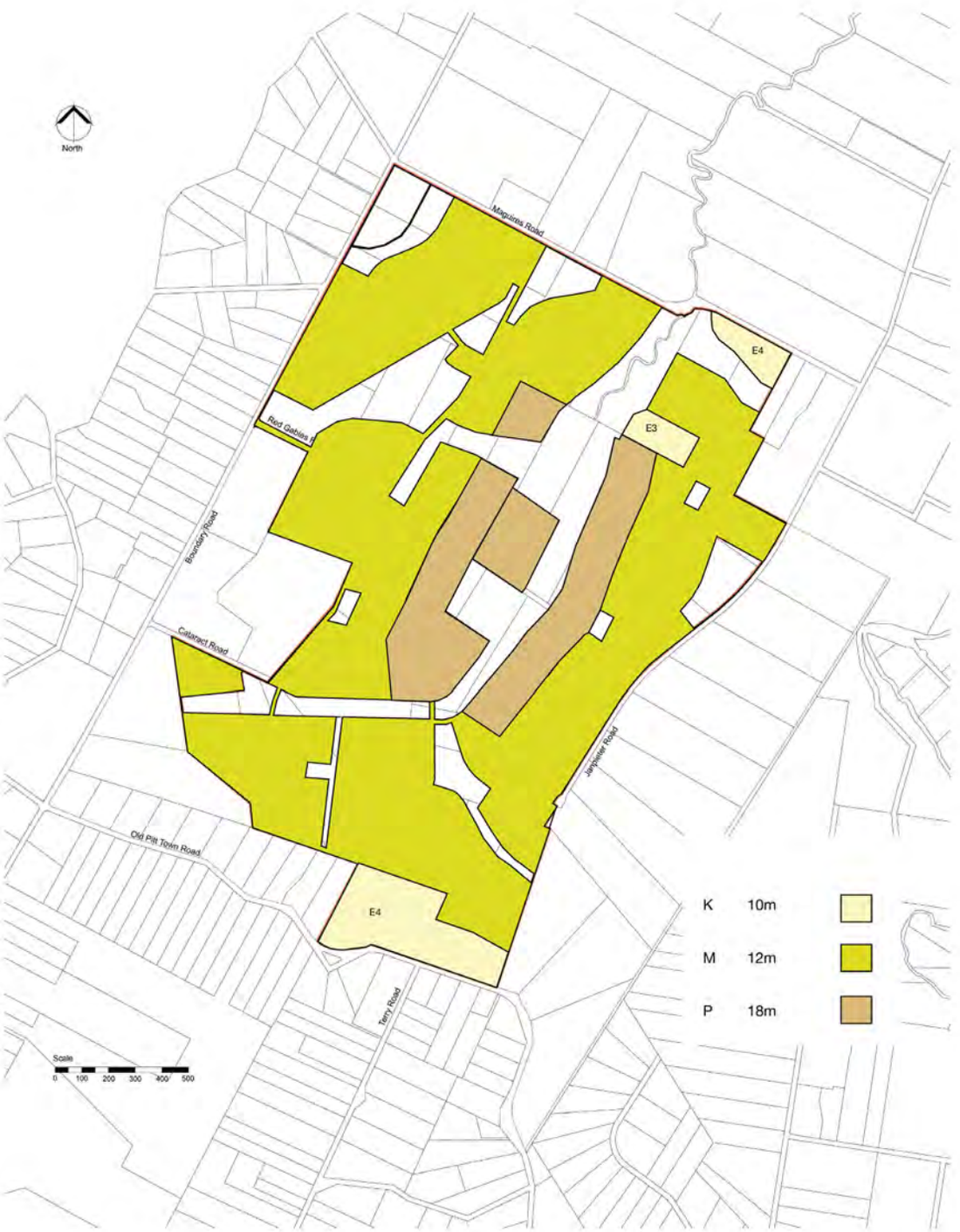


Figure 43. Draft Building Heights Map

- reduces the affordability of small lot housing as the increased holding and development costs are generally passed onto the potential purchaser; and
- can contribute to the dominance of large single detached homes being constructed in accordance with minimum lot sizes rather than promoting a mix of dwelling types that meet the housing needs of a diverse community.

The design of small lot housing is proposed to be controlled through the Draft Development Control Plan for Box Hill North. The Draft Development Control Plan contains specific controls in relation to small lot housing to ensure that reasonable levels of residential amenity and solar access are achieved (refer to **Appendix K**).

5.5.2. Maximum Height of Buildings

Currently, a maximum building height of 10 metres applies across the site. The maximum height proposed for the R1 General Residential, R3 Medium Density, E3 Environmental Management, E4 Environmental Living and B2 Local Centre land use zones is summarised in Table 10.

Table 10. Proposed maximum building heights

Zone	Maximum Height (m)
R1 General Residential	18 m
R3 Medium Density	12 m
E3 Environmental Management	10 m
E4 Environmental Living	10 m
B2 Local Centre	18 m

Within the R1 General Residential and B2 Local Centre Zone, a general maximum building height of 18 m is proposed. It is intended that the town centre will comprise predominantly up to 5 storey buildings in the centre, with lower buildings or set down edges to the street of 3-4 storeys. Within the R3 Medium Density zone, a general maximum height of 12 m is proposed, consistent with the heights prescribed in The Hills LEP 2012 on other land zoned R3 Medium Density (i.e. Rouse Hill, Beaumont Hills, Kellyville and Norwest). This will allow for buildings of 2 - 4 storeys. It is not anticipated to develop to the maximum height for the entire area, it does allow for architectural design elements within the dwelling treatments and taller building forms in areas with high visual or landscape amenity and proximity to facilities.

5.5.3. Minimum Residential Density

It is not proposed to apply a minimum residential density standard to Box Hill North on the basis that the existing The Hills LEP 2012 does not apply a minimum residential density development standard for any land to which the LEP applies. It is also considered that minimum residential density development standard are unnecessarily complicated and restrictive and unlike circumstances in which the development of fragmented land holdings in multiple ownership may make achieving certainty in delivery of minimum density problematic, in this case the majority of the site is in single ownership and / or control.

5.5.4. Floor Space Ratio

It is not proposed to set a maximum FSR for any building on any land within the Box Hill North site. FSR controls are effective development controls for high density development in urban areas. Medium and low rise residential development requires a combination of controls to achieve public and private domain outcomes, and different housing types need quite different FSRs. A better alternative to appropriately deal with a range of dwelling types is use of building footprint limits, minimum landscaped area, solar access controls and minimum rear boundary setbacks. These matters are appropriately dealt with in the Draft Development Control Plan for Box Hill North.

5.6. Land Reservation and Acquisition

The proposed LEP Amendment proposes to reserve land exclusively for a public purpose. Land to be included on the Council's existing Land Reservation Acquisition Map and section 5.1 of the Hills LEP 2012 includes:

- all land zoned RE1 Public Recreation (to be dedicated to Council); and
- 2.2 hectare portion of the site that comprises the school site (to be dedicated to the Department of Education and Communities).

The conservation management measures proposed for the Cumberland Plain Woodland include managing the vegetation through a native regeneration program. This management program would continue through the life of the development, ensuring its long term and self sustaining conservation. For the benefit of the broader community and the protection of the bushland it is proposed to dedicate this land to Council at development completion.

5.7. Development Control

A site specific Development Control Plan for Box Hill North is included as part of the Planning Proposal (refer to **Appendix K**). It is intended that the Development Control Plan for Box Hill North will guide the assessment of future detailed subdivision and built form proposals. In the event of any inconsistency between the site specific section of the DCP that relates to Box Hill North and any other sections of Council's DCP, the provisions of the site specific DCP shall prevail only to the extent of the inconsistency.

SECTION 6.

Development Contributions

6. Development Contributions

6.1. State Development Contributions

The site is not subject to the Special Infrastructure Contribution (SIC) that applies to development in the North West and South West Growth Centres. The Special Infrastructure Contribution (SIC) is a contribution towards the funding of a range of regional infrastructure and services that have been identified as being required as a result of the development within the Growth Centres. The SIC will provide a source of funding towards:

- New and upgraded regional roads;
- New and upgraded heavy rail;
- Bus services;
- Educational services;
- Health services;
- Emergency services;
- Attorney General's services;
- Provision of conservation lands; and
- Precinct planning and delivery.

6.2. Local Development Contributions

6.2.1. Existing local contributions regime

Currently, the site is subject to The Hills Section 94A Contributions Plan (the s.94A Plan). The Hills Section 94A Contributions Plan authorises Council to impose a condition of development consent or a complying development certificate to require the payment of a fixed levy. The quantity of the levy and the types of development application which attract the levy are set out below:

Proposed cost of the development	Maximum percentage of the levy
Up to $100,000	Nil
$100,001 - $200,000	0.5%
More than $200,000	1%

Under the s.94A Plan, Council is levying contributions for the provision of the following types of facilities:

- Open Space (land and works);
- Drainage (works);
- Community facilities (works); and
- Roads and Traffic (works).

The existing s.94A Plan does not contemplate future population growth associated with Box Hill North and cannot reasonably be applied.

6.2.2. Draft Contributions Plan No.15 Box Hill Precinct

As part of the recent Box Hill and Box Hill Industrial Precinct rezoning, Council prepared a draft Section 94 Contributions Plan. Under this plan, Council is levying contributions for the provision of the following types of facilities:

- Open space (land and works);
- Transport (land and works);
- Water Management (land and works); and
- Administration.

Contributions under Draft Contributions Plan No.15 Box Hill Precinct are proposed to be based on a per hectare rate as set out in Table 11 (as at March 2013):

Table 11. Proposed contribution rate per hectare

Facility Type	Unit	$ Rate per Hectare
Open Space Land	Net Developable Area	$210,311.54
Open Space Capital	Net Developable Area	$112,887.59
Transport - Land	Net Developable Area	$21,378.24
Transport Capital	Net Developable Area	$192,237.29
Water Management Land (SPC)*	Net Developable Area	$25,803.37
Water Management Capital (SPC)	Net Developable Area	$30,792.80
Administration	Net Developable Area	$19,498.86
Water Management Land (KCP)**	Net Developable Area	$89,057.09
Water Management Capital (KCP)	Net Developable Area	$207,368.69
Total		**$909,335.49**

* Second Ponds Creek Catchment

** Killarney Chain of Ponds Catchment

6.2.3. Proposed local contributions

EJC intend to meet its obligations with respect to local development contributions via a combination of carrying out of works in kind, dedication of land and provision of material public benefits. This planning proposal is accompanied by an offer to enter into a Voluntary Planning Agreement with Council and State Government for the delivery of infrastructure that are required to meet the future demands of Box Hill North. This includes road network improvements, district and local open space and a community facility.

6.2.4. Section 94 Plan for Box Hill North

As the study area to be rezoned contains 5 properties, approximately 50 hectares, a Section 94 Contributions Plan will be required for Box Hill North. This plan is envisaged to be similar to Box Hill.

SECTION 7.

Strategic Justification

7. Strategic Justification

The relationship of the Planning Proposal to the Metropolitan Strategy and Draft North-West Subregional Strategy has been considered. The following section provides evidence that the Planning Proposal is consistent with housing and employment targets, outcomes and actions set out in both of these strategic planning documents. The Planning Proposal's consistency with State Environmental Planning Policies and Section 117 Directions is also examined.

7.1. Metropolitan Plan for Sydney 2036

The Metropolitan Plan predicts that Sydney will grow to a population of approximately 6 million people by 2036. To accommodate this growth, it is anticipated that there will be a need for an additional 770,000 dwellings, 10 million square metres of commercial floor space and 5 million square metres of additional retail floor space. Approximately 760,000 more jobs are targeted to be created in this period.

The primary objective of the Metropolitan Plan for Sydney is to ensure that there is an adequate supply of land to enable the delivery of residential development to accommodate the forecast population growth. The strategy seeks to encourage the provision of housing near jobs, transport and services, to improve housing affordability, upgrade the quality of new development and encourage urban renewal. The Metropolitan Plan provides updated subregional housing targets and a new timeframe to 2036. For the North-West, the new dwelling target is 169,000 new dwellings. Of the 169,000 new dwellings, 83,000 are anticipated to be accommodated in new release areas (Growth Centres and other Greenfield releases in the subregion). The proposed rezoning of Box Hill North will deliver 4,100 new dwellings within close proximity to a town centre and supporting services and facilities and will go some way in contributing to the balance of dwellings to be accommodated within the subregion. As demonstrated throughout this planning proposal, the Box Hill North site is capable of speedy and well planned development with the first lots ready to be taken up in 2016. A mix of housing types that range from small lot, medium and high density to large lot residential dwellings are to be provided within Box Hill North to facilitate housing diversity and choice and meet the requirements of people with different housing needs, consistent with the Metropolitan Plan which calls for more low rise medium density housing in and around smaller local centres. Generally, higher residential densities (small lot, medium and high density) are to be located in the vicinity of the town centre and in areas with high visual or landscape amenity and proximity to facilities. Approximately 80% of all new dwellings are within walking distance of the proposed town centre and 90% within 400 m of a proposed bus stop. The range of densities proposed will enable a range of dwelling types, allow for social and demographic diversity and provide a proportion of dwellings at affordable price points.

7.2. Metropolitan Strategy - City of Cities: A Plan for Sydney's Future (2005)

The NSW Government's Metropolitan Strategy - City of Cities: A Plan for Sydney's Future (2005) (Metropolitan Strategy) outlined the strategic direction for the Sydney region over the next 25 years and included actions specific to the North West Growth Centre. The Metropolitan Strategy outlined five aims to achieve a more sustainable city which include:

- enhance liveability,
- strengthen economic competitiveness,

- ensure fairness,
- protect the environment, and
- improve governance.

The Metropolitan Strategy anticipated that Sydney's population was to grow by 1.1 million people from a population of 4.2 million to 5.3 million by 2031. This population growth would require the following:

- 640,000 new homes;
- 500,000 more jobs over the next 25 to 30 years;
- 7,500 hectares of extra industrial land if current trends continue;
- 6.8 million square metres of additional commercial floor space; and
- 3.7 million square metres of additional retail space.

As discussed above, the proposed rezoning of Box Hill North will deliver 4,100 new dwellings within close proximity to a 5.5 hectare Town Centre and supporting services and facilities and will go some way in contributing to the balance of dwellings to be accommodated within the subregion.

7.3. Metropolitan Transport Plan – Connecting the City of Cities (2010)

The Metropolitan Transport Plan (2010) outlines a 25 year vision for land use planning in Sydney together with a ten year fully funded package of transport infrastructure to support it. The vision of the Metropolitan Transport Plan is to meet Sydney's expected population and employment growth over the next 10 years. Of particular relevance to the North West Growth Centre and Box Hill North are the North West Rail Link (NWRL) and the improvements to bus corridors including the transit way from Parramatta to Rouse Hill. In addition, the principle of getting Sydney moving through creating an active lifestyle will be supported in the precinct planning process through the provision of walking and cycling infrastructure.

7.4. Draft North West Subregional Strategy

Subregional strategies have been adopted to translate objectives of the Metropolitan Strategy and State Plan to the local level. The draft North West Subregional Strategy prepared in December 2007 is the subregional strategy relevant to precinct planning for the Precincts and aims to guide land use planning until 2031.

The Hills Local Government Area (LGA) has a population of 170,000 people (2011) and covers an area of 400 km^2. Population growth in recent years has been among the highest in the Sydney Region. This has been influenced by major land release focussed around Kellyville and Rouse Hill. Housing in the subregion is mainly low density detached dwellings. Employment within the LGA is focussed at Castle Hill, Annangrove, Dural, North Rocks, Northmead, Rouse Hill, Winston Hills and Kellyville as well as Norwest, Marsden Park and Box Hill.

7.4.1. Housing

The Draft Strategy expects that an additional 140,000 new dwellings will be needed in the North-West Subregion by 2031 to accommodate anticipated population growth. Of these, 21,500 are targeted to be located within The Hills LGA. There are a number of factors that will promote or hinder the achievement of these housing targets, such as the ability to meet infrastructure demands, fragmented land ownership and need for site amalgamation, delivery of a variety of housing types to meet market demands and the availability and suitability of greenfield sites to accommodate urban development. Greenfield sites such as Box Hill North that are not constrained by infrastructure and can be serviced efficiently and in a timely manner, are in single ownership or control, and are able to deliver a diversity of housing will play a key role in achieving the North-West Subregional housing targets.

Providing approximately 4,100 dwellings as part of the development of the site is aligned with State Government objectives of meeting population and housing growth targets in Sydney. The outstanding location and amenity of the site lends itself to residential development.

7.4.2. Employment

The Draft Strategy projects an increase of 367,000 jobs in the North West Subregion by 2031. Of these, it is anticipated that 100,000 jobs will be provided locally in The Hills LGA. Box Hill North provides for a new Town Centre with capacity for up to 10,000 m2 of commercial floor space for retail, office and business uses. This amount of non-residential floor space provides for the retail and business services to meet the needs of future residents in Box Hill North. It also provides the opportunity for employment generation in retail and office uses in the Town Centre. The site is to the immediate north of planned major employment lands within the Box Hill and Box Hill Industrial Precinct (approximately 133 hectares).

7.5. North West Sector Bus Servicing Plan

In October 2009, the North West Sector Bus Servicing Plan was released which defines the future long-term bus service needs for the North West Sector. The North West Sector Bus Servicing Plan includes a combination of:

- Regional bus routes – higher frequency services (every 15 minutes during weekday peaks and every 30 minutes off-peak) that run into the evening (hourly) and ensure 90 per cent of residents are within 800 metres of a service; and
- District bus routes – less frequent services (every 30 minutes during weekday peaks and every 60 minutes off-peak) that do not run into the evening. These routes should ensure that 90 per cent of residents are within 400 metres of a service.

The proposed bus network indicates two proposed new routes in the vicinity of Box Hill North:

- Route D2: Rouse Hill – Withers Road – Box Hill
- Route D3: Rouse Hill – Box Hill – Riverstone.

It is anticipated that the routes outlined in the 2009 North West Sector Bus Servicing Plan would be revised with the introduction of passenger rail services at Cudgegong Road station as part of the North West Rail Link. As discussed in section 4.3.2, the proposed bus networks could easily be extended to serve Box Hill North and ensure that more than 90 per cent of residents are within the service catchment.

7.6. Draft Local Strategy – New Strategic Direction for Baulkham Hills Shire

The Draft Local Strategy was adopted by Council on 10 June 2008. This land use planning document aims to guide planning up to 2031 and reflects the five key themes of the Hills 2026 Community Strategic Direction: Looking Towards the Future:

- resilient local leadership;
- vibrant communities;
- balanced urban growth;
- protected environment; and
- modern local economy.

The proposal is consistent with Draft Local Strategy – New Strategic Direction for Baulkham Hills Shire in that it:

- makes provision for a 5.5 hectare town centre in the central portion of the site that will serve the needs of the future Box Hill North local community. The town centre is generally within 500-600 m walking distance from 85% of residents. The town centre will include up to 10,000m2 of retail, restaurant and commercial uses;
- encourages the use of public transport throughout the site. Proposed bus networks can easily be extended to serve Box Hill North and ensure that more than 90 per cent of residents are within the service catchment. The proposal also provides bus stops at key locations and provision of pedestrian and cycle paths throughout the site;
- provides a network of public open space and a passive recreation includes shared paths, seating, small playgrounds and the like, located in proximity to residential areas. The opportunities exists to provide for a range of recreation from sporting fields, local parks and riparian corridors, connected by cycle and pedestrian pathways;
- creates a series of public spaces for people adjacent to the town centre and throughout the site;
- facilitates sustainable economic development by providing a town centre that accommodates up to 10,000m2 of retail and commercial floor space that is within 500-600 m walking distance of approximately 85% of the site. It is anticipated that the redevelopment of Box Hill North will provide employment opportunities in addition to the number of jobs created throughout its 15 + year roll out. Box Hill North will contribute to the planned employment area in Box Hill Industrial, to the south-east;
- creates a vibrant town centre that will add to the existing centres within the LGA. It is expected that the town centre will be developed as part of the early stages of the project;
- accommodates 4,100 dwellings and will support an expected population of some 12,860 persons. Location of smaller lot housing and residential flat buildings in proximity to town centre and areas of high amenity, responds to a recognised need by Council for a mix of smaller lot housing to respond to decline in household size, increase in aging population and issue of housing affordability within the LGA;
- provides larger lots within the southern and north-east corners of the site, providing an appropriate transition between existing large lot residential development and medium density development on the site, and ensuring there is minimal impact on the scenic landscape of Box Hill North;
- proposes a conservation strategy that will retain approximately 5.8 hectares of Cumberland Plain Woodland within the north-western corner of the site and 12 hectares of Shale Sandstone Transition Forest within the north-eastern portion of the site; and
- proposes an effective stormwater system that will manage and protect natural waterways including Cataract Creek.

7.7. State Environmental Planning Policies

State Environmental Planning Policies (SEPP) relevant to the planning proposal are

- SEPP No.55 – Remediation of Land; and
- SEPP No.65 – Design Quality of Residential Flat Development.

7.7.1. SEPP No. 55 – Remediation of Land

A Preliminary Site Investigation (PSI) has been prepared by JBS Environmental and is included at **Appendix B**. Based on the results of the PSI investigation as outlined in section 8, there is potential for subsurface contamination to be present on the site as a result of current and previous site usage (i.e. agriculture). Based on the site observations and agriculturally related site activities, it is considered that the potential for widespread contamination across the site is low, with the possible exception of asbestos.

Dangerous goods (petrol/diesel and chemical storage) are also likely to be present through-out the site, typical of rural / agricultural uses. It is considered unlikely that the areas of environmental

concern identified will have impacted the site to a degree that would prevent planning and development of the land for the intended use(s). The PSI report recommends that a Detailed Site Investigation (DSI) be completed to assess the extent of contamination prior to future detailed development. It is also recommended that, based on the age of the structures identified onsite, and the presence of suspected asbestos containing material, a hazardous materials building inspection be conducted for all structures located on the site to enable appropriate management during future development.

7.7.2. SEPP No.65 – Design Quality of Residential Flat Development

SEPP 65 applies to all new residential flat buildings across the State. The planning proposal envisages the site would accommodate residential flat buildings. The detailed design of future residential flat buildings will be subject to the provisions of SEPP 65 and the Residential Flat Design Code (RFDC) as part of the development application process. The ILP presented in the planning proposal and Draft Development Control Plan included at **Appendix K** has had regard to the rules of thumb set out in the RFDC.

7.8. Section 117 Direction

The following section 117 Directions are relevant to the Planning Proposal:

Direction 1.1: Business and Industrial Zones

The objectives of this direction are to:

a) encourage employment growth in suitable locations,

b) protect employment land in business and industrial zones, and

c) support the viability of identified strategic centres.

The Planning Proposal delivers employment land in both retail and business sectors to the site, thereby encouraging employment growth in Box Hill North and in The Hills Shire as a whole. The Planning Proposal is consistent with employment targets identified under the Draft Strategy and provides a suitable balance of retail and business zoned land within the site.

Direction 2.1: Environment Protection Zones

The objective of this direction is to protect and conserve environmentally sensitive areas.

The Planning Proposal has identified opportunities and constraints to development and identified the environmental assets of the site. The Planning Proposal includes a zoning scheme that responds to these factors.

Direction 3.1: Residential Zones

The objectives of this direction area:

a) to encourage a variety and choice of housing types to provide for existing and future housing needs,

b) to make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and

c) to minimise the impact of residential development on the environment and resource lands.

The Planning Proposal will deliver a range of densities, lot sizes and dwelling types and create a diverse community that is demographically balanced. The variety of housing forms will provide opportunities to respond to changing life cycle, lifestyle and work requirements over time, enabling people to age in place. As demonstrated in section 8, the proposal does not result in any significant adverse environmental impacts.

Direction 3.3: Home Occupations

The objective of this direction is to encourage the carrying out of low-impact small businesses in dwelling houses.

'Home occupations' are permissible without consent in the R1 General, R3 Medium Density, B2 Local Centre, E3 Environmental Management and Environmental Living zones, in accordance with The Hills LEP 2012. The Planning Proposal does not propose to amend the land use tables in respect of 'home occupations'.

Direction 3.4: Integrating Land Use and Transport

The objective of this direction is to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:

a) improving access to housing, jobs and services by walking, cycling and public transport, and

b) increasing the choice of available transport and reducing dependence on cars, and

c) reducing travel demand including the number of trips generated by development and the distances travelled, especially by car, and

d) supporting the efficient and viable operation of public transport services, and

e) providing for the efficient movement of freight.

The Planning Proposal is consistent with relevant guidance documents in that the site is suitably serviced by existing and planned future road infrastructure and transport services. It is expected that future capital works for road improvements within the vicinity of the site (i.e. new / upgrades to intersections, localised widening and turning bays, extension of right-turn-bays, road upgrades and traffic management) will arise as a result of redevelopment of the site. These costs will be borne by EJC.

Given that the Planning Proposal incorporates a variety of land uses ranging from residential to business, this variety in land use zones is expected to facilitate a self-contained suburb that could lead to residents living alongside to where they work, shop and play. This scenario would potentially reduce trips generated outside the site as residents could work and/or shop locally and therefore not significantly overload existing road infrastructure and public transport services. Further, the site could encourage future residents to utilise walking and cycling modes of transport to access their workplaces and/or community or retail uses from their residences within the site, recreation facilities in the locality or to use public transport links. Design of streets and cycleways will be subject of a future subdivision application which will be prepared in accordance with *Improving Transport Choice – Guidelines for planning and development* (DUAP 2001).

Direction 4.4: Planning for Bushfire Protection

The objectives of this direction are:

a) to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and

b) to encourage sound management of bush fire prone areas.

The site is located in close proximity to areas that are identified as bush fire prone land. As such, future investigation and structure planning of the site will consider these bush fire prone areas and identify measures for development to achieve compliance with the NSW Rural Fire Service guidelines on *Planning for Bushfire Protection 2006* and including the provision of Asset Protection Zones. Future development controls will include appropriate building design specifications and nomination of suitable building materials to address bushfire safety considerations. Site specific investigations will be undertaken as part of the post Gateway investigations.

Direction 6.2: Reserving Land for Public Purposes

The objectives of this direction are:

a) to facilitate the provision of public services and facilities by reserving land for public purposes, and

b) to facilitate the removal of reservations of land for public purposes where the land is no longer required for acquisition.

The proposed LEP Amendment proposes to reserve land exclusively for a public purpose, consistent with this direction (refer to section 5.6).

Direction 6.3: Site Specific Provisions

The objective of this direction is to discourage unnecessarily restrictive site specific planning controls.

The Planning Proposal adopts land use zones and uses drawn from The Hills LEP 2012 and specifies permissible and prohibited uses which represent as far as practical a role over of the current planning controls. It also makes provision to accommodate additional permitted residential uses on the site consistent with this Direction.

Direction 7.1: Implementation of the Metropolitan Plan for Sydney 2036

The objective of this direction is to give legal effect to the vision, transport and land use strategy, policies, outcomes and actions contained in the Metropolitan Plan for Sydney 2036.

As previously demonstrated, the Planning Proposal is consistent with the vision, transport and land use strategy, polices, outcomes and actions contained in the Metropolitan Plan for Sydney 2036.

SECTION 8.

Environmental, Social and Economic Impact

8. Environmental, Social and Economic Impact

This section addresses the environmental assessment of the Planning Proposal in respect to the relevant matters for consideration under Section 55(1) of the EP&A Act. The environmental assessment draws upon the site analysis, which justifies the configuration of the proposed development and the land use zones proposed. The following factors have been considered in this section:

- Flora and fauna;
- Transport and Access assessment;
- Water cycle management including flooding, surface water, groundwater quality and riparian corridors;
- Services and Utilities;
- Geotechnical, soils and contamination assessment;
- Aboriginal heritage assessment;
- Social planning assessment;
- Bushfire risk assessment;
- Retail analysis; and
- European heritage.

8.1. Flora and Fauna

A Flora and Fauna Assessment prepared by Cumberland Ecology is included at **Appendix D**. The flora and fauna assessment provides a strategic biodiversity assessment including:

- an analysis of ecological values and identification and mapping of areas of high, moderate and low ecological value (CPW and SSTF) on the site;
- addresses the impact of the ILP and planning proposal on existing native flora and fauna and their habitats, including identified threatened species and ecological communities; and
- provides an overview of the preferred conservation strategy for the site and how the environmental land offsets scheme will mitigate the impacts of the development.

Existing vegetation communities and their conservation status, threatened species and populations are detailed in the Site Analysis at section 2.

8.1.1. Opportunities

An options assessment has been undertaken in considering the conservation strategy for the Cumberland Plain Woodland and Shale Sandstone Transition Forest on the site. The analysis has involved balancing good urban design outcomes for a sustainable and cohesive community and adopting a 'maintain or improve' approach for these ecological communities. As discussed in section 3.4, the proposal has sought options for rezoning that aim in the first instance to maximise the in-situ retention of biodiversity values as far as practicable, particularly the CPW and SSTF patches identified in the NGH assessment.

Retention of Cumberland Plain Woodland

The CPW on the subject site is young, highly modified and surrounded largely by exotic grassland. The largest patch (i.e. Patch 4) is bisected by an existing house and tennis court. Notwithstanding the above, a small drainage line flows through the western corner of Patch 4 and into Patch 1. Since the more intact vegetation within Patch 4 occurs along this drainage line, there is some opportunity to retain woodland in this western half and connect Patches 1 and 4 along the stream by re-vegetating and enhancing the habitats along the stream.

Retention of Shale Sandstone Transition Forest

The SSTF (Patch 6) includes old trees along the riparian corridor and the patch of trees on site links or goes close to linking with more intact vegetation to the north of the site. This means that there is considerable value in maintaining the riparian portion of this patch intact and building upon its condition and its potential to link to more intact vegetation to the north. It is recognised that there will be a mandatory riparian buffer zone on either side of the tributary from the top of both eastern and western bank of a tributary of Cataract Creek, within which no development will be permitted. Notwithstanding this, there would be a great benefit to retaining the majority of the SSTF flanking the creek as this would allow the majority of large hollow-bearing trees on the subject site to be conserved. Due to the general low density of tree cover and woody understorey within the area of SSTF patch away from the creek, there is potential for larger lots to locate building footprints in suitably cleared areas whilst avoiding clearance of trees, if appropriate mechanisms could be emplaced to encourage tree retention/vegetation protection.

In theory, all of patches of CPW and SSTF vegetation could be conserved on the site. This would require substantial and ongoing management to maintain their condition as the site is developed around them. Some of the patches, particularly the smallest patches and the eastern edges of Patches 4 and 5, are likely to be difficult to conserve as they have a large edge to area ratio and are heavily disturbed. By contrast Patch 6 is largely along a riparian corridor which will need to be conserved and managed in any case according to current guidelines for riparian corridors. It also has high concentrations of older trees, and links to more intact vegetation to the north. It is likely to have better prospects for long term conservation in the future. 100% retention of the TEC's would not be practical, lead to a good urban design or environmental outcome. As such, the mapped patches of CPW and SSTF were re-examined with respect to the possible retention of the better quality areas of woodland and open forest on the subject site.

After consideration of the current condition of TEC vegetation on the subject site, Cumberland Ecology has recommended that the following points are adopted in the rezoning:

- Creeks should be considered as focal points or areas for the future conservation of forest and woodland on the subject site;
- The creek linking Patch 1 and the western portion of Patch 4 are zoned for conservation and actively regenerated to form a north western patch of CPW;
- The riparian area of Patch 6 containing the SSTF with large old trees with hollows is zoned for conservation and actively managed to form a north eastern patch of SSTF;
- The eastern "bulge" of Patch 6, which is younger regrowth, should also be considered for retention but could be amenable to retain within larger lots of land, with appropriate mechanisms in place to encourage tree retention; and
- Remaining smaller patches of CPW be either considered for retention (if this can feasibly be done, considering all other factors during the rezoning), or, if cleared, then a suitable offset be provided off site to compensate for the loss due to clearing.

A schematic summary of these recommendations is provided in Figure 44.

FIGURE 3 - Options to Retain Cumberland Plain Woodland and Shale Sandstone Transition Forest on the Subject Site

Figure 44. Summary of recommended ecological options

The majority of the site has been cleared due to a long history of agricultural land use and consists of mainly exotic pastures, farm dams, farm housing and infrastructure. None of the native vegetation of the site (CPW and SSTF) has been mapped as having a high ecological value. The vegetation patches, much of which are isolated paddock trees, are not large, are irregular in shape and are surrounded by heavily cleared and modified farmland. This creates both long and short term challenges for conservation. Left 'in situ' these patches are likely to become increasingly isolated and for edge effects including encroachment of weeds and disturbance by humans and animals, to become more significant.

There are also design and planning difficulties in accommodating urban development around, in particular the CPW patches, due to their size and shape, namely:

- isolated and fragmented pockets of developable area that are not visually or physically integrated or connected with other parts of the site;
- increased edge effects – the edge of a larger consolidated area of vegetation can be more effectively treated and controlled than a number of smaller patches and a greater proportion of the 'core' area of vegetation can be protected; and
- reduced efficiencies in terms of road layout, lot configuration and servicing.

8.1.2. Proposed Strategy

The planning proposal presents a biodiversity strategy that:

- secures the conservation of native vegetation on the site that is likely to continue to deteriorate under the existing planning regime for the site (i.e. continued rural / farming use or subdivision of the site into 2 hectare parcels and the construction of up to 200 houses) and potential worsening of edge effects;
- retains the better quality patches of CPW and SSTF on the site (approximately 5.8 hectares of CPW and 12 hectares of SSTF), along existing creeks lines and riparian corridors, and where the prospects for the practical long term conservation of vegetation are increased;
- outlines a commitment to undertake re-vegetation and improvement works of retained areas of native vegetation. This is to be implemented through the preparation and implementation of vegetation management plans and is identified in the voluntary planning agreement; and
- recognises that additional off site offsets are to be purchased to compensate for the loss of remaining vegetation, namely the purchase BioBanking biodiversity credits, the quantum and type to be determined via a BioBanking assessment.

In this context, the loss of a limited amount of poorer quality vegetation is considered acceptable.

The majority of the subject site will be owned by one landholder including the lots on which the TEC vegetation occurs. It will be possible for detailed and consistent consideration to be made about the future conservation or offsetting of vegetation on the subject site that will occur as a result of the rezoning and subsequent land use changes.

8.1.3. Other Considerations

Vegetated Riparian Zones (VRZ)

It is mandatory to retain or create a vegetated riparian zone along either side of the creeks on the subject site. The widths of the riparian zones are dependent upon the stream order with high order stream having wider buffers. This may result in some expansion of riparian treed areas.

Bushfire Asset Protection Zones

The subject site is currently heavily grazed and fuel loads are reduced as a result. If one or more patches are to be conserved on site, and grazing ceases, fuel loads will increase. This will be particularly so for the SSTF along Cataract Creek (Patch 6). Asset Protection Zones (APZs) will need to be created in association with areas of SSTF and CPW that are to be retained on site.

Vegetation Management Plan

All retained areas of native vegetation will need to be very actively managed to maintain and improve their condition as the subject site is developed around them. The management of such native vegetation should be carried out under an approved management plan that coordinates the schedule of management works and which sets out clear outcomes and measurable targets for re-vegetation and improvement works.

Need for Off Site Biodiversity Outcomes

It is likely that even with the partial retention of CPW and SSTF on site, additional off site offsets will be required to compensate for the loss of TECs. Suitable offsets that should be considered include the purchase of BioBanking biodiversity credits, the quantum and type to be determined via a BioBanking assessment of the rezoning proposal during preparation of a detailed flora and fauna assessment report that will be completed at a later stage in the assessment process.

8.2. Transport and Access assessment

A Transport and Access Impact assessment of the planning proposal and ILP has been prepared by GTA Consultants (refer to **Appendix F**). The assessment included the consideration of the following:

- existing and base year (2036) traffic conditions surrounding the site;
- the traffic generating characteristics of the planning proposal; and
- the transport impact of the planning proposal on the surrounding road network.

As demonstrated, with the required infrastructure improvements, the proposed development will have acceptable traffic impacts.

The methodology used to assess transport infrastructure requirements for Box Hill North (including capacities, levels of service, intersection analysis and traffic generations) is consistent with that used by GHD Pty Ltd for Box Hill and Box Hill Industrial.

8.2.1. Methodology

The following scenarios were used to compare the impacts of Box Hill North generated traffic on the local road network:

- Base = Existing + Background Growth (for year 2036) + Full Development of Box Hill and Box Hill Industrial Precincts; and
- Full Development = Base + Full Development of Box Hill North.

The *Austroads Guide to Traffic Management – Part 3: Traffic Studies and Analysis* was used to provide typical mid-block capacities for urban roads. These capacities were then used to determine the traffic capacity values for key roads in the vicinity of Box Hill North (Windsor Road, Old Pitt Town Road, Terry Road and The Water Lane). These values are consistent with the values used in the 2011 Box Hill and Box Hill Industrial – Transport and Access Study. The operation of key intersections has been assessed using SIDRA INTERSECTION.

8.2.2. Planned and committed infrastructures works in Box Hill and Box Hill Industrial Precincts

Intersection improvements planned as part of Box Hill and Box Hill Industrial Precincts include the following:

- Windsor Road/ Nelson Road – conversion to three-way intersection;
- Windsor Road/ Terry Road/ Garfield Road – additional right-turn lane along Windsor Road East, two lanes (one through, one right turn) along Terry Road and Garfield Road;
- Windsor Road/ Mount Carmel Road – new signalised; and

- Windsor Road/ Boundary Road – conversion to four-way with re-alignment of Loftus Street.

8.2.3. Traffic Generation

Traffic generation estimates for Box Hill North are provided in Table 12. As shown, the residential component of Box Hill North is likely to generate 3,145 vehicle movements in a peak hour.

Table 12. Peak Hour Traffic Generation

Land Use	Dwellings	Traffic Generation Rate	Traffic Generation
Low Density Residential	3,280	0.85 trips/ dwelling	2,788
Medium Density Residential	615	0.50 trips/ dwelling	308
High Density Residential	205	0.24 trips/ dwelling	49
Total	**4,100**		**3,145**

Distribution and assignment

For the purposes of estimating vehicle movements, the directional distributions and assignment of traffic generated by Box Hill North is 30-45% via Boundary Road, 25-40% via Terry Road and 5-15% via Old Pitt Town Road. A detailed distribution and assignment is provided in **Appendix F** of the GTA report. In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) of 20% inbound and 80% outbound during the morning peak hour and 80% inbound and 20% outbound during the afternoon peak hour has been adopted for the purposes of the transport and access assessment.

Levels of service

The level of service of roadway sections have been assessed using the typical ranges of volume-capacity ratios. A comparison of the anticipated roadway level of service prior to and following the full development of Box Hill North is provided below in Figure XX and Figure XX for the AM and PM peak hours respectively.

In both the AM and PM Peak:

- Windsor Road westbound and Old Pitt Town Road westbound (between Boundary Road and Terry Road) would operate at a LOS F;
- Old Pitt Town Road eastbound (between Boundary Road and Terry Road) would operate at a LOS E; and
- Terry Road northbound (between Mason Road and George Street) would operate at a LOS F.

Intersection assessment

The operation of key intersections with the anticipated Box Hill North traffic has been assessed using SIDRA INTERSECTION. A comparison of the anticipated future operation of key intersections prior to and following the full development of Box Hill North is provided in Figures 45 and 46.

Figure 45 indicates that with Box Hill North traffic:

- Windsor Road eastbound and Old Pitt Town Road eastbound (between Boundary Road and Terry Road) would operate at a LOS F;
- Windsor Road westbound and Terry Road southbound (between Old Pitt Town Road and Mason Road) would operate at a LOS E;

It is noted that Terry Road southbound (between Mason Road and George Street) would operate at a LOS F.

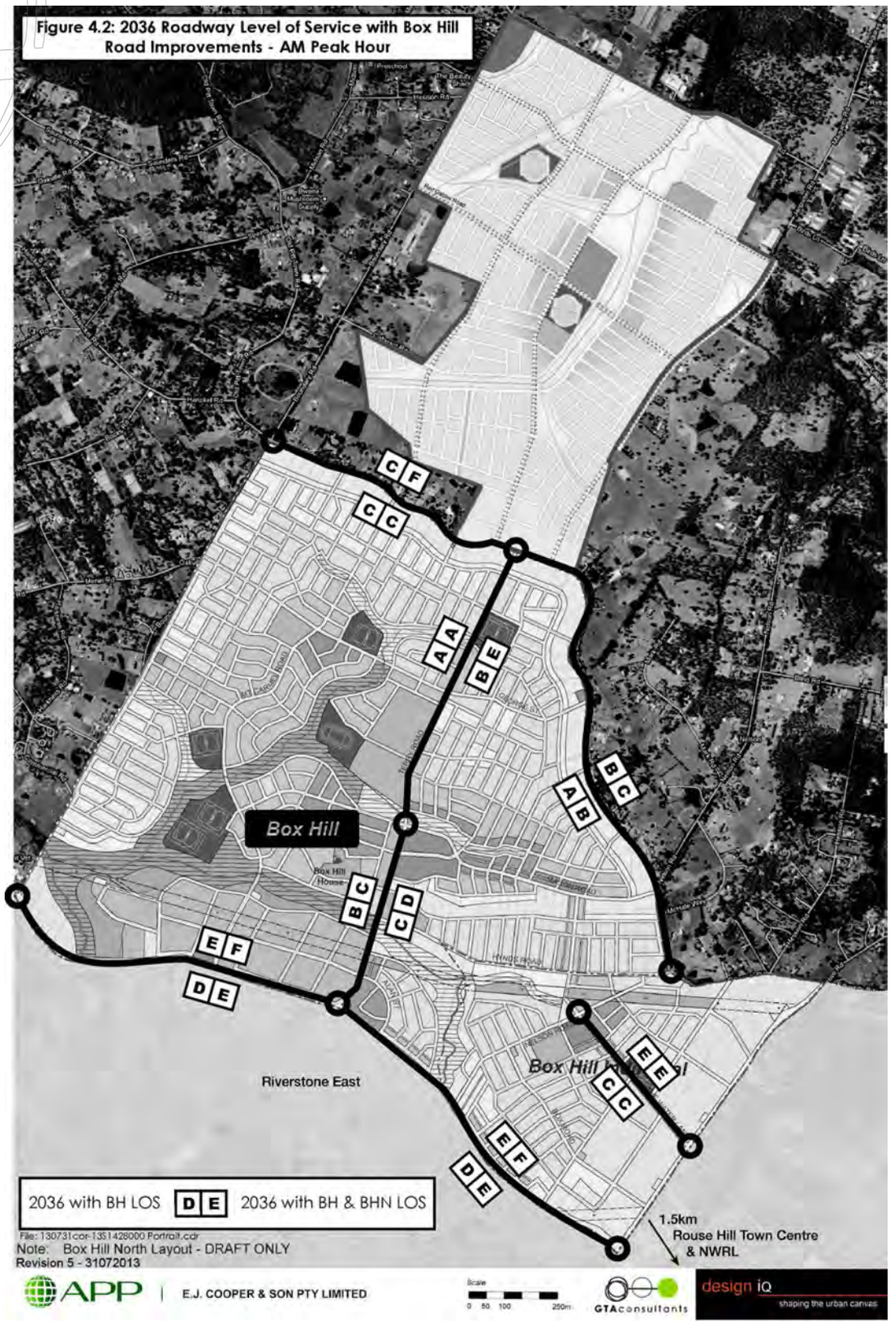


Figure 45. Anticipated roadway service - AM peak hour

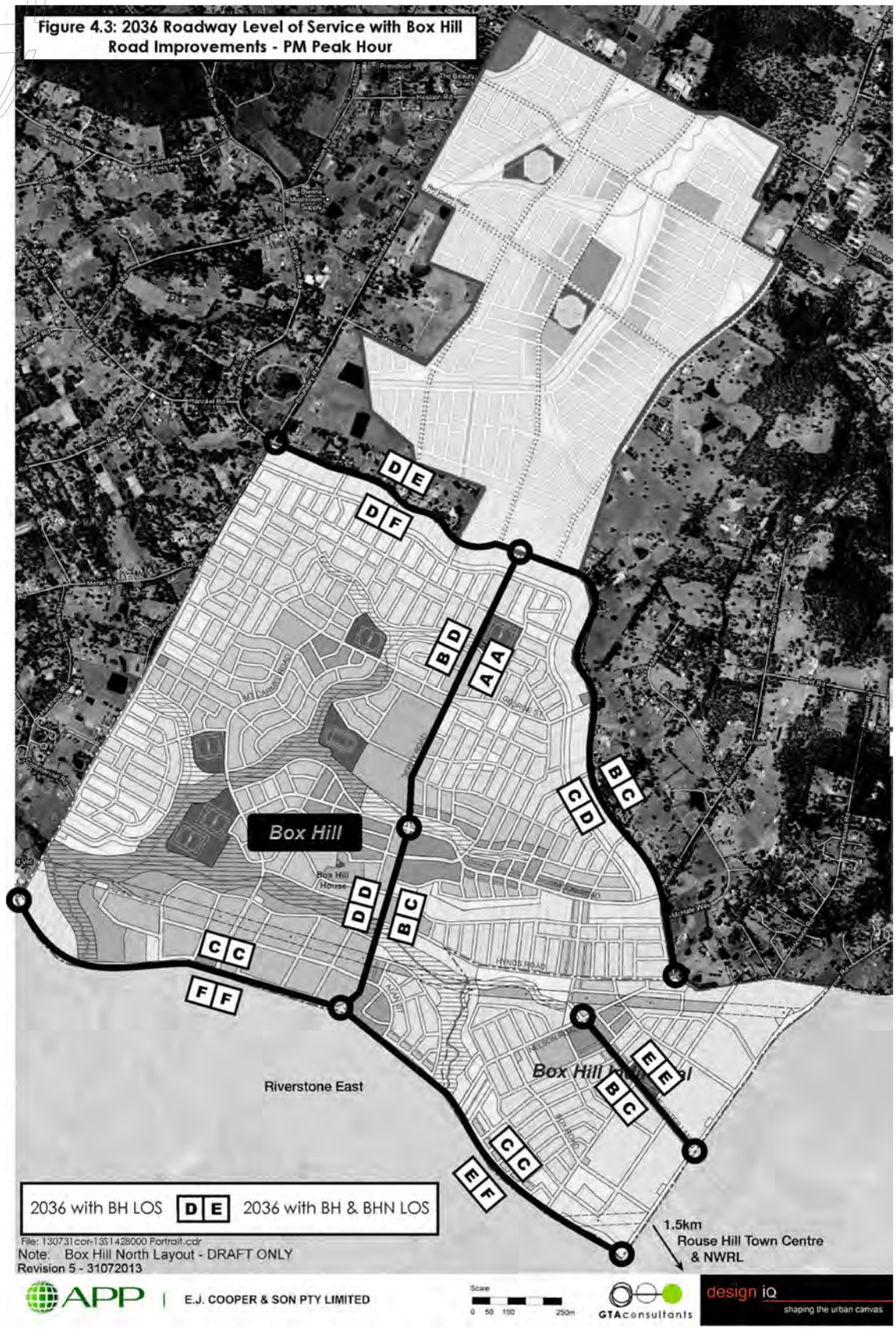


Figure 46. Anticipated roadway service - PM peak hour

Figure 46 indicates that with Box Hill North traffic:

- Windsor Road westbound and Old Pitt Town Road westbound (between Boundary Road and Terry Road) would operate at a LOS F;
- Old Pitt Town Road eastbound (between Boundary Road and Terry Road) would operate at a LOS E;

It is noted that Terry Road northbound (between Mason Road and George Street) would operate at a LOS F.

Intersection assessment

The operation of key intersections with the anticipated Box Hill North traffic has been assessed using SIDRA INTERSECTION. A comparison of the anticipated future operation of key intersections prior to and following the full development of Box Hill North is provided in Figures 47 and 48.

As shown in Figure 47, the following intersections during the AM Peak would operate at LOS F :

- Old Pitt Town Road/ Boundary Road (from LOS C);
- Old Pitt Town Road/ Terry Road (from LOS C);
- Windsor Road/ Nelson Road (from LOS D);
- Windsor Road/ Box Road (from LOS B); and
- Windsor Road/ Annangrove Road (from LOS D).

The following intersections operate at a LOS E:

- Old Pitt Town Road/ Mount Carmel Road (from LOS D);
- Windsor Road/ Boundary Road (from LOS D); and
- Windsor Road/ Terry Road (from LOS D).

The intersection of Windsor Road/ Mount Carmel Road operates at LOS E before the full development of Box Hill North.

The analysis of the addition of Box Hill North generated traffic indicates significant delays (and queuing) at the following approaches:

- south approach of the Windsor Road/ Terry Road/ Garfield Road East intersection;
- north and east approaches of the Old Pitt Town Road/ Boundary Road intersection; and
- south and west approaches of the Old Pitt Town Road/ Terry Road intersection.

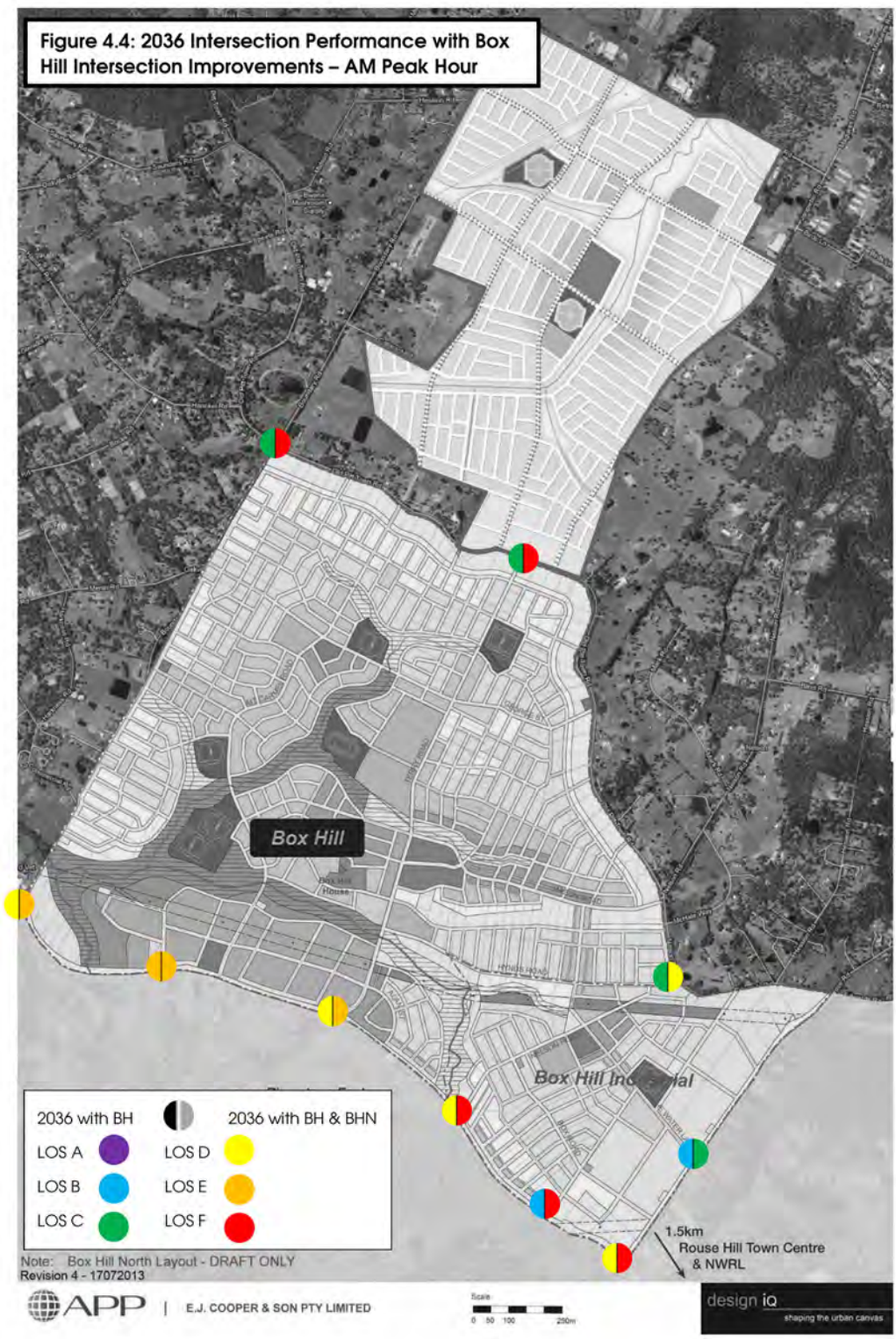


Figure 47. Intersection Performance - AM Peak Hour

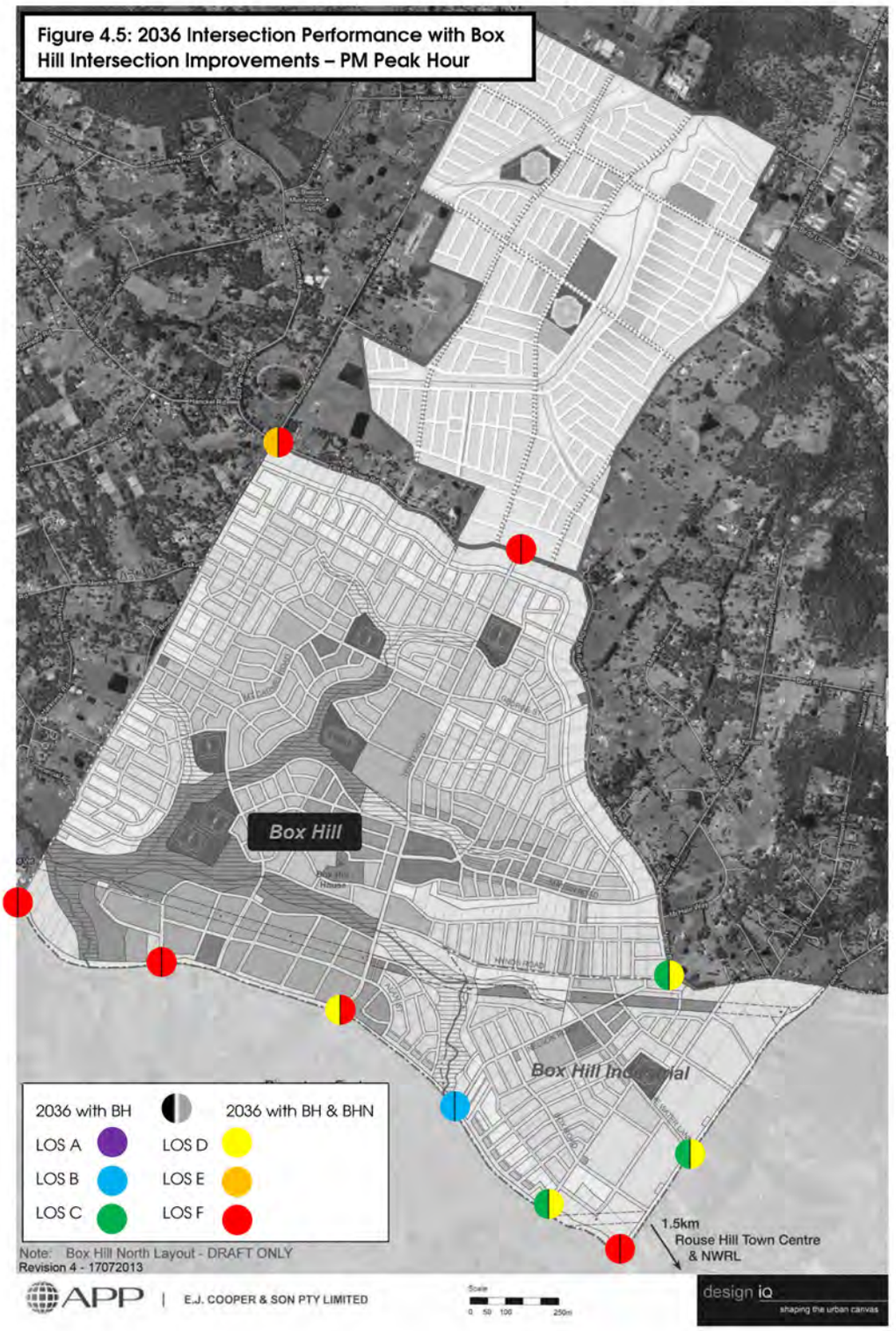


Figure 48. Intersection Performance - PM Peak Hour

As shown in Figure 48, the following intersections during the PM Peak would operate at LOS F:

- Old Pitt Town Road/ Boundary Road (from LOS E); and
- Windsor Road/ Terry Road (from LOS D).

It should be noted that the following intersections operated at LOS F before the full development of Box Hill North:

- Old Pitt Town Road/ Mount Carmel Road;
- Old Pitt Town Road/ Terry Road;
- Windsor Road/ Boundary Road;
- Windsor Road/ Mount Carmel Road; and
- Windsor Road/ Annangrove Road.

With the addition of Box Hill North generated traffic, a detailed analysis of the results indicate significant delays (and queuing) at the following approaches*:

- south and east approach of Windsor Road/ Terry Road/ Garfield Road East intersection;
- east approach of Windsor Road/ Annangrove Road intersection;
- south and east approaches of Old Pitt Town Road/ Boundary Road intersection; and
- south approach of Old Pitt Town Road/ Terry Road intersection.

8.2.4. Proposed Additional Infrastructure Works

Based on the results of the transport assessment and the proposed access locations, infrastructure works will be required as a result of Box Hill North. These are summarised in Table 13 and shown graphically in Figure 49.

Table 13. Proposed Intersection Improvement Works to accommodate Box Hill North

Item No.	Intersection Location	Proposed Improvement	Comments
Windsor Road Intersections			
1	Windsor Rd / Boundary Rd / Loftus Street	Extension of turning lane lengths: • Windsor Rd westbound right turn lane • Boundary Rd southbound left and right turn lanes-	
2	Windsor Rd / Mt Carmel Rd	Extension of turning lane lengths: • Windsor Rd eastbound left turn lane • Mount Carmel Rd southbound right turn lane	This is a new intersection proposed as part of the Box Hill and Box Hill Industrial Precincts.
3	Windsor Rd / Terry Rd / Garfield Rd	Extension of turning lane lengths: • Windsor Rd westbound right turn lane • Terry Rd southbound left turn lane	
4	Windsor Rd / Box Rd/ Guntawong Rd	Extension of turning lane length: • Guntawong Rd northbound left turn lane	Additional storage capacity required on Guntawong Rd to accommodate additional through traffic along Windsor Rd associated with Box Hill North development
5	Windsor Rd / Annangrove Rd	Extension of turning lane length: • Windsor Rd westbound right turn lane	

* Excluding through movements along Windsor Road.

Item No.	Intersection Location	Proposed Improvement	Comments
Boundary Road Intersections			
6	Boundary Rd / Maguires Rd (BHN Access)	Give Way Control – localised pavement widening to accommodate turn lanes	
7	Boundary Rd / BHN Site Access / Hession Rd	Give Way Control – localised pavement widening to accommodate turn lanes	
8	Boundary Rd / Red Gables Rd (BHN Access)	Give Way Control – localised pavement widening to accommodate turn lanes	
9	Boundary Rd / Cataract Rd / BHN Site Access	Give Way Control – localised pavement widening to accommodate turn lanes	
10	Boundary Rd / Old Pitt Town Rd	Upgrade existing 1 lane roundabout to a dual (2) lane roundabout	Subject to further discussions with The Hills Shire Council this intersection could be upgraded with traffic signals. However, roundabout provides better operational performance with Box Hill North traffic distribution. A two lane roundabout also would incur a higher cost than traffic signals and thus the recommendation is considered financially conservative.
Old Pitt Town Road Intersections			
11	Old Pitt Town Rd / BHN Access Rd (west)	Provide a new dual (2) lane roundabout	Consideration was given to the provision of traffic signals at this location. However roundabout was selected due to proximity to Old Pitt Town Rd / Terry Rd intersection (approx. 150m).
12	Old Pitt Town Rd / Terry Rd	Upgrade existing intersection to a dual (2) lane roundabout	Consideration was given to the provision of traffic signals at this location. However roundabout was selected due to proximity to BHN access roads.
13	Old Pitt Town Rd / BHN Access Rd (east)	Provide a new dual (2) lane roundabout	Consideration was given to the provision of traffic signals at this location. However roundabout was selected due to proximity to Old Pitt Town Rd / Terry Rd intersection (approx. 150m).
Other Intersections			
14	Annangrove Rd / The Water Lane / Withers Rd	Provision of left turn slip lane on Annangrove Road northbound	

The intersection performance of the local road intersections with Box Hill North and Box Hill development traffic and network improvements is shown in Table 13. The improvement works to Windsor Road intersections have been proposed to retain the same level of service and operating conditions as with the Box Hill development and associated improvements. The Level of Service intersection operating conditions with the Box Hill North improvements are presented in Figures 50 and 51.

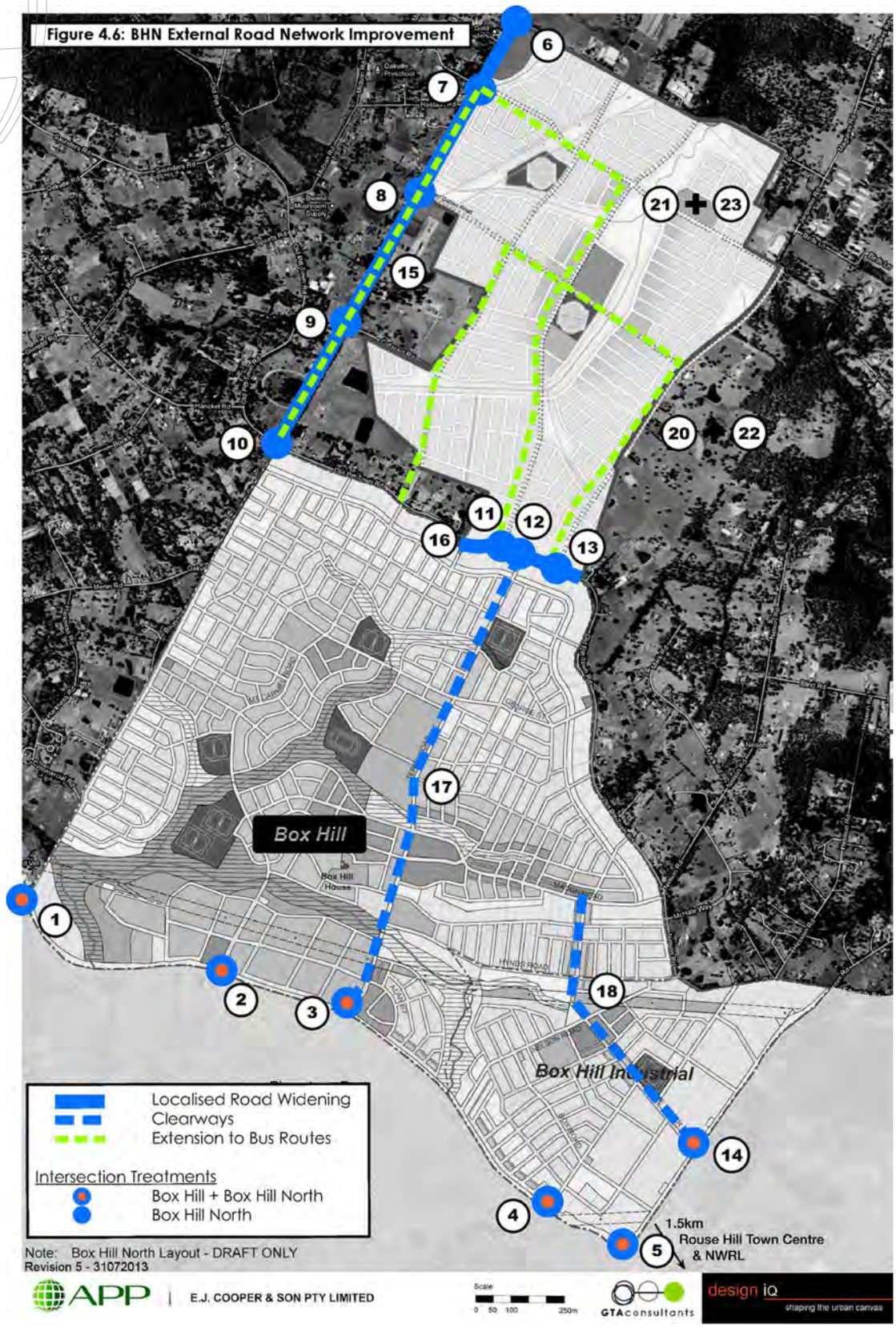


Figure 49. Proposed Infrastructure Works

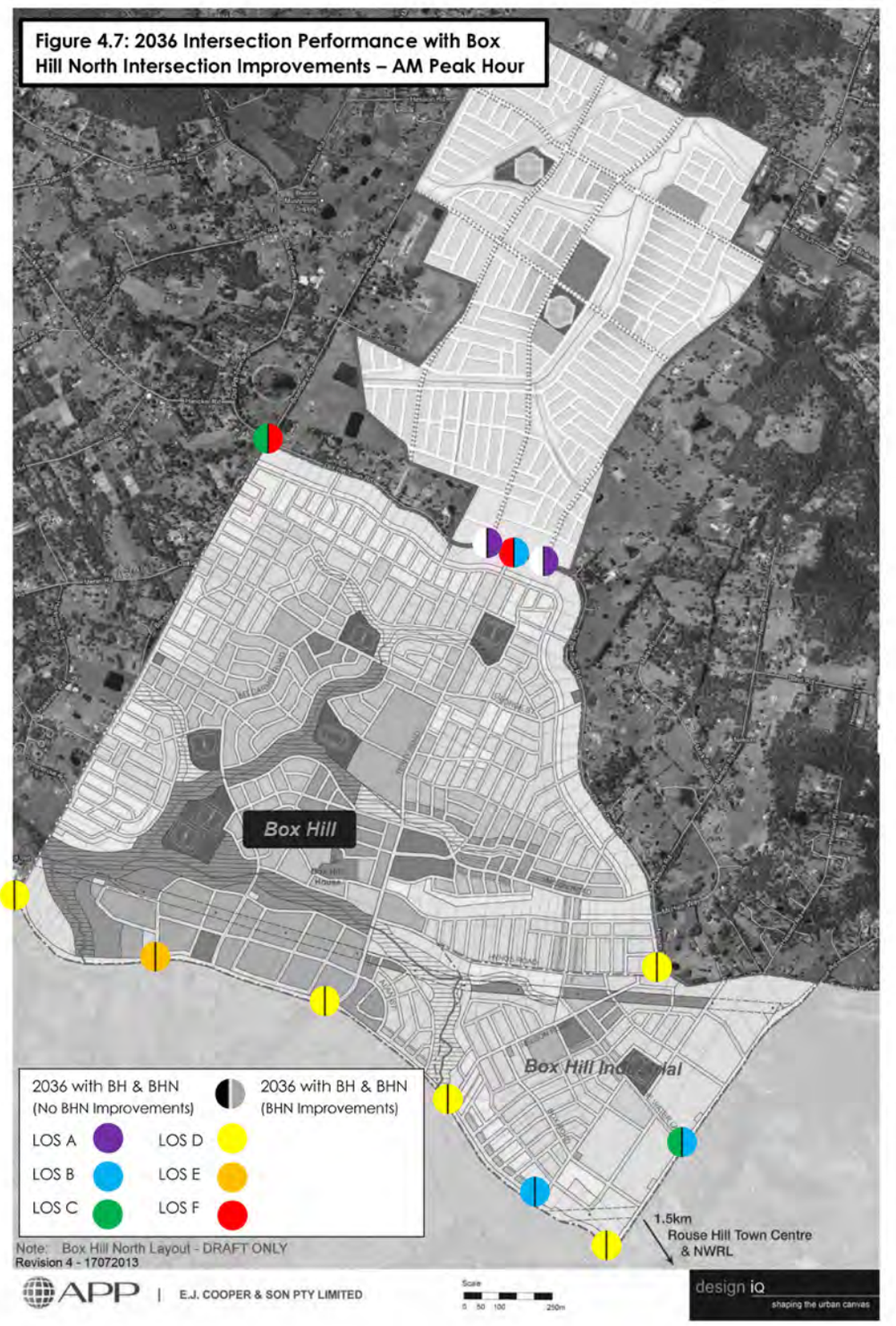


Figure 50. Intersection performance after improvements - AM peak hour

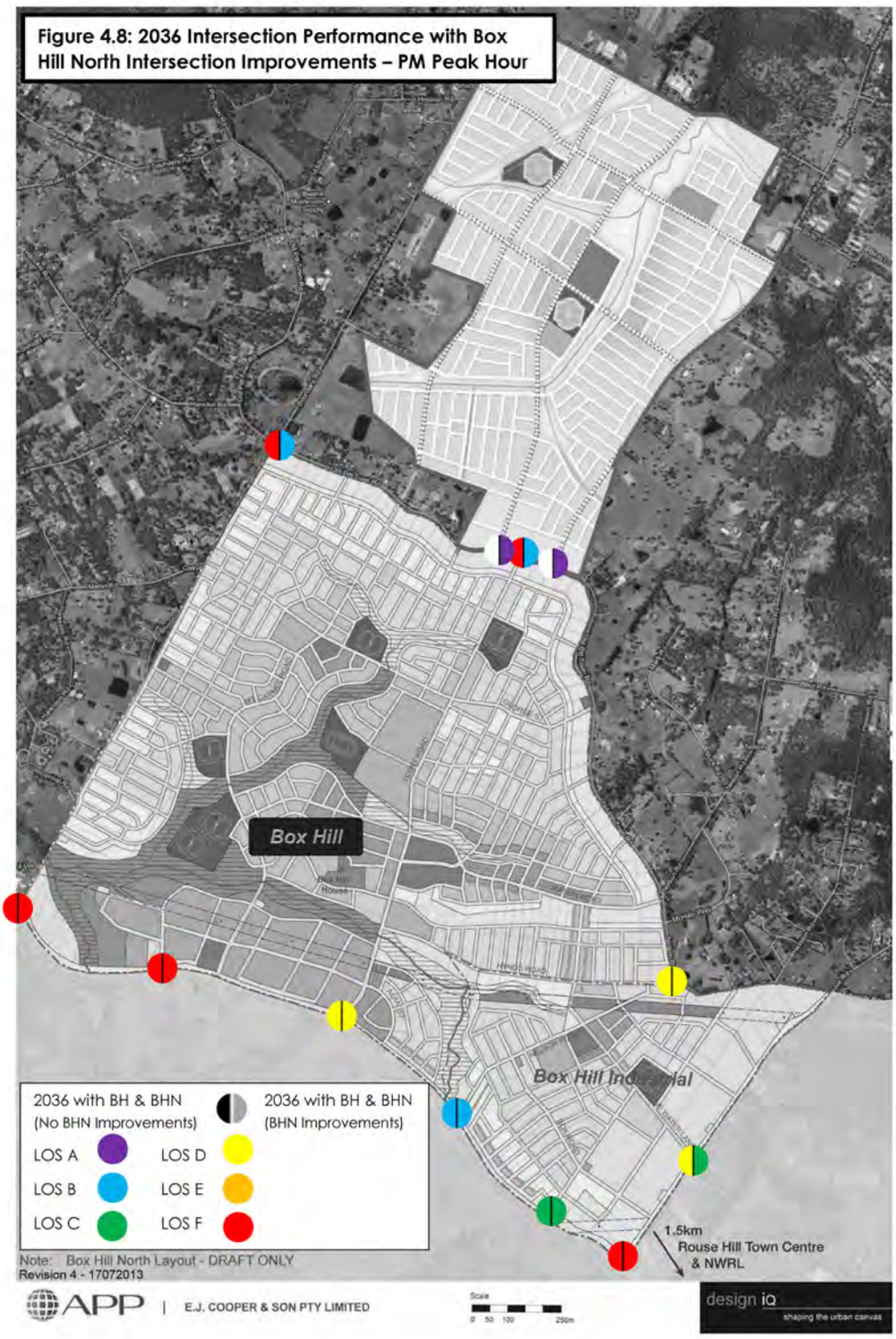


Figure 51. Intersection performance after improvements - PM peak hour

8.3. Water Cycle and Flood Management

A Water Cycle and Flood Management Strategy prepared by J.Wyndham Prince is included at **Appendix J**. The conclusions of this assessment are detailed below.

8.3.1. Hydrologic Analysis

A hydrologic analysis, using the rainfall - runoff flood routing model XP-RAFTS (Runoff and Flow Training Simulation with XP Graphical Interface) (Willing, 1996 & 1994), for the site was undertaken to determine the size of detention basins needed to restrict peak post development flows to pre development levels and also to generate peak flow rate hydrographs for input to the hydraulic model.

A summary of the proposed detention basin volumes for the Box Hill North Precinct are shown in Table 14.

Table 14. Summary of detention basin volumes

Basin	Total Storage Required (m3)
Basin 1	137,200
Basin 1 West	10,700
Basin 1 South	18,000
Basin 2	3,800
Basin 3	6,900
Basin 4	7,100

The detention storages that are located online to the water courses will also capture and attenuate flows from catchments upstream of Box Hill North. The modelling allows for an increase in imperviousness for these upstream catchments. The total catchment area draining to the basins is approximately 640 hectares. The total volume of storage provided therefore represents approximately 287m3/hectare, which is within the range expected for urban development.

The XP-RAFTS modelling undertaken has determined that the proposed detention storages are adequate to restrict post development peak discharges from the site, to pre-development levels for the 2 and 100 year ARI storm events, consistent with the requirements of the The Hills Shire Council Development Control Plan 2012. Whilst the online basins appear to be over attenuating peak post development flows, the higher detention volumes provided reduce peak post development flow rates and assist in minimising the flood impact downstream of the site. Without these volumes, flood levels were found to increase excessively (<100mm) downstream of the site in comparison to existing levels. It is believed that this is a result of the amount of flood storage within the site from the existing dams, even when the water levels are assumed to be close to crest levels during storm events. It is also noted that the average storage volume per hectare is approximately 287m3/ha (including upstream catchments), which is considered to be within the range for urban development. Opportunities to further optimise the detention basins can be considered at the development application and detailed design stages.

8.3.2. Flood Modelling

The 2D flood modelling of the water courses and trunk drainage channels that run through the Box Hill North development was undertaken using TUFLOW (Two-Dimensional Unsteady Flow). Flood modelling for the existing and developed scenarios was undertaken to determine the impact of the Box Hill North development on the flood levels in the creeks.

Existing Farm Dams

There are a number of significant existing farm dams, associated outlet channels and diversion structures located throughout the Box Hill North Precinct. The majority of the dams are located online to the existing water courses assessed in the flood modelling. The farm dams and associated structures significantly alter the existing case flood extent mapping and floodway definition from what would have occurred prior to their construction. This has been taken into consideration and discussed in the following sections. For the purpose of the existing case flood modelling it was assumed that the water level in the dams would generally be at the crest height for the storm durations assessed.

Overland Flow Paths

A broad scale creek and overland flow path assessment has previously been undertaken by Council. In addition to the major water courses running through the site, Council have identified a number of additional tributaries where the catchment is large enough to indicate that a trunk drainage corridor may be required. These catchments have been considered in this current assessment.

Flood Extent Mapping

Flood extent mapping has been completed for the 2 year and 100 year ARI's and PMF events under existing conditions. A series of other maps of specific ARI's have also been developed for this study as follows:

Existing Conditions

- Depth Profile – 2 year, 100 year ARI and PMF;
- Hazard Classification (100 year ARI and PMF only); and
- Provisional Hydraulic Categorisations (100 year ARI only).

Post Development Conditions

- Depth Profile - 2 year, 100 year ARI and PMF; and
- Hazard Classification - 100 year ARI.

The above scenarios were generally mapped for a "No tailwater" scenario.

Flood Difference Mapping

A map has been prepared which indicates the difference in 100 year ARI flood levels arising from the existing case and the proposed development within the site, which is provided as Figure 52. The figure indicates that development of the site, with the recommended controls, will result in some increases in flood levels within the bounds of the site which can be accommodated within the site's riparian corridors and drainage reserves and the filling of the urban areas within the site. The increase in flood levels external to the site are generally less than 100mm and are located within downstream riparian corridors and in locations where no development is located.

Hazard Categories

Hazard mapping was undertaken for 100 year ARI and PMF events from the TUFLOW runs completed as part of this study. Hazard grids are developed directly out of the TUFLOW model and have been used to produce the Hazard plans presented in this report. The floodplain has been divided into three Hazard categories (consistent with the NSW Floodplain Development Manual (FDM, 2005) as follows.

- Low Hazard;
- Transitional Hazard; and
- High Hazard.

Hazards maps are useful to obtain an appreciation of the relative depth and velocity of floodwater

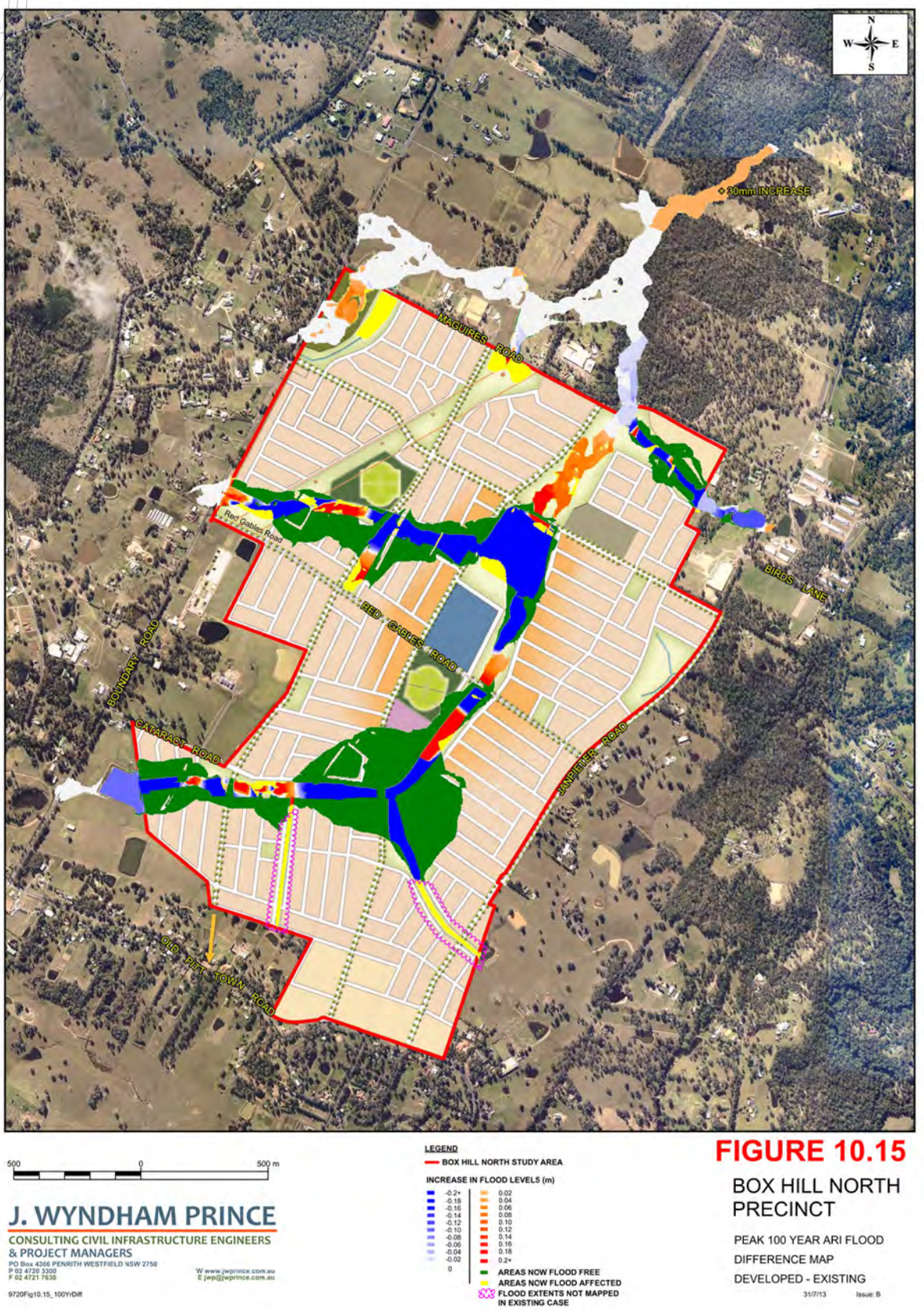


Figure 52. Flood Difference Mapping

within a locality and are a critical element in determining:

- The locations of critical public infrastructure such as hospitals and aged care facilities;
- The areas in the floodplain for which public safety is "at risk"; and
- Assist in the Flood Emergency response and Evacuation Management process.

During the PMF event, significant areas of the floodplain are affected by high hazard flooding and the potential impact on infrastructure within these high hazard areas and will need to be considered as part of the future detailed planning of Box Hill North.

Climate Change Impacts

The Climate Change flows (i.e. 15% increase in Design Rainfall Isopleths) have been used in the development of a post development post Climate Change hydraulic run. Generally the increase in the 100 year ARI flood levels as a result of the impact of climate change are less than 0.2 metres, which is within the component of the standard 0.5m freeboard which relates to climate variability.

Flood evacuation strategy

The proposed Box Hill North residential development areas are not impacted by the regional PMF event (the regional PMF extends only into a small portion of the northern riparian corridor area). Therefore, evacuation from the site to a regional facility is not necessary.

The local PMF event will affect a number of residents adjacent to the riparian corridors and drainage reserves. The local PMF is a short duration event that will occur and recede reasonably quickly (over a number of hours). The ILP and general land formation facilitates evacuation of affected residents through a continually rising grade to flood free land. The flood evacuation strategy will need to be considered and adopted by the State Emergency Services (as applicable) and Council.

8.3.3. Water Quality Analysis

MUSIC modelling was undertaken to demonstrate that the water cycle management system proposed for Box Hill North will result in reductions in overall post-development pollutant loads and that concentrations being discharged from the Precinct comply with the designated target objectives. Total annual pollutant load estimates were derived from the results of a MUSIC model based on a stochastic assessment of the developed site incorporating the proposed water quality treatment system. The proposed water quality management strategy for Box Hill North, as determined through a stochastic MUSIC assessment, achieves the reduction targets specified by the *Office of Environment and Heritage*.

8.3.4. Waterway Stability Management and Stream Erosion Index

The former Department of Environment and Climate Change (now OEH) and the Sydney Metropolitan Catchment Management Authority (SMCMA) have recently released draft guidelines outlining techniques to address the risk of stream erosion from the urbanisation of catchments. The stream erosion index is defined by OEH as the post development duration of flows greater than the 'stream forming flow' divided by natural duration of flows greater than the 'stream forming flow'. The 'stream forming flow' is defined as 50% of the 2 year ARI flow rate estimated for the catchment under natural conditions for cohesive bed and banks, 25% of the 2 year flow rate for moderately cohesive bed and banks and 10% of the 2 year flow rate for cohesion less bed and banks. The OEH guidelines recommend a stream erosion index of no greater than 3.5 – 5.

The MUSIC model developed for Box Hill North was utilised to determine the stream erosion index at each discharge point from the site. The results of the modelling illustrate that the Stream Erosion Index ranges between 2.29 and 4.28 for the developed sub-catchments for the eleven (11) years of rainfall data assessed, which is within the targets outlined by OEH (i.e. 3.5-5.0). The provision of WSUD elements within the Box Hill North Precinct development will

assist in minimising the impact of urbanisation on the waterway stability of the creeks within and downstream of the site.

8.4. Services and Utilities

An Infrastructure Services Assessment to support the planning proposal has been prepared by J.Wyndham Prince and is included at **Appendix I.** The purpose of the assessment was to provide an early indication of the constraints and opportunities for the provision of utility service infrastructure to serve Box Hill North and to demonstrate the manner in which it is intended to deliver this infrastructure.

A summary of the investigation's findings and conclusions for the following is provided below:

- electricity services;
- sewer services;
- potable water services;
- gas services; and
- telecommunication.

8.4.1. Electricity Services

The site is currently serviced for the low scale rural residential development that occurs there. The system is not capable of servicing any significant development of the site without substantial upgrade. The development will include normal street lighting (to Council standards), low voltage (LV) network (for house and built development supply), high voltage (HV) distribution network and appropriate transformer (HV/LV) network. The existing electrical reticulation within the Project site will be integrated into the new development street pattern to ensure that supply is continued to the existing dwellings adjacent to the development.

The development can be serviced for the required electrical demands from a proposed zone substation to be provided by Endeavour Energy as part of the Box Hill and Box Hill Industrial Precincts. Endeavour Energy is currently reviewing opportunities and site requirements for the zone substation location. The cost of the HV feeders from the Zone Substation and the cost of the HV/LV and Street lighting reticulation within the site will be borne by the developer of the site.

8.4.2. Sewer Services

The site is currently not serviced by Sydney Water sewerage infrastructure and the site does not drain naturally to any Sydney Water infrastructure. In addition to the normal sewer reticulation network required for a development of this nature, Box Hill North will also require the construction of a Sewerage Pumping Station (SPS). The location of this SPS is likely to be adjacent to Maguires Road at the northern end of the site.

Sydney Water are currently undertaking extensions to the trunk sewerage infrastructure within the Chain-of-Ponds Creek system that includes a large diameter sewer carrier from near Boundary Road to Vineyard and thence via a new SPS to Riverstone West Wastewater Treatment Plant (WWTP). Sydney Water have confirmed that this system can accommodate the proposed development of the Box Hill North Precinct (via the new SPS at Maguires Road).

The transfer of effluent from the Maguires Road SPS to the Chain-of-Ponds Carrier will need to be via an appropriately sized and located rising main. Current planning would suggest that the appropriate location for this is along the road reserve of Boundary Road. Subject to the installation of this SPS, rising main and the reticulation network within the site, the site development can be serviced with an appropriate sewer system. Sydney Water has confirmed that the new SPS and Rising Main would be subject to their procurement policies and reimbursement as development proceeds within the site.

8.4.3. Potable Water Services

The existing potable water service within the site is appropriately sized for the rural residential development. A significant amplification of this system will need to occur with the development of the site. Sydney Water has confirmed that the Bulk Supply to the site can occur from the Rouse Hill Elevated Reservoir; however the local supply may require a new reservoir close to the site.

Sydney Water currently operates the Oakville Elevated Reservoir immediately to the west of the site that is supplied via minor mains from Rouse Hill. It is proposed that a new surface reservoir be installed at the Oakville Reservoir site with a new supply line from Rouse Hill. Construction and planning of the new Surface Reservoir and Supply Main will be undertaken directly with Sydney Water and the developer of the site. Subject to the detail system requirements and design process, this system may also require a Transfer Booster Pump to deliver the potable water to the new reservoir. Sydney Water has confirmed that the new Reservoir and Supply Main would be subject to their procurement policies and reimbursement as development proceeds within the site.

8.4.4. Gas Services

The site is not currently serviced with natural gas reticulation. Jemena has confirmed that subject to appropriate notice and planning that the site can be serviced with natural gas.

8.4.5. Telecommunications Services

The site is currently serviced with telecommunication services consistent with rural residential uses currently operating on it. NBN Co has confirmed that the development can be serviced with appropriate' Fibre To The Premise' infrastructure. This will allow the individual property owner after housing is constructed to make individual arrangements with a telecommunications (broadband) provider.

8.5. Contamination

A Preliminary Site Investigation (PSI) has been prepared by JBS Environmental and is included at **Appendix B**. Based on the results of the PSI investigation as outlined in section 2.9, there is potential for subsurface contamination to be present on the site as a result of current and previous site usage (i.e. agriculture). Based on the site observations and agriculturally related site activities, it is considered that the potential for widespread contamination across the site is low, with the possible exception of asbestos.

Dangerous goods (petrol/diesel and chemical storage) are also likely to be present through-out the site, typical of the site's agricultural use. It is considered unlikely that the areas of environmental concern identified will have impacted the site to a degree that would prevent planning and development of the land for the intended use(s). The PSI report recommends that a Detailed Site Investigation (DSI) be completed to assess the extent of contamination prior to future detailed development. It is also recommended that, based on the age of the structures identified onsite, and the presence of suspected asbestos containing material, a hazardous materials building inspection be conducted for all structures located on the site to enable appropriate management during future development.

8.6. Aboriginal Heritage

An Aboriginal Heritage Assessment Report has been prepared by Kelleher Nightingale Consulting Pty Ltd and is included at **Appendix C**. The report assesses the aboriginal cultural heritage values of the site and the potential impacts of the proposed development on aboriginal cultural heritage. An assessment of the impact of the ILP on existing aboriginal archaeological sites, open artefact scatters and isolated finds on the site (as detailed in section XX) is provided below.

Two identified Aboriginal archaeological sites are contained within the proposed open space corridor bordering Cataract Creek and tributary:

- BHN 1 (grinding grooves); and
- BHN 4 (isolated find).

Two Aboriginal archaeological sites will be partially impacted by proposed development:

- BHN 2 (open artefact scatter); and
- BHN 3 (open artefact scatter).

The aboriginal heritage assessment has concluded that the impact to sites BHN 2 and 3 do not pose a constraint to the development of Box Hill North. The report recommends that the grinding grooves site (BHN 1) be conserved. Post rezoning, a Cultural Heritage Assessment Report (CHAR) and associated Aboriginal stakeholder consultation is be undertaken. This work will inform the preparation of an Aboriginal Heritage Impact Permit (AHIP) that will cover the entire study area to allow impacts to identified and potential archaeological deposits on site.

8.7. Social Planning

An assessment of the social infrastructure for the site has been prepared by Elton Consulting and is included at **Appendix G**. The assessment considered the demand for community facilities and open space likely to be generated by the proposed development and ways that demand will be addressed.

8.7.1. Community facilities and human services

To create a socially sustainable community which supports the health and well-being of the community and which promotes social interaction and the development of community networks, a population of around 13,200 people will generate demand for access to spaces for:

- organised community activities, programs and classes, such as playgroups, fitness groups and after school classes
- meetings of local organisations and community groups
- accommodation for community services and the delivery of sessional and outreach services
- a base for community development activities and community cultural events
- leisure activities for young people and for older people, and
- hire for private functions, such as birthday parties.

These uses are best provided for in a multi-purpose community centre which can incorporate a variety of large and smaller spaces suitable for a range of social, leisure and cultural activities. Based on the level of provision adopted for the North Kellyville Precinct (77 sqm/1000 residents), it is recommended that a community centre of around 1,000 m2 be provided in Box Hill North. This is broadly consistent with the benchmark of 80sqm/1000 people contained within Council's Community Centres Policy and Strategy (December 2006).

Facilities and services for older people

The proportion of older people expected to be attracted to Box Hill North will not be high. However, there will still be a number of older people in the area, and it will be important that their needs are met in order to ensure that they do not become isolated in an otherwise child and family oriented community. The social, leisure and recreational needs of older people may be met through mainstream services and facilities for the whole community, and through programs and activities for older people delivered within the recommended multi-purpose community centre at the local neighbourhood level and existing civic and cultural facilities at the district level.

Facilities for young people

Within Box Hill North, there will be a need for "things for young people to do" at the local level. At the local neighbourhood level, the needs of young people for space for social and leisure activities may be met through the proposed multi-purpose community centre, a well-designed public domain, open space, sporting and recreation facilities. It will be important that the multi-purpose community centre include spaces suitable for activities for young people, with a youth focus on both indoor and outdoor elements.

Libraries

Libraries are another type of community facility which fall within the responsibility of local councils. A district level library is already provided by Council within the Rouse Hill town centre to serve the Shire's growth centre precincts. Council staff have advised that this library will be able to meet the needs of the Box Hill North development and that no additional library facilities will be required.

Schools

The Department of Education and Communities (DEC) Advisory Notes for School Site Selection sets out the following criteria for the provision of schools in areas of new residential development:

- one public primary school per 2,000 to 2,500 new dwellings; and
- one public high school per 6,000 to 7,500 dwellings (i.e. catchment of three primary schools).

Preliminary advice from representatives from DEC indicates that existing primary schools in the surrounding area and those proposed for Box Hill will not have any capacity to meet the needs generated by Box Hill North, and that one new primary school will need to be provided within the development. Although the forecast dwelling yield comes close to the threshold that would trigger requirements for a second primary school, it is felt that at this stage of planning, one primary school is likely to be sufficient for the development. The Department is likely to wait to see how quickly development in Box Hill Precinct, where additional primary schools are proposed, and in the surrounding district occurs before determining need for a second primary school. The ILP includes a 2.2 hectare school site adjacent to open space.

In terms of high schools, as noted in section 2.15, Windsor High School, the school designated to serve the Box Hill North area, has considerable spare capacity (with capacity for 1,100 students and current enrolment of 502 students). It occupies a large site (8 ha) and contains 55 classrooms, of which only 31 are currently in use. It is likely that Windsor High will be able to absorb demand generated by Box Hill North, without the need to provide an additional high school within the precinct. However, this is subject to more detailed planning and demographic modelling within the Department.

The population of Box Hill North will not be large enough to warrant the provision of tertiary or technical and further education facilities, and will instead rely on those in the wider region.

Public health services

The population will not be large enough to justify the provision of any community health or hospital facilities within the precinct, but will instead rely on those in the wider region. Health service planners from the Western Sydney

Local Health District have advised that population growth within the growth areas of The Hills Shire will be accommodated through:

- the current redevelopment of Blacktown and Mount Druitt Hospitals and proposed further development of Westmead Hospital;
- a new integrated health care centre within the Rouse Hill town centre.

Emergency Services

The ways in which emergency services (including police, fire, rural fire, ambulance and SES) plan to service the northern precincts of the North West Growth Centre will determine how the Box Hill North development is serviced. The Precinct Plan for Box Hill and Box Hill Industrial Precincts

makes clear that these agencies have not yet developed firm plans for the area and at this stage, no new facilities are proposed within those precincts. However, proposed population growth across the Growth Centre will, over time, necessitate the provision of some new facilities. These are unlikely to be located within Box Hill North, given its location on the periphery of the urban area, but are more likely to be located centrally, close to the proposed Box Hill town centre. In the longer term, these facilities will absorb demand likely to be generated by Box Hill North.

Neighbourhood shopping

Residents of Box Hill North will enjoy easy access to the retail / commercial centre proposed to be located in the central portion of the site. This town centre will make provision for up to 10,000 m2 of retail / commercial floor space including a supermarket and a variety of shops and commercial services and gathering places such as cafes, restaurants and outdoor civic spaces.

Childcare facilities

In common with the provision of childcare in most new developments, childcare in Box Hill North will be provided by private sector providers, as demand develops. The number of childcare centres required will depend upon the size of each centre in terms of number of childcare places. There is no standard size of centre. However, for reasons of cost efficiencies, there is a trend to provide larger centres (80+ places), where local demand justifies this.

It is anticipated that at least one large childcare centre will be provided within or close to the town centre once need can be demonstrated.

Private schools

Providers of independent schools undertake detailed demographic and feasibility assessments before committing to new release areas. They also tend to acquire their sites through market processes, rather than necessarily acquiring sites designated in master plans. At this stage, no other providers of independent schools who may have an interest in Box Hill North have been identified.

Medical services

A population of around 13,200 people will generate a need for about 9 local general practitioners, based on a Western Sydney benchmark of one GP per 1,500 people. The proposed town centre will provide sufficient commercial space for local medical centres. Commercial space within the town centre will also be suitable for local services such as dentists and allied health services.

Welfare and support services

The Box Hill North population is expected to be reasonably affluent and active, and demand for welfare and support services will be modest. However, given the experience of nearby release areas (particularly in relation to stress associated with the high cost of housing, both parents needing to work and long commuting times), there may be some need generated for family support services. Such services are best located in major centres where they are accessible by public transport.

Places of worship

As well as providing places of worship, churches can provide an important base for community development, youth, volunteer and welfare support activities in new communities, and are important in building community spirit and identity. It is important that places of worship can be established within the Box Hill North area. The acquisition of sites for places of worship is generally left to market forces, according to their ability to purchase sites, and it is difficult to specifically identify sites in the rezoning process. Places of public worship are permissible uses within the R1 General Residential and R3 Medium Density zones under The Hills LEP 2012. The planning proposal does not propose to amend the land use tables in respect of ‘places of public worship’.

Residential aged care

In the longer term, some provision will also need to be made in the area for residential aged care facilities (hostels and nursing homes). These facilities are funded by the Commonwealth Government according to planning benchmarks based on numbers of people aged 70+. As these numbers cannot be forecast at this early stage of planning, (and as the planning benchmarks are regularly changed in line with policy shifts) it is not possible to predict precise needs now.

Leisure and entertainment

Entertainment and leisure facilities such as restaurants, cinemas, clubs and pubs are provided on a commercial basis according to market demand. It is anticipated that town centre in Box Hill North will provide facilities such as cafes and restaurants, but that residents will rely on the town centres at Rouse Hill and Box Hill for a wider range of leisure and entertainment opportunities, consistent with their status as town centres. The new population of Box Hill North will contribute to demand for these types and facilities and help enhance their viability.

8.7.2. Open space and recreation needs

In terms of open space and recreation, the broad needs of the Box Hill North population will include the following:

- The large proportion of families suggests the need for a variety of parks for informal play and passive recreation that support family and community activities.
- Parks that are locally accessible and which provide high quality and well maintained facilities that support recreation and play will be required. People should have the potential to walk to open space for activities, which will generally require residents to be within 400-500m of usable open space.
- There will be demand for outdoor areas for larger gatherings and cultural events e.g. extended family and group picnics, amphitheatre, markets.
- A relatively large proportion of children is likely and this highlights the need for playgrounds and other outdoor activity opportunities such as bike tracks, BMX and skateboarding.
- The likely large proportion of young people highlights the need for parks and public spaces that are designed to be friendly to young people, providing meeting places that are safe and welcoming and allow for social interaction and informal games.
- The large proportion of adults suggests potential high demand for lower impact and flexible physical activity opportunities such as walking and bike riding. Linear connections and a network of walking and cycling tracks should be provided to support the potential high participation in walking and provide links to key destinations and recreation nodes.
- Opportunities that increase incidental physical activity, through design of footpaths, road networks and accessible, safe and well lit walking and cycling tracks should be provided.
- The open space network should also include areas to walk dogs, and off leash exercise areas for dogs.
- Options to enhance individual fitness in parks and trails will also be important.
- Opportunities to enjoy bushland, water and other natural settings, for picnics, bushwalking and as spaces for reflection, rest and relaxation will be valuable to broaden recreation opportunities.
- To meet the demand for organised sport, multipurpose playing fields that are suitable for a variety of field sports, and able to accommodate both junior and adult sporting activities for males and females will be required.
- There will also be demand for access to both outdoor and indoor courts for court sports, and indoor spaces for activities such as dance, martial arts, yoga, fitness, gym.

8.7.3. Overall quantum of open space

The proposed quantum has considered likely requirements for:

- sporting fields;
- local parks for informal recreation;
- local playgrounds; and
- linear open space and linkages for walking /cycling trails.

The ILP makes provision for 66.76 hectares of open space (sporting fields, local parks and passive recreation) or 5.19 hectares per 1,000 persons.

Sporting fields

The ILP for Box Hill North makes provision for 9.22 hectares of open space for sporting fields. This allows for the creation of two sports grounds, as follows:

- one of 4.368 hectares, located in the centre of the precinct adjoining the neighbourhood retail centre and primary school. It is proposed that this will provide one double playing field and associated setbacks, parking and surrounding passive open space. As identified in the previous chapter, it is also proposed that this sports park will provide shared open space for the co-located primary school.
- one sportsground of 4.851 hectares, located in the northern part of the development area. This sportsground makes use of land affected by electricity transmission lines to create a large area of open space which, subject to detailed design to accommodate the transmission lines, may accommodate two double playing fields or a large oval suitable for senior cricket / AFL together with a smaller field suitable for junior sports.

Outdoor court sports

Council staff have indicated a preference for outdoor courts (tennis, netball, basketball etc) to be clustered together to provide larger complexes suitable for district and regional competitions, rather than providing isolated single courts in each residential area. The Shire already has a large netball court complex in Kellyville and a tennis court complex is proposed for Box Hill Precinct. In line with Council advice, no provision has been made for outdoor sports courts within Box Hill North.

Aquatic and indoor sports

The forecast population will also generate demand for indoor sport, fitness and aquatic facilities. In line with advice provided by Council staff, such facilities (as public, Council-owned facilities) will not be required to be provided within Box Hill North and instead the population will rely on existing facilities in the surrounding area.

In terms of indoor sport, the Box Hill North population will generate demand for only one indoor court, based upon standards contained within the 2007 Recreation Strategy. However, single indoor courts are not viable. Instead it is proposed that the modest demand generated by Box Hill North can be catered for by the Bernie Mullane Indoor Recreation Centre in Kellyville or by proposed new indoor courts within Box Hill Precinct.

In terms of aquatic facilities, Council staff have advised that the area is adequately catered for by existing facilities in the surrounding district and Council has no plans to build any new aquatic facilities in this part of the Shire.

In terms of fitness, aerobic and gym facilities, these are most commonly provided by the private sector, as demand emerges. The proposed multi-purpose community centre for Box Hill North will contain spaces suitable for activities such as yoga, dance and children's martial arts and gymnastics classes.

Open space for informal recreation

Areas of open space for informal recreation (local parks) are shown on the draft ILP and amount

to 57.54 hectares. The proposed parks range in size from 0.45 hectares to 0.84 hectares, allowing for a diversity of recreation opportunities in both larger district parks and smaller local parks. The parks have been equitably distributed to ensure that all residents will be within 400-500 m walking distance from an area of open space (including parks, sporting fields or passive recreation areas) to support accessible participation in recreation.

Passive open space

The extensive passive areas of open space throughout the site present opportunities to create a network of linear open space along the main creek line and its tributaries. The amount of open space proposed as linear open space along the creek lines is 59.46 hectares. Although subject to detailed design, these spaces are intended to be a focal point for the development and will provide quality recreation settings and are likely to include barbecue and picnic facilities, seating, playgrounds, pathways.

8.8. Retail Analysis

An independent assessment of the market potential for the demand and scope of retail and commercial floor space within Box Hill North was undertaken by Location IQ (refer to **Appendix H**). The key findings of the assessment are summarised below.

Location and Proposed Development

The Box Hill North Precinct is planned to include up to 13,223 persons across some 4,100 dwellings. Reflecting the size of the development, future retail and community facilities are planned to form part of the release area. The main trade area population has been estimated at 2,940 in 2011 and is projected to increase substantially to 20,950 persons by 2031.

The nearest existing major retail facilities are currently provided at Rouse Hill, approximately 10 km south east of the Box Hill North Precinct. Rouse Hill includes the Rouse Hill Town Centre, the nearest sub-regional shopping centre as well as a range of supermarket facilities. Rouse Hill forms the major non-food shopping destination within the region.

Analysis

In Australia there is typically around 2.2m2 of retail floor space is provided for every person. There is currently no existing retail floor space within the Box Hill North trade area. Around 30 % of retail floor space, or approximately 0.66 m2 per person, is generally allocated to bulky goods/ showroom floorspace. Reflecting the internalised location of Box Hill North, a limited provision is assumed locally, resulting in some 1.6 m2 per person of remaining floorspace.

The 2013 Box Hill North main trade area population of 3,000 people could support 4,800 m2 of retail floorspace at a rate of 1.6 m2 per person. This is projected to increase substantially to around 33,520 m2 by 2031, reflecting the growth within the Box Hill North main trade area. A large proportion of the main trade area residents' retail requirements will be serviced by the existing and future centres including at Rouse Hill as well as the proposed Box Hill Town Centre to the south of the precinct. As such, it is unlikely that all of the demanded retail floorspace would be provided at the proposed Box Hill North activity centre.

It is considered that at least 30%, or approximately 0.49 m2 per person (30% of 1.6 m2 per person), should be provided within the Box Hill North Precinct main trade area. The remaining 70% of retail floorspace would be provided for by larger non-food destinations, including surrounding sub-regional and regional shopping centres.

Given at least 30% of this floorspace should be provided within the Box Hill North Precinct activity centre, this would equate to around 1,440 m2 of supportable retail floorspace currently, with this provision increasing to 10,056m2 by 2031.

In Australia, one major full-line supermarket is typically provided for every 8,000 to 9,000 persons. As a result, with the primary sector population (Box Hill North precinct) projected to increase to

12,410 persons by 2031 and further to 13,233 upon completion, it can be seen that there is potential for a full-line supermarket in the immediate Box Hill North Precinct in the longer term. Indicative plans for the future Box Hill North activity centre indicate that the retail precinct will be located in the central area of the precinct and along a future major road within the locality. The centre will be positioned in close proximity to higher density residential. The site will also be positioned close to the existing Boundary Road.

Retail Analysis Conclusion

Based on the future population growth within the region, it is considered that a centre of up to 10,000 m2 would be supportable at a future activity centre (refer Table 11.2). The retail component should be anchored by a full-line supermarket of 4,000 m2. In addition to the above, a provision of supporting non-retail floorspace is likely to be supportable at the Box Hill North precinct, driven by the substantial future population growth and including key community facilities such as childcare and a medical centre.

Based on the proposed population projections and take-up rate, a supermarket based centre would be supportable at Box Hill North by 2021 at the earliest, with the centre likely to trade at more successful levels once the population is more established by 2026. Ultimately, it is possible that a centre of up to 10,000 m2 could be supportable at Box Hill North. This may include an additional small supermarket such as ALDI and/or further food catering stores to serve the growing population.

It is unlikely that a provision of mini-major or bulky goods/showroom floorspace would be supportable at the site reflecting the internalised location. These types of facilities would prefer to locate at larger regional and sub-regional shopping centres such as the existing Rouse Hill Town Centre or the proposed Box Hill Town Centre. Larger facilities within the region will continue to provide the major retail destinations for the future Box Hill North residential population, however, given the planned size of the precinct, it is important that a small provision of convenience/day-to-day retailing needs are provided locally.

A summary of the supportable floor space for the Box Hill North Town Centre, in the short term, is provided in Table 15.

Table 15. Box Hill North activity centre, supportable floorspace

Tenant / category	GLA (sq.m)	% of Total
Supermarket	4,000	51.6
Retail specialty	1,350	17.4
Total Retail	5,130	69.0
Non Retail Specialty	150	1.9
Commercial/Office	500	6.5
Medical Centre	450	5.8
Childcare	300	3,9
Tavern	400	5.2
Petrol Station	250	3.2
Gym	350	4.5
Total Site	**7,750**	**100.0**

SECTION 9.

Conclusion

9. Conclusion

The Planning Proposal presented in this report has been prepared to support an amendment to The Hills LEP 2012 to rezone a 380 hectare parcel of land at Box Hill North to accommodate a new sustainable residential community comprising 4,100 dwellings, a 5.5 hectare town centre, active and passive open space, a school site, new roads and infrastructure.

The strategic justification for the rezoning of Box Hill North has been demonstrated by the identification of Box Hill North as a 'strategic investigation site' as part of the Department of Planning and Infrastructure's Potential Home Sites Program in March 2013, being seen as a 'strategic fit' in terms of planned growth and urban policy. Whilst the site was seen as a 'strategic fit', lack of enabling services and long lead in times and fragmented ownership posed a challenge for delivery. This has now been remedied with agreements to purchase 86% of the site and 'in principal' support with Sydney Water in relation to forward funding enabling services.

There are sound planning reasons to support the rezoning of Box Hill North at this time when investment certainty, housing affordability and land supply are key issues of concern at the national, state and regional level. The successful development of Box Hill North will assist in meeting State government policy to release as much land to the market as quickly as possible. The project is consistent with and will assist in the delivery of key outcomes of the NSW State Plan and the North West Sub-Regional Strategy by contributing to the supply to market of appropriately located land to sustainably accommodate the projected housing and employment needs of the region's population and The Hills Shire which is required to provide 21,500 dwellings by 2031.

The Planning Proposal will deliver a range of densities, lot sizes and dwelling types and create a diverse community that is demographically balanced. The variety of housing forms will provide opportunities to respond to changing life cycle, lifestyle and work requirements over time, enabling people to age in place.

As demonstrated throughout the planning proposal, the proposed development will not result in any significant adverse environmental, social or economic impact. Environmental impacts with respect to flora and fauna, transport and accessibility, bushfire, contamination, social and community impacts, utility servicing, and Indigenous heritage are demonstrated to be appropriately managed.

The planning proposal presents a biodiversity strategy that will secure the conservation of selected native vegetation on the site and provide a commitment to undertake re-vegetation and improvement works of retained areas of native vegetation though the preparation and implementation of vegetation management plans. The proposal also recognises that additional off site offsets are to be purchased to compensate for the loss of remanent vegetation, namely the purchase BioBanking biodiversity credits, the quantum and type to be determined via a BioBanking assessment.

The background reporting has concluded that there are no contamination issues that would prevent the planning and urban development of the site for the proposed uses, consistent with the objectives of State Environmental Planning Policy No. 55 – Remediation of Land.

Four Aboriginal archaeological sites were identified in the study area, of which one site BHN 1 (the grinding groove site) in accordance with the significance assessment criteria established in the Australia ICOMOS Burra Charter, 1999 (Australia ICOMOS 1999) is considered to be of high significance. The remaining Aboriginal archaeological sites BHN 2 and BHN 3 (open artefact scatter) and BHN 4 (isolated find) have moderate significance. The proposal retains two of the four sites within an open space corridor (BHN1 and BHN 4) and partially impacts on the remaining two sites (BHN 2 and 3), however the aboriginal heritage assessment has concluded that the impact to these site does not pose a constraint to the development of Box Hill North.

The future redevelopment of Box Hill North will not result in any significant adverse traffic or transport impact on the surrounding local and regional road network. This will be achieved through the carrying out of a number of road works including intersection works, road upgrades and traffic management.

The proposed Water Cycle and Flood Management Strategy provides a basis for the detailed design and development of the site to ensure that the environmental, urban amenity, engineering and economic objectives for stormwater management and site discharge are achieved. The water cycle management strategy delivers the required technical performance; lessens environmental degradation and pressure on downstream ecosystems and infrastructure; and provides for a 'soft' sustainable solution for stormwater management within the release area. Provision of the proposed water quality treatment devices within the development will ensure that the post development stormwater discharges will meet the Office of Environment and Heritage's Stream Erosion Index and water quality targets. Hydrologic modelling for the site indicates that inclusion of the proposed detention basins within the site will attenuate peak post development flows to less than existing levels. The detailed flood assessment completed for the strategy has demonstrated that flood levels on the creeks with and without development has shown that urbanisation will result in only minor increases in flood levels outside the site boundary.

The Planning Proposal is supported by viable infrastructure servicing strategy that leverages readily accessible existing infrastructure and demonstrates that the project can be implemented as a standalone proposal. In regard to services, Box Hill North will require the construction of a new Sewage Pumping Station. Sydney Water is currently undertaking extensions to the trunk sewerage infrastructure within the Chain-of-Ponds Creek system that includes a large diameter sewer carrier from near Boundary Road to Vineyard and thence via a new SPS to Riverstone West Wastewater Treatment Plant (WWTP). Sydney Water has confirmed that their current extension works to the trunk sewerage infrastructure within the Chain-of-Ponds Creek system can accommodate the proposed development of the Box Hill North Precinct with the provision of the new sewerage pumping station. Sydney Water has confirmed that the bulk potable water supply to the site can occur from the Rouse Hill Elevated Reservoir, while local supply may require a new reservoir close to the site. Construction and planning of the new Surface Reservoir and Supply Main will be undertaken directly with Sydney Water and the developer of the site. Utility providers Endeavour Energy, Jemena and NBN Co have confirmed that the site can be serviced with regard to electricity, gas and telecommunications, respectively. Therefore, there are currently no infrastructure or servicing hurdles that could preclude the urban development of the Box Hill North precinct, which is capable of delivering the first residential lots in 2016.

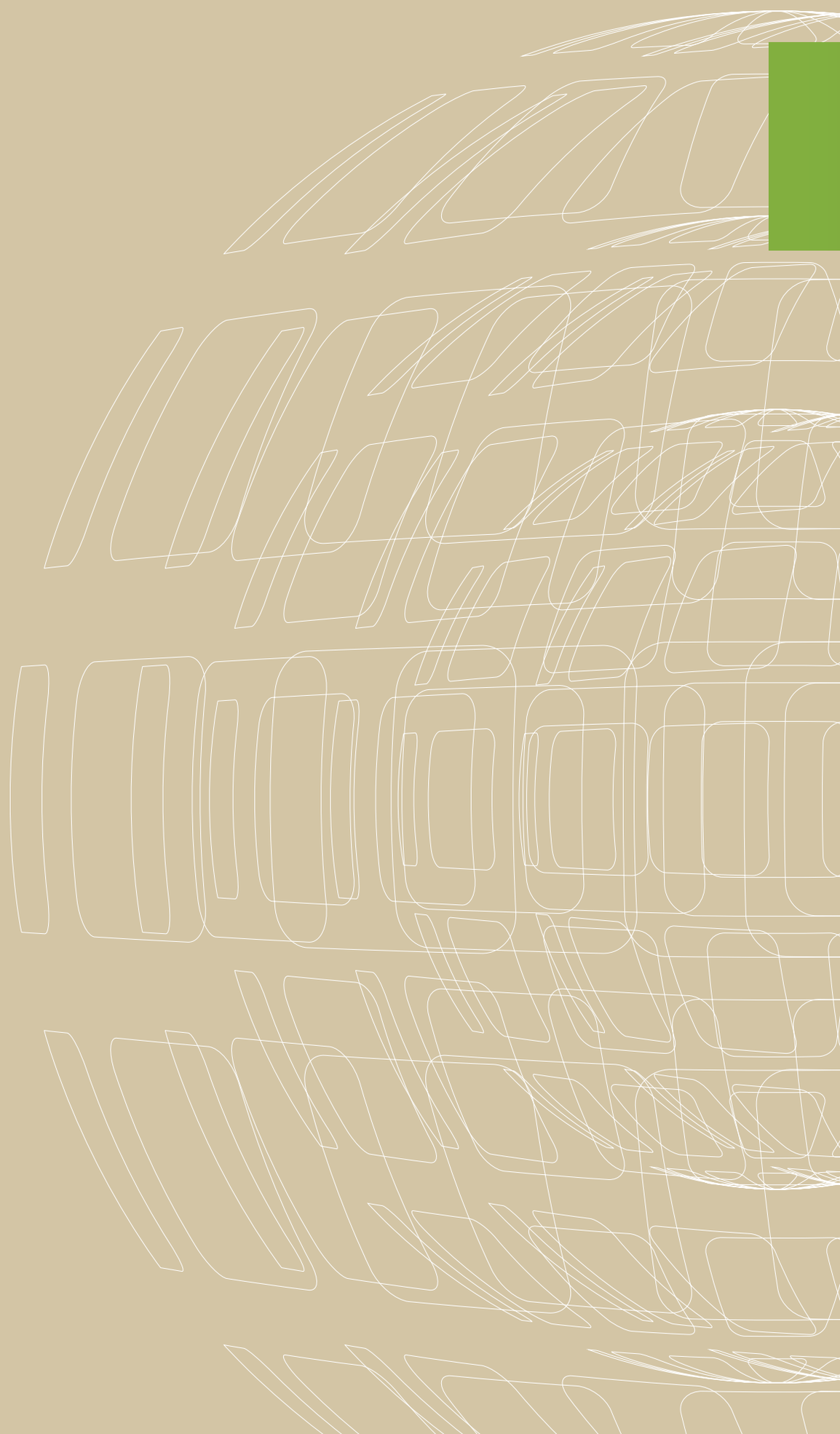
The Planning Proposal has a number of positive environmental, social and economic benefits and it is worthy of Council's support. It is recommended that Council forward the Planning Proposal to the DoPI for the Gateway Approval process to amend the provisions of The Hills LEP 2012 under section 54(2) of the *Environmental Planning and Assessment Act, 1979*.

SECTION 10.

Appendices

APPENDIX A.

Summary of Consultation



15 July 2013

NSW Heath
Ambulance Service of NSW
Western Sydney & Nepean Blue Mountains Region Sector
Level 1, 668 High Street
Penrith NSW 2750

Attention: Ray Creen – Chief Executive

Dear Ray

BOX HILL NORTH
PLANNING PROPOSAL

We are writing to you on behalf of E. J. Cooper and Son Pty Ltd (the proponent) in relation to a 380 hectare parcel of land at Box Hill North (the site) (refer to location plan attached). The site is located to the immediate north of the recently rezoned Box Hill and Box Hill Industrial Precincts (9,600 homes and 29,000+ residents, employment and social infrastructure).

The purpose of this letter is to advise of our proposal to The Hills Shire Council (the Council) to rezone and develop Box Hill North for a new residential community, which once developed will allow for:

- approximately 4,000 + dwellings;
- a neighbourhood village (indicatively 10,000m^2 of retail floor space);
- new roads and physical utilities infrastructure;
- open space and riparian corridor network; and
- social infrastructure.

An Indicative Layout Plan is also attached. It will comprise a formal amendment to The Hills Local Environmental Plan 2012 via the Gateway process. The planning proposal is to be submitted to Council at the end of July 2013.

Should you have any comments, please do not hesitate to contact either Elise Crameri on 9956 1295. Council has appointed a designated contact for this proposal being Bronwyn Smith who can be contacted on 9843 0269 should you seek further information.

Yours sincerely

Allison Smith
Project Director – APP Corporation

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15 July 2013

NSW Government
Department of Education and Communities
GPO Box 33
Sydney NSW 2001

Attention: Martin Karm, Statutory Planner

Dear Martin

BOX HILL NORTH
PLANNING PROPOSAL

Thank you for meeting with Elton Consulting on 4 July 2013 in relation to Box Hill North.

As you are aware E.J. Cooper and Son Pty Ltd (EJC) propose to lodge a planning proposal at the end of July 2013 to The Hills Shire Council (the Council). The proposal is to seek an amendment to The Hills Local Environmental Plan 2012 via the Gateway process to rezone land to allow for a new residential community which, once developed, will allow for:

- approximately 4,000 + dwellings;
- neighbourhood village (indicatively 9,000m^2 of retail floor space);
- new roads and physical utilities infrastructure;
- open space and riparian corridor network; and
- social infrastructure including one primary school.

An Indicative Layout Plan is attached. The plan has been guided by technical investigations including environmental (flora and fauna, aboriginal archaeology, bushfire), engineering, traffic and transport and social planning.

Should you have any comments, please do not hesitate to contact either myself on 0407 120 969 or Bronwyn Smith of Council on 9843 0269. Bronwyn will be responsible for managing the planning proposal for Council.

Yours sincerely

per

Allison Smith
Project Director – APP Corporation

APP Corporation Pty Ltd
ABN 29 003 764 770
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North Sydney NSW 2060

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www.app.com.au

15 July 2013

The General Manager
Hawkesbury City Council
PO Box 146
Windsor NSW 2756

Attention: Peter Jackson

Dear Sir

BOX HILL NORTH
PLANNING PROPOSAL

We are writing to you on behalf of E. J. Cooper and Son Pty Ltd (the proponent) in relation to a 380 hectare parcel of land at Box Hill North (the site) (refer to location plan attached). The site is located to the immediate north of the recently rezoned Box Hill and Box Hill Industrial Precincts (9,600 homes and 29,000+ residents, employment and social infrastructure).

The site was identified as a 'strategic investigation site' as part of the Department of Planning and Infrastructure's Potential Home Sites Program (March 2013), being seen as a 'strategic fit' in terms of planned growth and urban policy.

The purpose of this letter is to advise of our proposal to rezone and develop Box Hill North (via the Gateway process, for a new residential community, which, once developed, will allow for:

- approximately 4,000 + dwellings;
- a neighbourhood village (indicatively 9,000m^2 of retail floor space);
- new roads and physical utilities infrastructure;
- open space and riparian corridor network; and
- social infrastructure.

A draft Indicative Layout Plan is attached. The plan has been guided by technical investigations including environmental (flora and fauna, aboriginal archaeology, bushfire), engineering, traffic and transport and social planning. It is EJC's intention to lodge the planning proposal at the end of July 2013 to The Hills Shire Council (the Council).

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Should you have any comments, please do not hesitate to contact either Elise Crameri on 9956 1295. Council has appointed a designated contact for this proposal being Bronwyn Smith who can be contacted on 9843 0269 should you seek further information.

Yours sincerely

per Elise Crameri

Allison Smith
Project Director – APP Corporation

15 July 2013

NSW Police Force
The Hills Local Area Command
Corner Castle and Pennant Streets
CASTLE HILL NSW 2154

Dear Sir / Madam

BOX HILL NORTH
PLANNING PROPOSAL

We are writing to you on behalf of E. J. Cooper and Son Pty Ltd (the proponent) in relation to a 320 hectare parcel of land at Box Hill North (the site) (refer to location plan is attached). The site is located to the immediate north of the recently rezoned Box Hill and Box Hill Industrial Precincts (9,600 homes and 29,000+ residents, employment and social infrastructure).

The purpose of this letter is to advise of our proposal to rezone and develop Box Hill North for a new residential community, which once developed will allow for:

- approximately 4,000 + dwellings;
- a neighbourhood village (indicatively 9,000m^2 of retail floor space);
- new roads and physical utilities infrastructure;
- open space and riparian corridor network; and
- social infrastructure.

An Indicative Layout Plan is attached. The proposal will comprise a formal amendment to the Hill Local Environmental Plan 2012 via the Gateway process. The planning proposal is to be submitted to The Hills Shire Council (the Council) at the end of July 2103

Should you have any comments, please do not hesitate to contact either Elise Crameri on 9956 1295. Council has appointed a designated contact for this proposal being Bronwyn Smith who can be contacted on 9843 0269 should you seek further information.

Yours sincerely

pp Elise Crameri

Allison Smith
Project Director – APP Corporation

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www.app.com.au

15 July 2013

Transport NSW
Roads and Maritime Services
PO Box 973
Parramatta NSW 2124

Attention: Owen Hodgson, Senior Land Use Planner, Transport Planning Section, Sydney Region

Dear Owen

BOX HILL NORTH
PLANNING PROPOSAL

Thank you for meeting with APP on 6 June 2013. As you are aware E.J.Cooper and Son Pty Ltd (EJC) propose to lodge a planning proposal in July 2013 to The Hills Shire Council (the Council). The proposal is to seek an amendment to the Hill Local Environmental Plan 2012 via the Gateway process to rezone land to allow for a new residential community which, once developed, will allow for:

- approximately 4,000 + dwellings;
- neighbourhood village (indicatively 9,000m^2 of retail floor space);
- new roads and physical utilities infrastructure;
- open space and riparian corridor network; and
- social infrastructure.

An Indicative Layout Plan is attached. The site is located to the immediate north of the recently rezoned Box Hill and Box Hill Industrial Precincts (9,600 homes and 29,000+ residents, employment and social infrastructure. As discussed with you, our strategy in relation to traffic and transport is to:

- look at (both Box Hill North and Box Hill and Box Hill Industrial sites holistically in terms of traffic and transport;
- identify external road network improvements (i.e. road widening, provision of clearways, intersection upgrades including those along Windsor Road) arising as a result of concurrent redevelopment of both sites. It is the proposition of EJC to fund the apportioned share of the Windsor Road (and other) intersections as a result of Box Hill North traffic flows; and
- examine opportunities to extend public transport within Box Hill North.

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www.app.com.au

Should you have any comments, please do not hesitate to contact either Elise Crameri on 9956 1295. Council has appointed a designated contact for this proposal being Bronwyn Smith who can be contacted on 9843 0269 should you seek further information.

Yours sincerely

pp Allison Smith

Allison Smith
Project Director – APP Corporation

15 July 2013

Sydney Water Corporation
PO Box 399
Parramatta NSW 2124

Attention: Adrian Miller – Manager, Growth Strategy

Dear Adrian

BOX HILL NORTH
PLANNING PROPOSAL

Thank you for meeting with APP on 6 June 2013 and also at the Government Agency workshop convened by Department of Planning and Infrastructure (DoPI) on 28 June 2013.

As you are aware E.J. Cooper and Son Pty Ltd propose to lodge a planning proposal in July 2013 to The Hills Shire Council (the Council). The proposal is to seek an amendment to the Hills Local Environmental Plan 2012 via the Gateway process to rezone land to allow for a new residential community which, once developed, will allow for:

- approximately 4,000 + dwellings;
- neighbourhood village (indicatively 9,000m^2 of retail floor space);
- new roads and physical utilities infrastructure;
- open space and riparian corridor network; and
- social infrastructure.

An Indicative Layout Plan is attached. The applicable rezoning, infrastructure and administration costs including forward funding of Sydney Water infrastructure for the development is intended to be met through Voluntary Planning Agreements and/or other arrangements as appropriate. As previously advised the water and waste water servicing strategy comprises:

In relation to water:

- provision of a new Surface Reservoir at Oakville (i.e. existing Sydney Water site);
- supply main from existing Rouse Hill Reservoir (Cudgegong Road) (option to "take off" from existing main); and
- potential Booster/Transfer Pump along main (subject to design requirements).

In relation to sewer:

- provision of new sewerage pumping station at Maguires Road (site to be confirmed in design process);
- rising main from SPS to Sydney Water Package 2 Chain-Of-Ponds Carrier along Maguires Road and Boundary Road (to Vineyard SPS and Riverstone West WWTP); and
- potential for interim/temporary SPS and rising main to suit development staging.

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Should you have any further comments, please do not hesitate to contact either Elise Crameri on 9956 1295. Council has appointed a designated contact for this proposal being Bronwyn Smith who can be contacted on 9843 0269 should you seek further information.

Yours sincerely

per Elise Crameri

Allison Smith
Project Director – APP Corporation

15 July 2013

Transport for NSW
PO Box K659
Haymarket NSW 1240

Attention: Anissa Levy

Dear Anissa

BOX HILL NORTH
PLANNING PROPOSAL

Thank you for meeting with APP at the Government Agency workshop convened by Department of Planning and Infrastructure (DoPI) on 28 June 2013 in relation to a 380 hectare parcel of land at Box Hill North (the site) (refer to location plan attached). The site is located to the immediate north of the recently rezoned Box Hill and Box Hill Industrial Precincts (9,600 homes and 29,000+ residents, employment and social infrastructure).

The site was identified as a 'strategic investigation site' as part of the Department of Planning and Infrastructure's Potential Home Sites Program (March 2013), being seen as a 'strategic fit' in terms of planned growth and urban policy.

As you are aware, E. J. Cooper and Son Pty Ltd (EJC) propose to lodge a planning proposal at the end of July 2013 to The Hills Shire Council (the Council). The proposal is to seek an amendment to The Hills Local Environmental Plan 2012 via the Gateway process to rezone land to allow for a new residential community which, once developed, will allow for:

- approximately 4,000 + dwellings;
- a neighbourhood village (indicatively 10,000m^2 of retail floor space);
- new roads and physical utilities infrastructure;
- open space and riparian corridor network; and
- social infrastructure.

An Indicative Layout Plan is also attached. The plan has been guided by technical investigations including environmental (flora and fauna, aboriginal archaeology, bushfire), engineering, traffic and transport and social planning.

As discussed with the Roads and Maritime Services on 6 June 2013, our strategy in relation to traffic and transport is to:

- look at (both Box Hill North and Box Hill and Box Hill Industrial sites holistically in terms of traffic and transport;
- identify external road network improvements (i.e. road widening, provision of clearways,

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intersection upgrades including those along Windsor Road) arising as a result of concurrent redevelopment of both sites; and

- examine opportunities to extend public transport within Box Hill North.

Should you have any comments, please do not hesitate to contact either Elise Crameri on 9956 1295. Council has appointed a designated contact for this proposal being Bronwyn Smith who can be contacted on 9843 0269 should you seek further information.

Yours sincerely

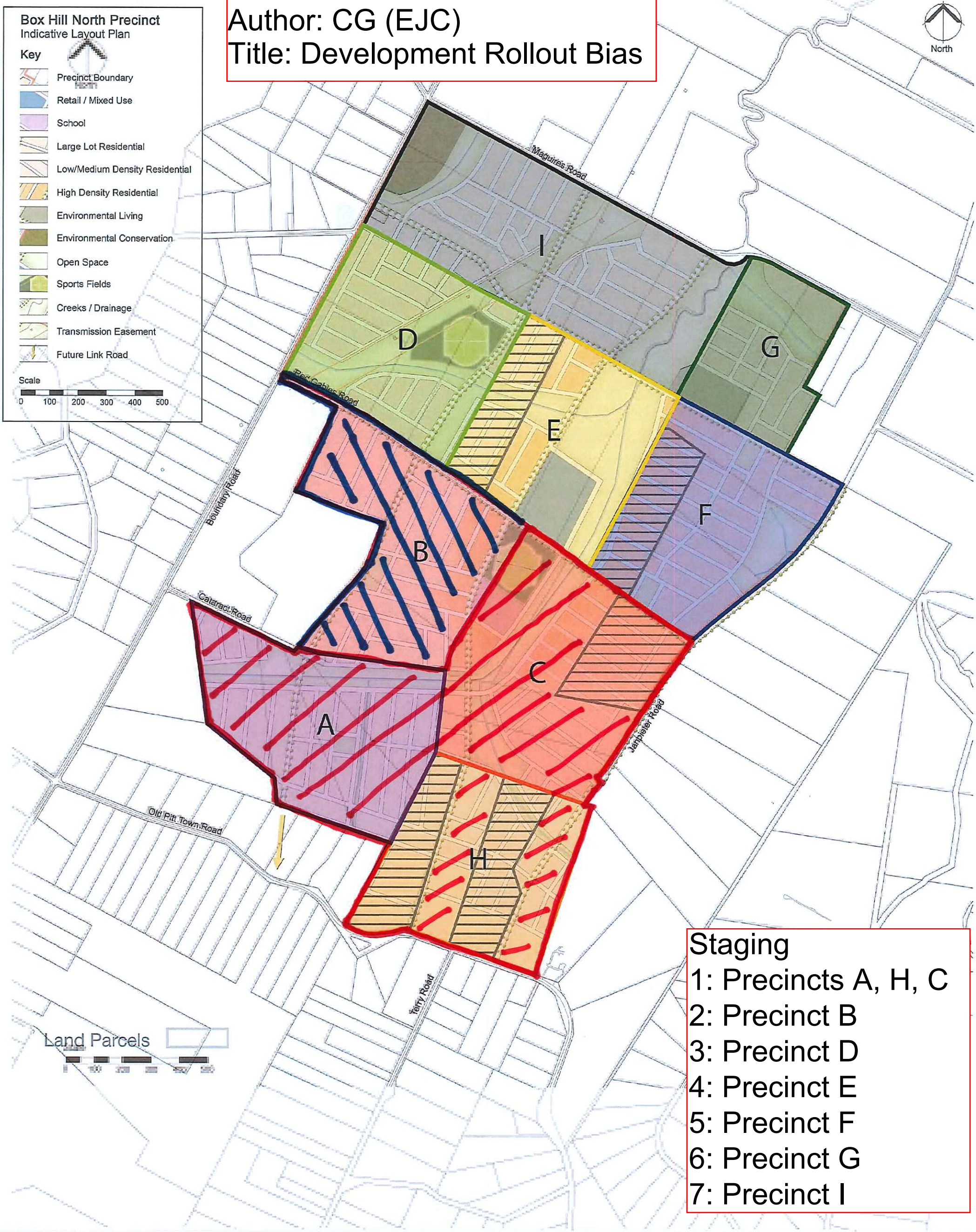
Allison Smith
Project Director – APP Corporation

Box Hill Water

3.5.1(a) Planning Proposal for the Development

Box Hill North

Project: Box Hill North
Date: 2014-11-24
Author: CG (EJC)
Title: Development Rollout Bias



Staging
1: Precincts A, H, C
2: Precinct B
3: Precinct D
4: Precinct E
5: Precinct F
6: Precinct G
7: Precinct I

design iQ
shaping the urban canvas

Box Hill North Indicative Layout Plan

30072013- Rev 5

Box Hill Water

Appendix 3.5.1(b) Gazettal of LEP Amendment

New South Wales

The Hills Local Environmental Plan 2012 (Amendment No 22)

under the

Environmental Planning and Assessment Act 1979

I, the Minister for Planning, make the following local environmental plan under the *Environmental Planning and Assessment Act 1979*.

MARCUS RAY
As delegate for the Minister for Planning

Published LW 20 February 2015 (2015 No 80)

The Hills Local Environmental Plan 2012 (Amendment No 22)

under the

Environmental Planning and Assessment Act 1979

1 Name of Plan

This Plan is *The Hills Local Environmental Plan 2012 (Amendment No 22)*.

2 Commencement

This Plan commences on the day on which it is published on the NSW legislation website.

3 Land to which Plan applies

This Plan applies to certain land in an area known as Box Hill North to which *The Hills Local Environmental Plan 2012* applies.

4 Maps

The maps adopted by *The Hills Local Environmental Plan 2012* are amended or replaced, as the case requires, by the maps approved by the Minister on the making of this Plan.

Box Hill Water

3.5.1(c) REF Executive Summary for the Reticulation Network

REF for Proposed Sewage and Recycled Water Reticulation Systems

Box Hill North Precinct, New South Wales

Executive Summary Report

Prepared by:

RPS AUSTRALIA EAST PTY LTD

241 Denison Street
Broadmeadow NSW 2292
PO Box 428 Hamilton NSW 2303

Client Manager: Rob Dwyer
Report Number: 125542
Version / Date: Version 1 / April 2015

Prepared for the proponent:

FLOW SYSTEMS OPERATIONS PTY LTD TRADING AS BOX HILL NORTH WATER (A WHOLLY-OWNED SUBSIDIARY OF FLOW SYSTEMS PTY LTD)

Level 2, 1 Alfred Street
Sydney NSW, 2000

Executive Summary

The Proposal

Flow Systems Operations Pty Ltd, trading as Box Hill North Water (a wholly owned subsidiary of Flow Systems Pty Ltd herein referred to as Box Hill North Water) is proposing to construct and operate a pressure sewage reticulation system and a drinking water reticulation system (the proposal) at Box Hill North. The sewage and drinking water reticulation systems will be located on land controlled by EJC Developments Pty Ltd (EJC). The proposal will be operated and maintained by Box Hill North Water in conjunction with the proposed Box Hill North Local Water Centre (LWC) which will be located on Lot 10 DP 593517, Red Gables Road, Box Hill North.

The proposal involves the installation and operation of a pressure sewage reticulation system, including the installation and operation of interim sewage servicing tanks within the EJC controlled lands of the Box Hill North Precinct. The proposal also includes the installation and operation of a recycled water reticulation system throughout the same area delivering high quality recycled water (non-potable uses such as toilet flushing, washing machines, gardens, and car washing) back to the new residential areas. The two systems will ultimately service around 4,100 residential lots and some ancillary facilities.

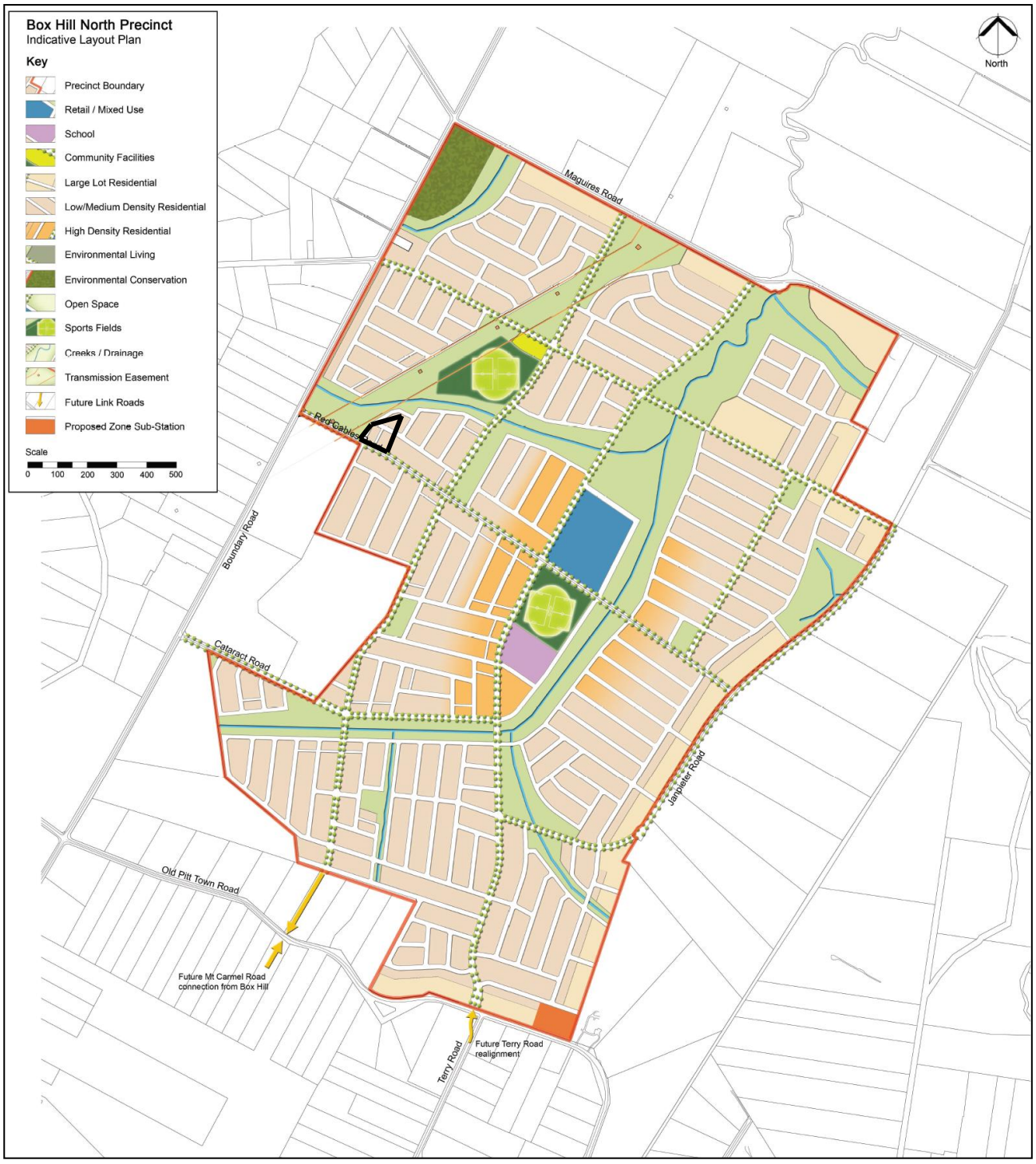
A plan showing the location of the Box Hill North Precinct and its proposed residential and street layout is shown in **Figure 1**. A concept master plan for the recycled water reticulation system is contained in **Appendix 1**. Likewise **Appendix 1** contains a concept master plan for the sewage reticulation system, a site plan of the proposed LWC indicating the location of the interim sewage servicing tanks and a perspective illustration of the interim sewage servicing tanks.

The installation of the sewer and recycled water systems will occur simultaneously with the staged development of the Box Hill North Precinct. New residential development requires the co-ordinated provision of sewage reticulation systems. The proposal and the development of the LWC (under separate approval) are seen as the best system for the Box Hill North Precinct because the off-site impacts are limited.

Statutory and planning framework

The Review of Environmental Factors (REF) has been prepared to provide the Independent Pricing and Regulatory Tribunal (IPART) and the NSW Minister for Natural Resources, Lands and Water, with information to the fullest extent possible of all matters affecting, or likely to affect, the environment by the construction and operation of the reticulations systems. The proposal does not require development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP& A Act) pursuant to *State Environmental Planning Policy (Infrastructure) 2007*. Therefore the proposal is the subject of environmental assessment under Part 5 of the EP&A Act. The proposal also requires environmental assessment pursuant to the environmental licensing principles of the *Water Industry Competition Act 2006* (WICA) and the *Water Industry Competition (General) Regulation 2008*. This document is an executive summary of the REF prepared for the environmental assessment.

Figure 1 Box Hill North Precinct – subject of the Review of Environmental Factors



Box Hill North LWC Site

Environmental Impacts

The REF provides a detailed description of the potential environmental impacts associated with the proposal, during both construction and operation, and these include impacts associated with the:

- Removal of vegetation;
- Potential for the identification of Aboriginal and non-Aboriginal heritage;
- Potential for erosion;
- Potential for increase in noise;
- Air Quality and odour;
- Increase in traffic movements; and
- Potential for the generation of waste during the construction phase.

Noise Impacts

The existing area surrounding the proposal site is predominantly rural-residential in nature. Residential areas are currently located within the urban confines of Box Hill and Oakville. The main source of noise will be construction noise. Noise will be from machinery associated with any clearing of vegetation required (this will likely be carried out prior to works for this proposal) and earthworks. Due to the nature of the plant and equipment (relatively small scale) that will be used during construction the noise level during construction is unlikely to have an adverse impact on residential receivers.

Another source of noise emission will be from tanker trucks attached to the interim sewage servicing tanks on the LWC site. A Noise Impact Assessment of the interim sewage servicing tanks and the fully operational LWC has been carried out. When the interim sewage servicing tanks are at full capacity (noting it will take time to build up to this as houses are built and connect), there will be up to six tankers visiting the site per day for up to an hour each, and for 7 days per week and potentially sometimes at night. By the time residential development approaches to near the LWC site the interim sewage servicing tanks will have been decommissioned and the LWC commissioned. The Noise Impact Assessment recommends, if existing residences near the interim sewage servicing tanks remain, shielding of the interim sewage servicing tanks by movable temporary screens when the tanks are being emptied.

Odour and Air Quality

An Odour Impact Assessment having due consideration for the NSW Environmental Protection Authority guidelines was carried out as part of the REF. The Assessment included modelling of the impact of the odour control unit associated with the interim sewage servicing tanks located on the LWC site.

The predicted odour concentrations for the odour control unit show that the 2 OU or 99th percentile threshold (the theoretical level at which odour becomes detectable but not necessarily distinguishable), is not predicted beyond the boundary of the LWC site. The Assessment also notes that the odour control unit vent stack emissions are likely to be conservative.

The predicted odour concentrations for the odour control unit associated with the interim sewage servicing tanks are shown in **Figure 2**. Note that the figure plots the 1 OU odour concentration contour which is much less than the 2 OU concentration contour.

Figure 2 Predicted 99th percentile odour concentration for ISST

Box Hill North LWC Site

Mitigation Measures

The REF provides a large number of mitigation measures that will avoid or reduce the potential impacts of the proposal. These mitigation measures have been designed to minimise and or mitigate, as far as practical, the potential impacts. A summary of the mitigation measures are provided in **Table 1** below.

Table 1 Impact and Mitigation Measures for the proposed sewage, recycled water and drinking water reticulation systems at Box Hill North Precinct

Impact	Mitigation Measures
General	All contractors and machine operators will be inducted on the environmental sensitivities of the work site(s) and relevant safeguards.
Land Capability	Contamination assessments undertaken for each DA stage of subdivision.
Flora and fauna	The full extent of any vegetation clearance will be clearly documented and mapped in the site's CEMP. The CEMP will prepared by the construction contractor prior to the commencement of construction.
	The clearing extents are to be clearly demarcated with temporary fencing before commencement of works.
	Materials, plant and equipment will not be stored within the drip-lines of any trees at the site.
	To prevent damage to vegetation outside the boundaries of access tracks, vehicles and machinery will be restricted to designated work areas.
	Where access tracks run alongside areas of natural bushland, protective fencing or paraweb fencing is to be installed along the boundaries of the track to prevent vehicles from inadvertently entering/damaging bushland.
	Degradation or disturbance to areas of water-side (riparian) vegetation will be avoided to the greatest possible extent. Any such areas will be clearly identified in the CEMP.
	Where excavated soil is to be used in site restoration, it will be excavated and stockpiled in sequential layers corresponding to the existing soil profile. Topsoil and leaf litter is to be removed first and windrowed in separate stockpiles of less than 1m in height on the upslope side of excavations. Soil layers will be replaced sequentially so that the soil profile is restored as closely as possible to its pre-work status.
	All temporary erosion and sediment control devices such as silt-stop fencing will be removed from the site at the completion of the works or when the site is stabilised.
Heritage (Aboriginal and non-Aboriginal)	All relevant staff and contractors should be made aware of their statutory obligations for heritage under the *National Parks and Wildlife Act 1974* and the *Heritage Act 1977*, which may be implemented as a heritage induction.
	The Due Diligence Assessment for the Box Hill North LWC must be kept by the proponent so that it can be presented, if needed, as a defence from prosecution under s86 (2) of the *National Parks and Wildlife Act* 1974.
	If unrecorded Aboriginal object/s are identified on the site during works, then all works in the immediate area must cease and the area should be cordoned off. OEH must be notified by ringing the Enviroline 131 555, so that the site can be adequately assessed and managed.
	In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, OEH must be contacted by ringing the Enviroline 131 555. An OEH officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the relevant Aboriginal stakeholders before works recommence.
	If, during the course of development works, suspected historic cultural heritage material is uncovered, work should cease in that area immediately. The OEH (Enviroline 131 555) should be notified, and works are only to recommence when an approved management strategy has been developed.
Water quality management and	Sediment and nutrient controls will be implemented to reduce the impacts of stormwater, erosion and sedimentation on water quality. Specific erosion and sediment controls are to be contained

Impact	Mitigation Measures
stormwater	within the site CEMP.
	All erosion and sediment control measures will be established before excavation and vegetation clearance begins. Control measures are to remain in place until all surfaces have been fully restored and stabilised.
	Sediment and erosion control devices will be inspected regularly, maintained to ensure effectiveness over the entire duration of the project, and cleaned out before 30% capacity is reached.
	Mulch bunds up slope of the proposed disturbance areas.
	Coir logs at 15m centres within the proposed road side swales.
	Sediment fences down slope of all disturbed areas and material stockpile areas.
	Disturbed areas will be stabilised by revegetation within 10 days after completion of construction.
	Site disturbance will be minimised by containing machinery access to site areas required for approved construction works.
	Erosion potential would be limited by managing runoff fetches and velocities, with measures such as contour drains, silt fences and level spreaders
	Sediment filters such as silt fences, coir logs, or turf strips will be located downstream of disturbed areas.
	The storage and handling of fuels and chemicals shall comply with Australian Standard AS1940.
	No chemicals, fuels, and/or waste will be stored or collected for disposal within or adjacent to drainage lines or unsealed surfaces.
	A 'spill kit' will be kept on site at all times for potential chemical or fuel spills.
	Refuelling, fuel decanting and vehicle maintenance work will take place in a designated sealed and bunded area.
	An Incident Management Plan (IMP) will be prepared as part of the CEMP and will include a contingency plan and emergency procedures for dealing with the potential spillage of fuel or other environmental incidents that may occur on the work site. The IMP should also contain procedures dealing with the unexpected onset of rainfall during the work period.
	Drainage systems will be checked at regular intervals and maintained to ensure they are operating at full capacity (eg clearance of debris from drainage lines).
Noise	All equipment used will comply with AS2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites.
	Work and deliveries will only occur during the following times: Monday to Friday: 7am to 6pm, Saturday: 8am to 1pm with deliveries 8am to 6pm. No construction work or deliveries will occur on Sundays or public holidays.
	Regular and effective maintenance of all equipment, including vehicles moving on and off the site, will be conducted.
	Plant and equipment which is used intermittently will either be shut down in the intervening periods between works or throttled down to a minimum.
	Any portable equipment with the potential to create high levels of noise (e.g. compressors, generators) will only be selected for use if it incorporates effective noise control. This equipment should be located, where practical, so that natural ground barriers are between it and the nearest potentially affected receivers.
	If existing residences near the ISST remain occupied (refer to Receiver 3 and 4 identified within the Operational Noise Assessment (**Appendix 11**) for location) then they should be shielded from the tanker pump by movable temporary screens while the tanks are emptied. The temporary screens should be 2.1 metres high.
Odour	All vehicles and machinery will be fitted with approved exhaust systems to maintain exhaust emissions within accepted standards;
	Machinery and vehicles will not be left running or idling when not in use for long periods;

Impact	Mitigation Measures
	Odour or air pollutant emission complaints will be dealt with promptly and the source will be eliminated wherever practicable;
	All loads of excavated material, soil, fill and other erodible matter that are transported to or from the work site will be kept covered at all times during transportation and will remain covered until they are unloaded either for use at the work site, reuse or disposal at a OEH licensed waste disposal facility;
	All work sites, general work areas and stockpiles will be closely monitored for dust generation and watered down (with clean water) or covered (via seeding or tarpaulins) in the event of dry and/or windy conditions; and
	A flexible hose be connected to the odour control unit associated with the ISST to manage odour during loading.
Traffic and access	The Contractor will maintain a complaints register. Any complaints received will be responded to as soon as possible.
	A traffic control plan prepared by a suitably qualified person will be submitted for approval prior to commencement of work on the site.
Waste generation	All waste generated during the course of the works will be reused or removed from the work areas as soon as practicable and disposed of in accordance with the waste disposal safeguards.
	All vessels used for contaminated or hazardous waste should be sealed, labelled according to their contents, and stored within bunded areas until their removal from the work site.
	Any fuel, lubricant or hydraulic fluid spillages will be collected using absorbent material and the contaminated material disposed of at an OEH licensed waste depot.
	The work site will be left clean and free of debris and other rubbish at the end of works.
	All hazardous wastes on site will be removed and disposed in accordance with the state and national regulations and guidelines and best practice for the removal of these materials.
	The Contractor's recycling and reuse proposal will be detailed in the CEMP.
	Excess spoil material that cannot be reused on site will be utilised in the ongoing earthworks as part of the adjacent subdivision works.
	Green waste from vegetation clearing will be either chipped for reuse; retained for rehabilitation; or mulched and spread immediately after the trench has been covered to prevent encroachment by weed species and minimise erosion. NB: where mulched vegetation is to be used measures to prevent organic material entering the local waterway shall be installed.
	Off-cuts of piping and other construction material will be recycled where possible.
Amenity and public information	The Contractor will maintain a complaints register. Any complaints received will be responded to as soon as possible.
	Accurate public information signs will be displayed while work is in progress and maintained in presentable manner.

Conclusion

The proposal will result in minimal adverse effects upon the environment. The proposal will be built in conjunction with the civil works associated with the approved subdivisions of the Box Hill North Precinct. Following the assessment of potential environmental impacts, through the work of various specialists, the REF demonstrates that the proposal will result in no impact beyond relevant guidelines and legislation.

Various minor environmental impacts have been identified in the REF and these are generally temporary in nature. Specifically, it is unlikely that the proposal will have a significant impact on threatened species, populations and ecological communities listed pursuant to the *Threatened Species Conservation Act 1995* or impact on matters of National Environmental Significance pursuant to the *Environment Protection and Biodiversity Conservation Act 1999.* There are no long term adverse effects created by the construction of the proposal. The mitigation measures contained within the REF, which will be implemented, will avoid or reduce the potential impacts of the proposal.

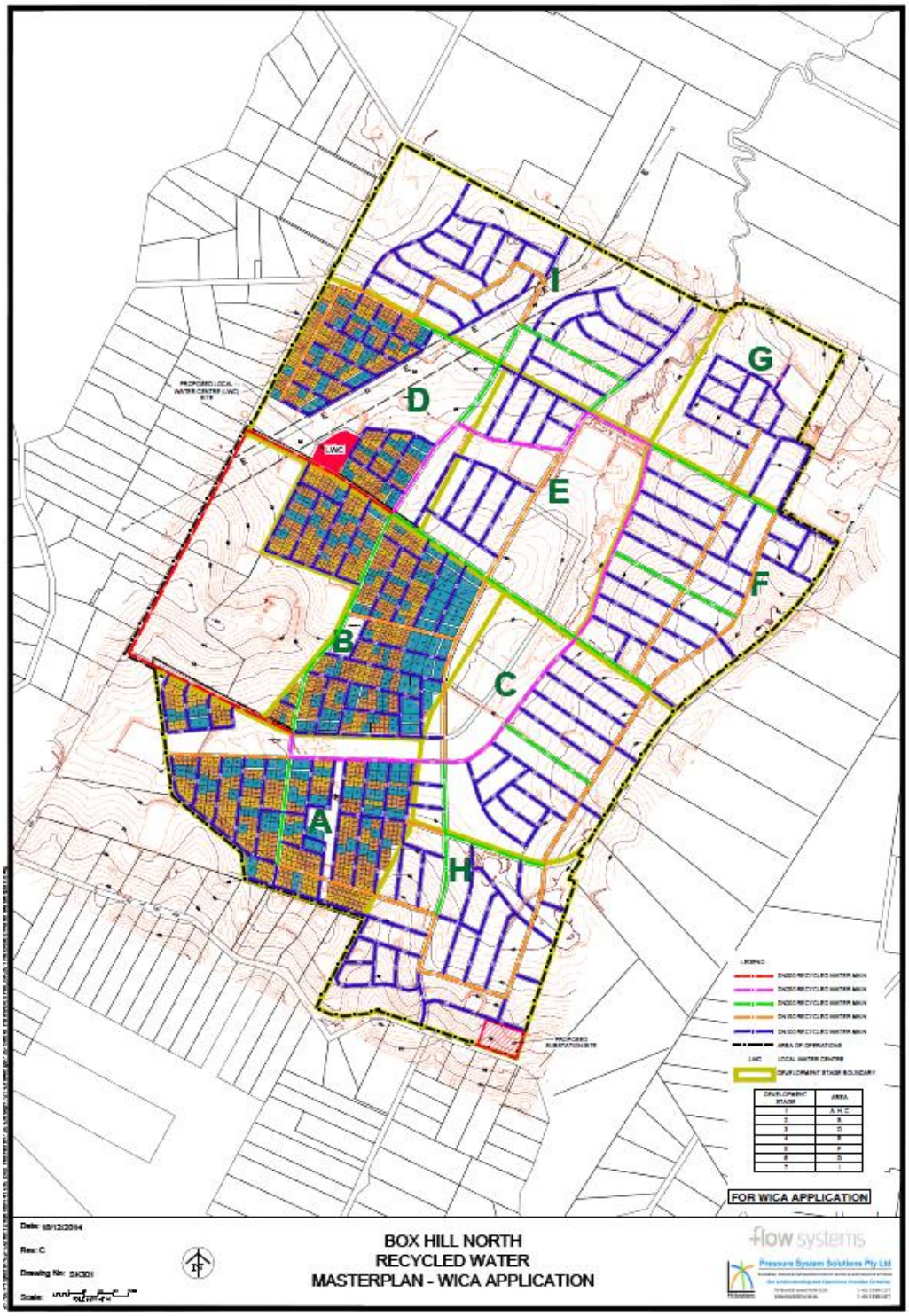
In addition, the proposal is unlikely to present a significant risk of harm to the environment and approval of network operator's licence under the *Water Industry Competition Act 2006* and the *Water Industry Competition (General) Regulation 2008* would be in the public interest.

The proposal will provide a service essential for the development of the Box Hill North Precinct which greatly benefits the community by ensuring supply of affordable housing for North-West Sydney and provide recycled water to the new development. This construction will benefit the current and future community in providing ready access to sewage disposal and recycled water schemes that make a significant contribution to sustainability.

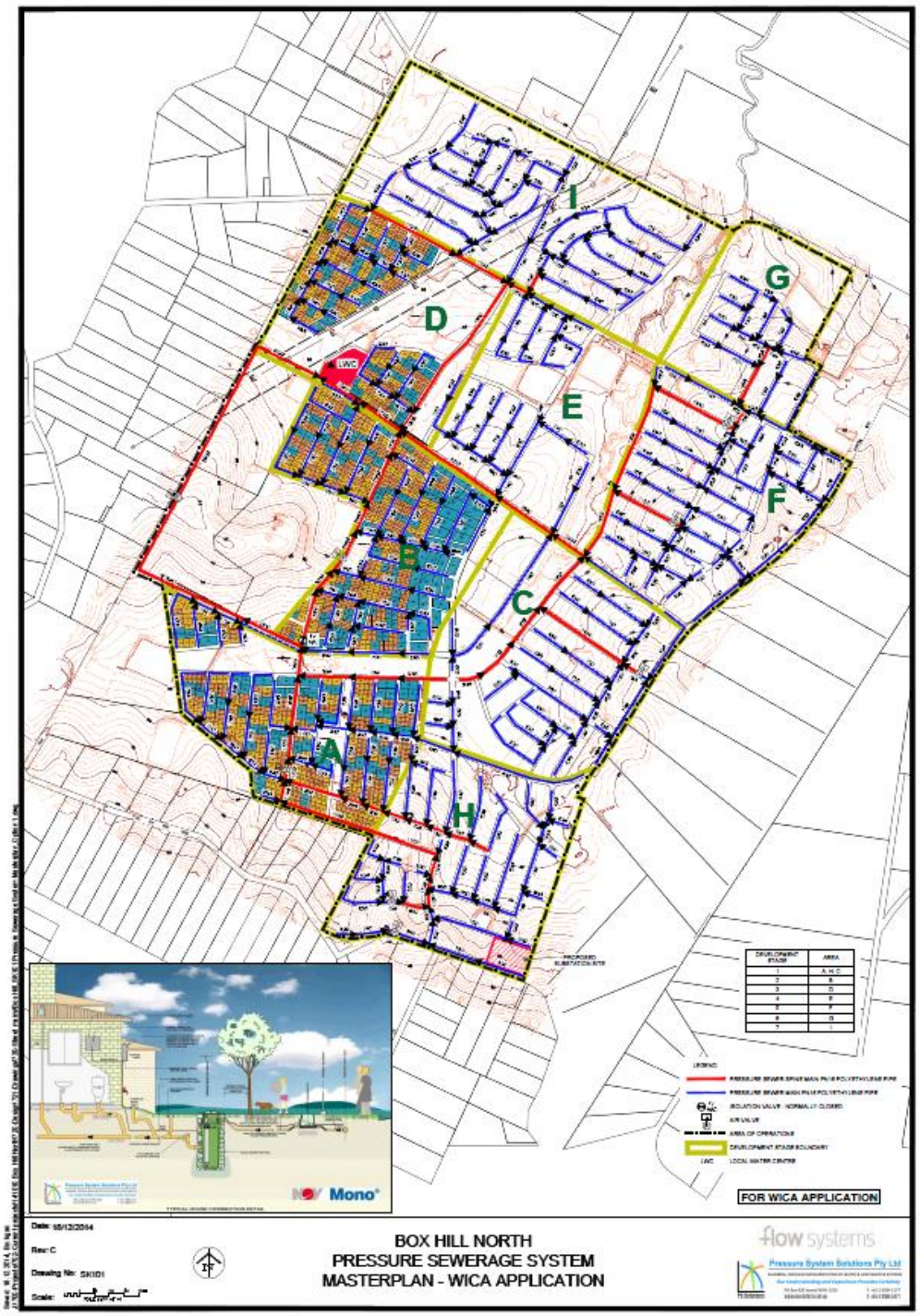
Appendix 1

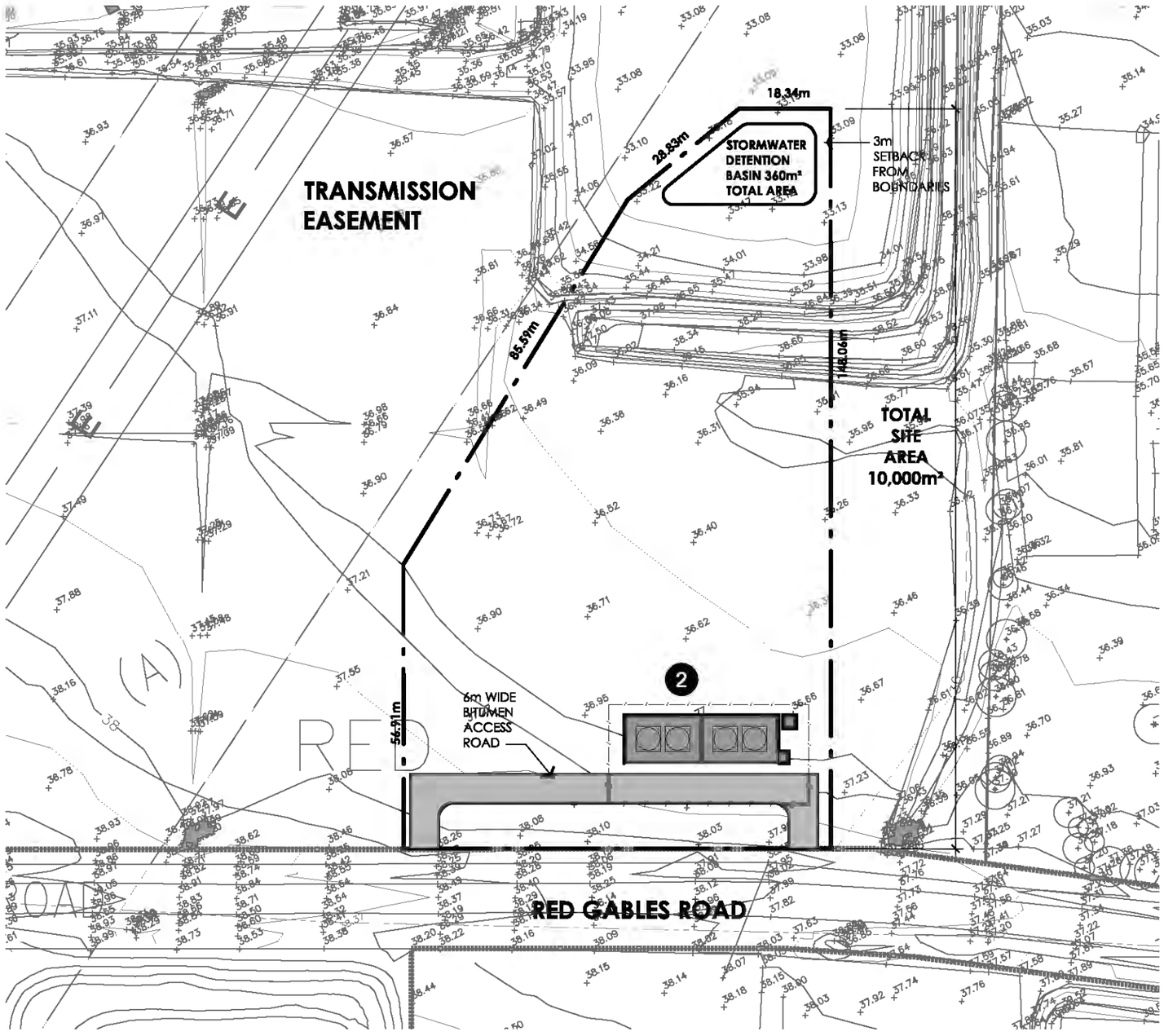
Concept Master Plans, LWC site plan and perspective illustration

Recycled Water Master Plan



Sewage Reticulation Master Plan





STAGE 1 WORKS

2 INTERIM STORAGE TANKS

STORMWATER DETENTION BASIN

NOT FOR CONSTRUCTION

NO.	DATE	DRAFTER	DESIGN	MGMT	DESCRIPTION
2	17.03.15	VC	AC	**	ISSUED FOR REVIEW
1	23.12.14	GO	AC	**	ISSUED FOR REVIEW

1:1 SHEET PRINT SCALE

PERMEATE PARTNERS
E: Info@permeate.com.au
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CLIENT: flow systems

NAME:	BOX HILL NORTH			TITLE:	STAGE 1 PLAN
PROJECT:	LOCAL WATER CENTRE			SCALE	PERMEATE PROJECT # C14121 / PERMEATE DRAWING # C14121-111
Design	Date	Drafting	Date		
AJC	18-Mar-15	MDP	18-Mar-15	SHEET A3	CLIENT PROJECT # TBA / CLIENT DRAWING # TBA

K:\2861-Permeate-Box Hill LWC (BN) GOWORKING\C14121-111 STAGE 1 PLAN.dwg

18/03/2015 11:29:28 AM, A3

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NO.	DATE	DRAFTER	DESIGN	MGMT	DESCRIPTION
D	01/08/14	AJC	AJC	-	FOR INFORMATION

CLIENT

Huntlee Water

NAME:	FLOW SYSTEMS			
PROJECT:	HUNTLEE			
Design	Date	Drafting	Date	

TITLE:	PROCESS AND INSTRUMENTATION DIAGRAM INTERIM STORAGE TANKS	
SCALE NTS	PERMEATE PROJECT # C14107	PERMEATE DRAWING # C14107 TANK LAYOUT 3D
SHEET A1	CLIENT PROJECT # -	CLIENT DRAWING # -

D:\Local Cloud\Shared\Internal\Production\Permeate Partners\J000013-Interim Storage Tanks Layout\Working Files\C14107 Tank Layout 3D.dwg

Box Hill Water

3.5.1(d) REF Executive Summary for the Water Recycling Facility

REF for Proposed Local Water Centre

Box Hill North Precinct, New South Wales

Executive Summary Report

Prepared by:

RPS AUSTRALIA EAST PTY LTD

241 Denison Street
Broadmeadow NSW 2292
PO Box 428 Hamilton NSW 2303

Client Manager: Rob Dwyer
Report Number: PR126988
Version / Date: April 2015

Prepared for the proponent:

FLOW SYSTEMS OPERATIONS PTY LTD TRADING AS BOX HILL NORTH WATER (A WHOLLY-OWNED SUBSIDIARY OF FLOW SYSTEMS PTY LTD)

Level 2, 1 Alfred Street
Sydney NSW, 2000

Executive Summary

The Proposal

Box Hill North Water (a wholly owned subsidiary of Flow Systems Pty Ltd herein referred to as Flow Systems) is proposing to construct and operate a water recycling facility at Box Hill North to facilitate the proposed residential subdivision development. The proposal will be known as the Box Hill North Local Water Centre (Box Hill North LWC).

The proposal will utilise sewage from the future residential area to produce high quality water. The sewage will be treated at the Box Hill North LWC through a multi-stage process of screening, anaerobic and aerobic processing, chemical treatment, membrane filtration, ultraviolet disinfection and chlorination. The refined water will be plumbed into houses for non-potable uses such as toilet flushing, washing machines, irrigation and car washing, thus reducing potable water demand. The facility, located upon Lot 10 DP 593517, Red Gables Road, within the Box Hill North residential subdivision, as illustrated in **Figure 1**, is intended to operate 24 hours, 7 days per week, housed in a low-scale, single level building within an open space setting. An architectural drawing of the proposal as it would appear once constructed is provided in **Figure 2.**

The proposal will provide an alternative to the traditional sewage treatment plant usually required to service new residential developments. Off-site impacts of the proposal are limited and because it is scalable it allows supply to increase in line with the anticipated residential development of Box Hill North and the volume of waste to be treated. The Box Hill North LWC will also make a significant contribution to sustainability through the provision of recycled water back to the new residential areas.

Prior to commissioning and operation of the Box Hill North LWC an interim arrangement for sewage disposal will be in place. This will utilise interim flow balance tanks to collect the sewage from the pressure sewerage network for subsequent collection by a licensed tankering contractor. The licensed tankering contractor will then transfer this raw sewage to an authorised receiving facility.

Statutory and Planning Framework

The Review of Environmental Factors (REF) for the Box Hill North LWC has been prepared to provide the Independent Pricing and Regulatory Tribunal (IPART) and the NSW Minister of Finance and Services, with information to the fullest extent possible of all matters affecting, or likely to affect, the environment by the construction and operation of the Box Hill North LWC. The proposal does not require development consent under Part 4 of the Environmental Planning and Assessment Act 1979 (EP& A Act) pursuant to *State Environmental Planning Policy (Infrastructure) 2007* and the proposed rezoning of the site to SP2 Infrastructure. Therefore the proposal is the subject of environmental assessment under Part 5 of the EP&A Act. This document is an executive summary of the REF prepared for the environmental assessment.

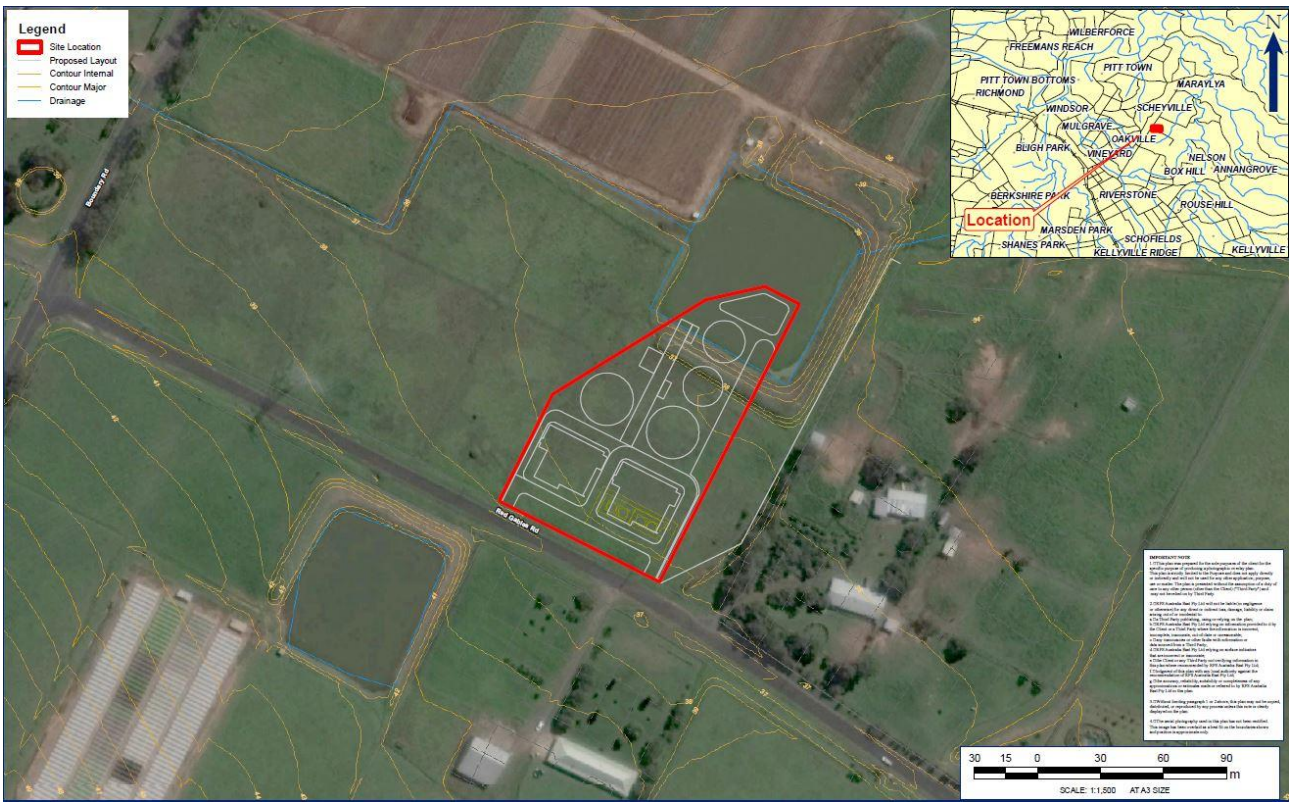


Figure 1 Location Plan

Figure 2 Architectural Drawing of the Box Hill North LWC

Environmental Impacts

The REF provides a detailed description of the potential environmental impacts associated with the proposal, during both construction and operation, and these include impacts associated with the:

- Application of recycled water around the Box Hill North residential development;
- Removal of vegetation and habitat for fauna;
- Potential for the identification of Aboriginal and non-Aboriginal heritage;
- Increase in hardstand areas and associated runoff;
- Potential for increase in noise;
- Air Quality and odour;
- Potential for Bushfires;
- Increase in traffic movements;
- Potential for changes to visual character; and
- Potential for the generation of waste during the construction phase.

Noise Impacts

Operational noise associated with the equipment within the Box Hill North LWC has been assessed against noise criteria set out in the NSW Environmental Protection Authority (EPA) NSW Industrial Noise Policy (INP). Noise monitoring to determine ambient noise was carried out as part of the specialist Noise Assessment contained within the REF and enabled the establishment of Project Specific Noise Criteria for daytime and night time operations. The noise monitoring and modelling used the $L_{Aeq,15min}$ criteria which is a common measure of environmental noise and road traffic noise. Criterion established were L_{Aeq} 41 dBA for day time and L_{Aeq} 41 dBA for night time. Under abnormal operating conditions involving the use of a back-up generator the INP allows for a positive adjustment of 5 dB to the criterion stated above.

Predicted noise levels from the proposed blowers and compressors room, recycled water pumps and potable water pumps indicate compliance with all criteria on all occasions at the closest identified noise sensitive receptors provided that a number of minor modifications to the building construction / treatment are implemented. The results of the modelling of the typical operation of the Box Hill North LWC with recommended mitigation measures in place are presented in graphical form as a contour map in **Figure 3**. The results of the modelling of the Box Hill North LWC under abnormal operating conditions involving the use of a back-up generator but with recommended mitigation measures in place are presented in graphical form as a contour map in **Figure 4.** Predicted noise levels from the back-up generator complies with the adjusted acceptable daytime noise level on all occasions except for a minor exceedance that may be found at the back corner of the nearest future residential lot.

Specific acoustic treatment for the Box Hill North LWC is contained within the mitigation measures which will be implemented during the Box Hill North LWC's construction and operation.

Odour and Air Quality

An Odour Impact Assessment having due consideration for the NSW Environmental Protection Authority guidelines was carried out as part of the REF. The odour impacts for the fully operational plant were assessed and modelling output is illustrated in **Figure 5.** Results from the dispersion modelling indicated that predicted odour concentrations from the proposed facility would comply with the most stringent assessment criterion of 2 OU (99th percentile) at all sensitive receivers outside the plant boundary.

Figure 3 Noise Modelling – Normal Operation Without Back-Up Generator and with recommended mitigation

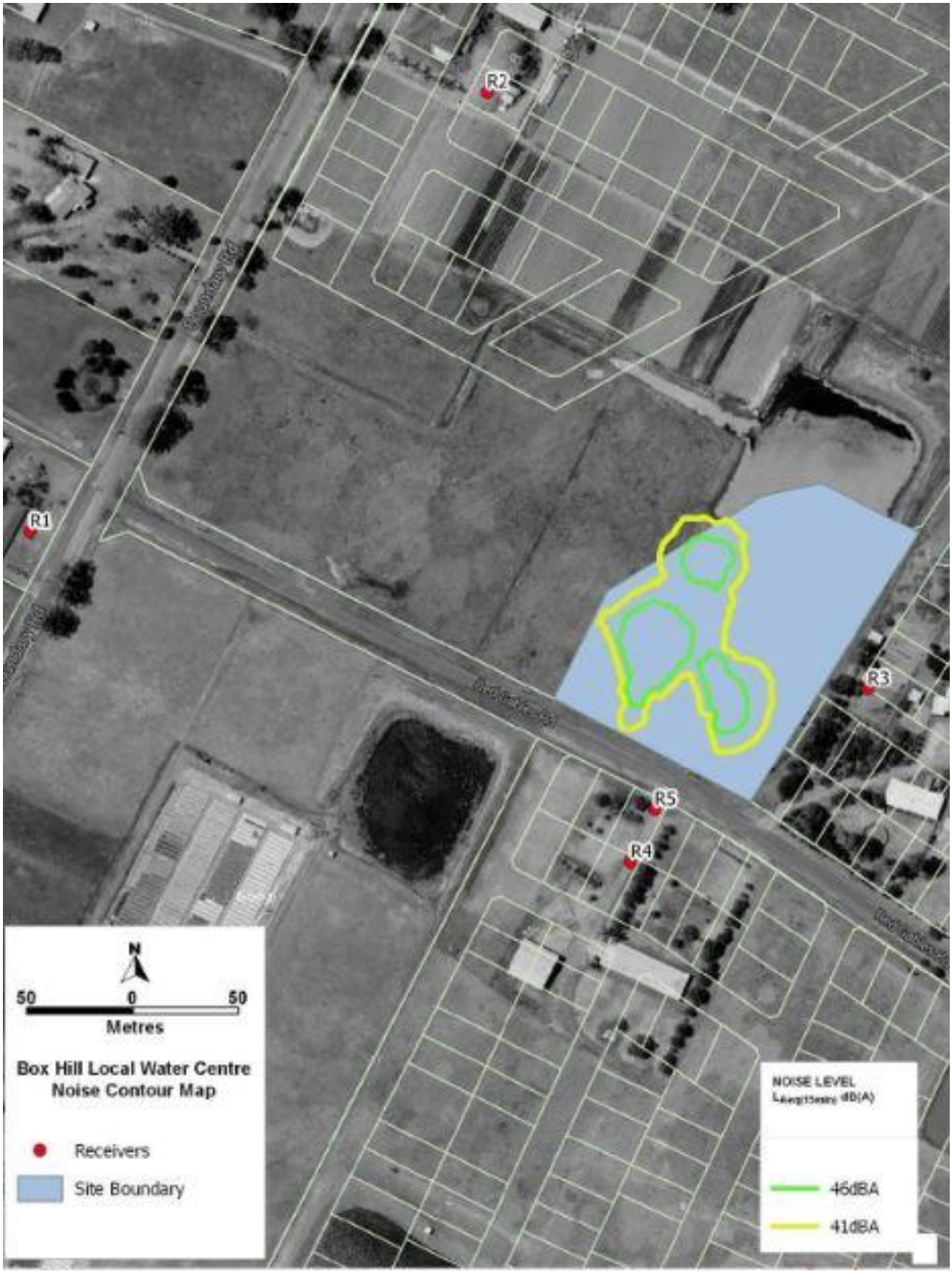
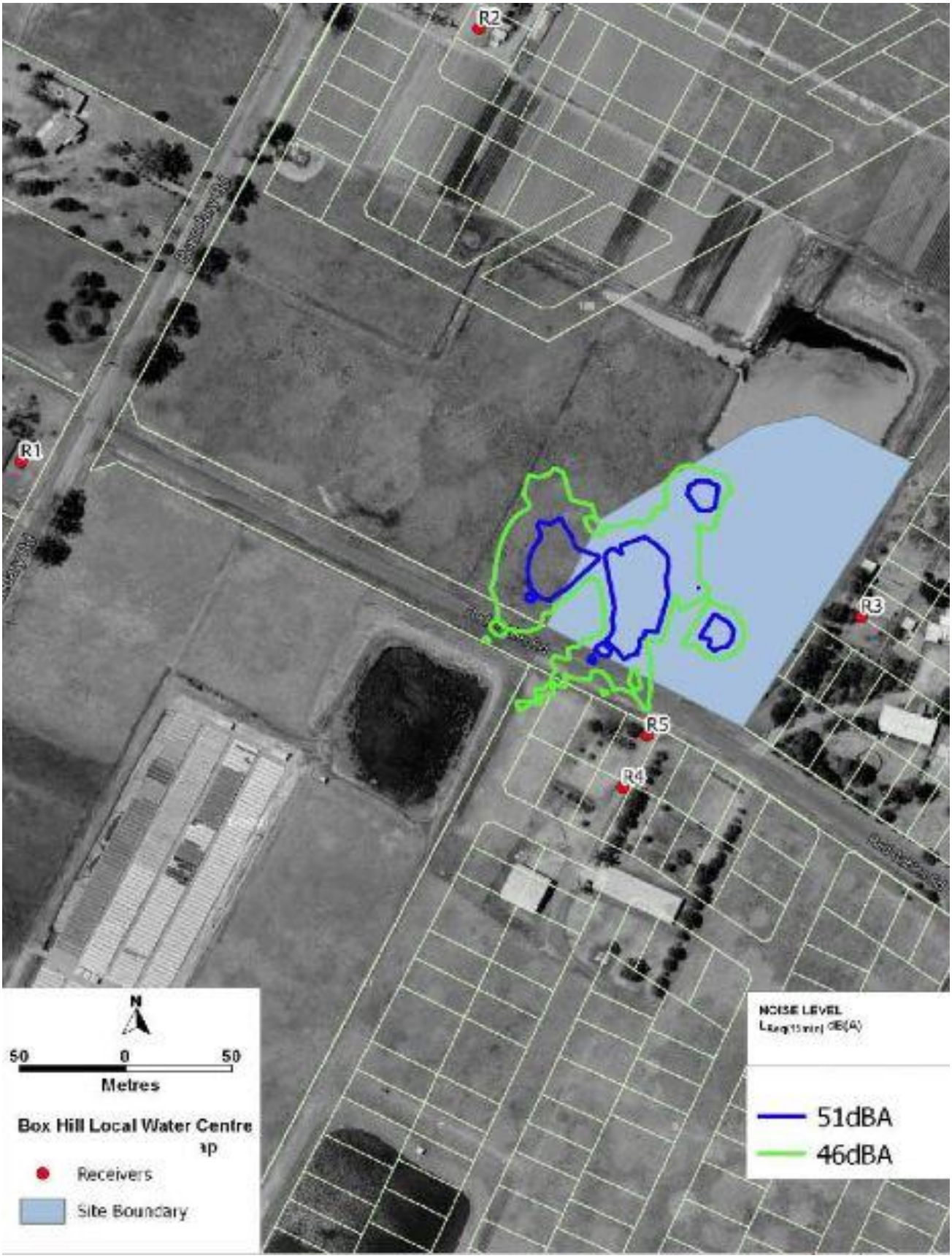


Figure 4 Noise Modelling – Abnormal Operation with back-up generator with recommended mitigation measures



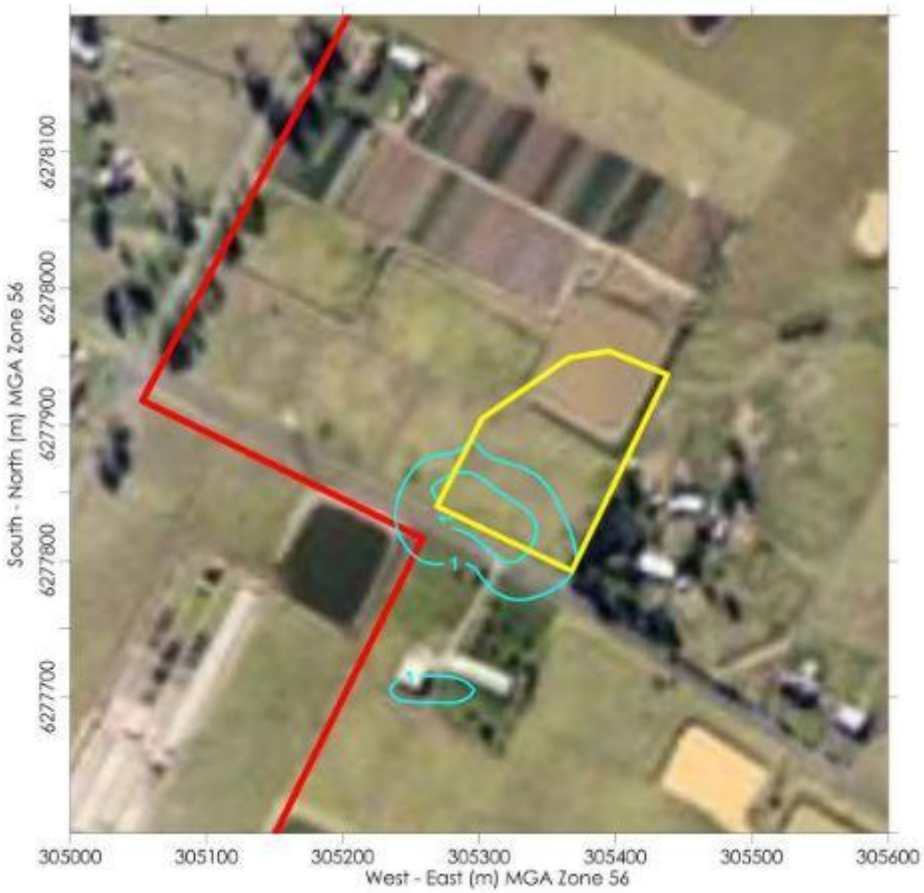


Figure 5 Odour Modelling – Predicted 99th percentile odour concentration (OU) when the Box Hill North LWC is fully operational

Mitigation Measures

The REF provides a large number of mitigation measures that will avoid or reduce the potential impacts of the proposal. These mitigation measures have been designed to minimise and or mitigate, as far as practical, the potential impacts. A summary of the mitigation measures can be viewed in **Table 1** below.

Table 1 Impact and Mitigation Measures – Box Hill North Local Water Centre

Impact	Mitigation Measures
General	All contractors and machine operators will be inducted on the environmental sensitivities of the work site(s) and relevant safeguards.
Land Capability, Erosion and Sediment Control	A plan for sustainable and permanent usage of recycled water generated by Stage 7 must be finalised prior to the commencement of construction on Stage 7 of the development.
	Sediment and nutrient controls will be implemented to reduce the impacts of stormwater, erosion and sedimentation on water quality. Specific erosion and sediment controls are to be contained within the site CEMP.
	All erosion and sediment control measures will be established before excavation and vegetation clearance begins. Control measures are to remain in place until all surfaces have been fully restored and stabilised.
	Sandbags will be placed at the entry points to any culverts and stormwater channels to prevent sediment entering the stormwater system.
	Any spoil storage areas or temporary stockpiles will have appropriate erosion control devices installed to control runoff and prevent sedimentation.
	Sediment control devices (e.g. silt fences, straw bales wrapped in geotextile etc will be installed parallel with the contours of the site and immediately down slope of any areas where the natural ground surface has been disturbed.
	Any spoil storage areas or stockpiles will have appropriate erosion control devices installed to control runoff and prevent sedimentation.
	Sediment and erosion control devices will be inspected regularly, maintained to ensure effectiveness over the entire duration of the project, and cleaned out before 30% capacity is reached.
	Disturbed areas will be stabilised by revegetation within 10 days after completion of construction.
	The natural landform of the site will be restored as closely as possible to the pre-works condition.
Flora and fauna	The full extent of any vegetation clearance will be clearly documented and mapped in the site's CEMP. The CEMP will prepared by the Box Hill North LWC construction contractor prior to the commencement of construction.
	Materials/equipment lay-down areas will be shown in the CEMP and located in cleared or degraded areas to prevent any damage to the surrounding plants or habitat.
	Materials, plant and equipment will not be stored within the drip-lines of any trees at the site.
	To prevent damage to vegetation outside the boundaries of access tracks, vehicles and machinery will be restricted to designated access tracks.
	Where access tracks run alongside areas of natural bushland, protective fencing or paraweb fencing is to be installed along the boundaries of the track to prevent vehicles from inadvertently entering/damaging bushland.
	Degradation or disturbance to areas of water-side (riparian) vegetation will be avoided to the greatest possible extent. Any such areas will be clearly identified in the CEMP.
	Where excavated soil is to be used in site restoration, it will be excavated and stockpiled in sequential layers corresponding to the existing soil profile. Topsoil and leaf litter is to be removed first and windrowed in separate stockpiles of less than 1m in height on the upslope side of excavations. Soil layers will be replaced sequentially so that the soil profile is restored as closely as possible to its pre-work status.
	All temporary erosion and sediment control devices such as silt-stop fencing will be removed from the site at the completion of the works or when the site is stabilised.
Heritage	All relevant Box Hill North Water staff and contractors should be made aware of their statutory obligations for heritage under the *National Parks and Wildlife Act 1974* and the *Heritage Act 1977*,

Impact	Mitigation Measures
(Aboriginal and non-Aboriginal)	which may be implemented as a heritage induction.
	This Due Diligence Assessment Report (**Appendix 5** of the REF) must be kept by Box Hill North Water so that it can be presented, if needed, as a defence from prosecution under Section 86(2) of the *National Parks and Wildlife Act 1974*.
	If unrecorded Aboriginal object/s are identified on the site during works, then all works in the immediate area must cease and the area should be cordoned off. OEH must be notified by ringing the Enviroline 131 555, so that the site can be adequately assessed and managed.
	In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, OEH must be contacted by ringing the Enviroline 131 555. An OEH officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the relevant Aboriginal stakeholders before works recommence.
	If, during the course of development works, suspected historic cultural heritage material is uncovered, work should cease in that area immediately. The OEH (Enviroline 131 555) should be notified, and works are only to recommence when an approved management strategy has been developed.
Stormwater and water quality	Mulch bunds up slope of the proposed disturbance areas.
	Coir logs are placed within the proposed drainage channel.
	Sediment fences down slope of all disturbed areas and material stockpile areas.
	Disturbed areas will be stabilised by revegetation within 10 days after completion of construction.
	Site disturbance will be minimised by containing machinery access to site areas required for approved construction works.
	Erosion potential would be limited by managing runoff fetches and velocities, with measures such as contour drains, silt fences and level spreaders
	Sediment filters such as silt fences, coir logs, or turf strips will be located downstream of disturbed areas.
	The storage and handling of fuels and chemicals shall comply with Australian Standard AS1940.
	No chemicals, fuels, and/or waste will be stored or collected for disposal within or adjacent to drainage lines or unsealed surfaces.
	A 'spill kit' will be kept on site at all times for potential chemical or fuel spills.
	Refuelling, fuel decanting and vehicle maintenance work will take place in a designated sealed and bunded area.
	An Incident Management Plan (IMP) will be prepared as part of the CEMP and will include a contingency plan and emergency procedures for dealing with the potential spillage of fuel or other environmental incidents that may occur on the work site. The IMP should also contain procedures dealing with the unexpected onset of rainfall during the work period.
	Drainage systems will be checked at regular intervals and maintained to ensure they are operating at full capacity (eg clearance of debris from drainage lines).
Noise	Additional lining of colorbond on the internal face of the plant room with appropriate air gap to accommodate 50mm thick polyester insulation of density 14kg/m3
	Internal walls of the pumphouse should be lined with minimum 50mm thick polyester or glasswool insulation of density 30kg/m3.
	All equipment used will comply with AS2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites.
	Work and deliveries will only occur during the following times: Monday to Friday 7am to 6pm, Saturday 7am to 6pm. No construction work or deliveries will occur on Sundays or public holidays.
	Regular and effective maintenance of all equipment, including vehicles moving on and off the site, will be conducted.

Impact	Mitigation Measures
	Plant and equipment which is used intermittently will either be shut down in the intervening periods between works or throttled down to a minimum.
	Any portable equipment with the potential to create high levels of noise (e.g. compressors, generators) will only be selected for use if it incorporates effective noise control. This equipment should be located, where practical, so that natural ground barriers are between it and the nearest potentially affected receivers.
Odour and Air Quality	All vehicles and machinery will be fitted with approved exhaust systems to maintain exhaust emissions within accepted standards.
	Machinery and vehicles will not be left running or idling when not in use for long periods.
	Odour or air pollutant emission complaints will be dealt with promptly and the source will be eliminated wherever practicable
	All loads of excavated material, soil, fill and other erodible matter that are transported to or from the work site will be kept covered at all times during transportation and will remain covered until they are unloaded either for use at the work site, reuse or disposal at a OEH licensed waste disposal facility.
	All work sites, general work areas and stockpiles will be closely monitored for dust generation and watered down (with clean water) or covered (via seeding or tarpaulins) in the event of dry and/or windy conditions.
	Rehabilitation of disturbed surfaces would be undertaken within 10 days of completion of construction on site.
Bushfire	All new buildings and structures are to be constructed in accordance with AS3959 – 2009.
	Internal road networks should be designed and constructed in accordance with Section 4.1.3 of PBP 2006.
	Any proposed development is to be linked to the existing mains pressure water supply and that suitable hydrants be clearly marked and provided for the purposes of bushfire protection. Fire hydrant spacing, sizing and pressure should comply with AS2419.1, 2005. Alternative water supplies may be considered where the proponent accepts that an adequate supply of water for firefighting operations can be provided.
Traffic and access	Any impact upon Red Gables Road associated with the works will be remediated to their original condition.
	The Contractor will maintain a complaints register. Any complaints received will be responded to as soon as possible.
	A traffic control plan prepared by a suitably qualified person will be submitted to Box Hill North Water for approval prior to commencement of work on the site.
Visual character	On completion of the works, all vehicles, construction equipment, materials, and refuse relating to the works will be removed from the work site(s) and any adjacent affected areas.
	Work sites will be restored as close to their original condition as possible following the completion of the proposed works.
Waste generation	All waste generated during the course of the works will be reused or removed from the work areas as soon as practicable and disposed of in accordance with the waste disposal safeguards.
	All vessels used for contaminated or hazardous waste should be sealed, labelled according to their contents, and stored within bunded areas until their removal from the work site.
	Any fuel, lubricant or hydraulic fluid spillages will be collected using absorbent material and the contaminated material disposed of at an OEH licensed waste depot.
	The work site will be left clean and free of weeds, debris and other rubbish at the end of works.
	All hazardous wastes on site will be removed and disposed in accordance with the state and national regulations and guidelines and best practice for the removal of these materials.
	The Contractor's recycling and reuse proposal will be detailed in the CEMP.
	Excess spoil material that cannot be reused on site will be utilised in the ongoing earthworks as part of the adjacent subdivision works.

Impact	Mitigation Measures
	Green waste from vegetation clearing will be either chipped for reuse; retained for rehabilitation; or mulched and spread immediately after the trench has been covered to prevent encroachment by weed species and minimise erosion. NB: where mulched vegetation is to be used measures to prevent organic material entering the local waterway shall be installed.
	Off-cuts of piping and other construction material will be recycled where possible.
Amenity and public information	The Contractor will maintain a complaints register. Any complaints received will be responded to as soon as possible.
	Accurate public information signs will be displayed while work is in progress and maintained in presentable manner.

Conclusion

Construction of the Box Hill North LWC will allow the provision of reticulated sewer services to the Box Hill North residential development. Following the assessment of potential environmental impacts through the work of various specialists the REF demonstrates that the proposal will result in no impact beyond relevant guidelines and legislation.

Various minor environmental impacts have been identified in this REF and these are generally temporary in nature. Specifically, it is unlikely that the proposal will have a significant impact on threatened species, populations and ecological communities listed pursuant to the *Threatened Species Conservation Act, 1995* or impact on matters of National Environmental Significance pursuant to the *Environmental Protection and Biodiversity Conservation Act, 1999*. There are no long term adverse effects created by the construction or operation of the proposal. The mitigation measures contained within the REF, which will be implemented, will avoid or reduce the potential impacts of the proposal.

The proposal will provide a service essential for the development of the approved Box Hill North residential development which greatly benefits the community by ensuring supply of affordable housing for the North-West Sydney and provide recycled water to the new development.