

Shenstone Park

Background Report

September 2019

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1 INTRODUCTION

The Victorian Planning Authority (VPA) in consultation with the City of Whittlesea Council (CoW) has prepared a draft precinct structure plan (PSPs) for the Shenstone park precinct. A PSP is a 'big picture' plan that sets the vision for developing new communities and is the primary plan for guiding urban development in the growth areas of Melbourne.

The precinct is included in the North Growth Corridor Plan (2012) which is a strategy for long term development of the northern corridor of Melbourne.

The Shenstone Park Precinct covers an area of 628 hectares will develop into a self-sustained precinct, with an emphasis on high quality neighbourhood design, service provision, high quality landscaping and retention of natural features. The liveability of the precinct will be supported by strong transport connections, job opportunities and community facilities.

Development of Shenstone Park will incorporate a diverse mix of residential neighbourhoods, a local town centre, community facilities and other employment uses. The centrally located town centre will promote self-sufficiency for residents of the precinct in meeting local daily retail and convenience needs. Residential and business development will capitalise on the precincts proximity to the existing Donnybrook Train Station, Hume Freeway, as well as the future Lockerbie Principal Town Centre (PTC).

The City of Whittlesea commissioned a number of background technical studies to inform the future urban form of the precinct. The purpose of this document is to provide a summary of the findings of these studies and to highlight issues and opportunities that were considered in the preparation of the PSP.

1.1 Purpose

This report summarises the key findings presented by the technical reports and analysis that informed the preparation of the Shenstone Park Precinct Structure Plan (PSP) and explains how this information guided the preparation of the proposed future urban structure. More specifically, this report:

- Summarises the strategic context of the precinct;
- Outlines the physical context of the site including topography, vegetation, waterways and contamination. Identifies the land use and development needs for the precinct; and
- Explains how the PSP responds to the key findings of the above.
- Consultation with relevant agencies has also guided the development of the PSP and some of the major considerations are also discussed here.

The technical reports listed in section 1.3 provide specific detail on the key elements outlined by this report.

1.2 Summary of PSP

In summary, the Shenstone Park precinct:

- The precinct covers 628 hectares of land with a net developable area of 325 hectares that will be a residential and employment precinct as guided by strategic planning policy;
- Will provide a total of 194 hectares of residential, with 131 hectares for employment land (of which around 34ha will be for the long term as it is contained within the within the Woody Hill Quarry blast buffer). There will also be a local town centre that will serve a local catchment;
- Plans for a population of between 10,200 and 11,300 people at various residential densities in response to walkable catchments within the urban structure;
- Plans for approximately 4,500 jobs in the longer term.
- Comprises an urban structure that draws upon and integrates the site's existing physical features including undulating topography, an existing quarry, significant native and exotic vegetation and an area of biodiversity significance;
- Will set aside a conservation area within the southern portion of the precinct of 69 hectares;
- Provides an extensive open space network designed with the site's topography and natural features;

- Requires the following infrastructure:
- Road and path network;
- Integrated Water;
- A government primary school;
- Community facilities;
- Sports reserve and local parks;
- Utility services.

1.3 Background Technical Documents

Technical investigations and findings that were used to inform the preparation of this report and the Shenstone Park PSP include:

- Aboriginal Cultural Heritage Assessment (Biosis, October 2017)
- Arboriculture Assessment (Treetec, February 2017)
- Bushfire Development Report for the Shenstone Park PSP (Terramatrix, April 2019)
- Community Infrastructure and Open Space Needs Analysis Report (VPA & City of Whittlesea, September 2019)
- Shenstone Park Economic Assessment (Urban Ethos, September 2019)
- Geomorphology & Vegetation Values Assessment (Alluvium & Eco Logical, February 2018)
- Hydrologic Regime Report (Alluvium & Eco Logical, February 2018)
- Land Capability Assessment (Meinhardt, March 2017)
- Post-Contact Heritage Assessment (Ecology & Heritage Partners, May 2017)
- Quarry and Sewerage Treatment Plant Impact Assessment (GHD, November 2017)
- Shenstone Park Impact Assessment Woody Hill Addendum (GHD, September 2019)
- Strategic Transport Modelling Assessment (GTA, September 2019)
- Utility, Services Infrastructure Assessment (Cardno, July 2017)
- Visual Character Assessment (City of Whittlesea, November 2017)

Reference should be made to the above original documents when reading this report. The original documents commissioned for the Shenstone Park PSP is located on the VPA website at www.vpa.vic.gov.au.

2 METROPOLITAN AND REGIONAL CONTEXT

2.1 Plan Melbourne 2017-2050

Plan Melbourne 2017-2050 provides high-level strategic guidance for land use and development across the metropolitan area. It was released in March 2017.

Within Plan Melbourne 2017-2050, the PSP area is identified as an 'urban area' adjacent to the 'rail network' – the Melbourne-Sydney rail line.

2.2 Northern Growth Corridor Plan

The Shenstone Park PSP is located within the Northern Growth Corridor in the City of Whittlesea approximately 35 kilometres north of Melbourne's Central Business District. The Shenstone Park PSP is bounded by Donnybrook Road to the north, the Wollert suburb boundary to the south, the Urban Growth Boundary to the east and the Sydney/Melbourne railway corridor to the west. The precinct lies immediately south of the Donnybrook/Woodstock PSP area and immediately east of the English Street PSP area.

The Shenstone Park PSP area together with these adjoining PSP areas will undergo a full transition of land use as part of large scale residential, commercial and industrial development, with considerable population increase and demographic change. Shenstone Park PSP forms part of the large-scale development of the Northern Growth Corridor, which ultimately will accommodate a projected population increase of between 260,000 to 333,000 new residents and 83,000 to 105,000 new jobs by 2051.

The Growth Corridor Plans were prepared by the Victorian Planning Authority (then the Growth Areas Authority) and released by the Minister for Planning in June 2012. The plans seek to accommodate a substantial amount of Melbourne's future housing and employment land supply over the subsequent 30 to 40 years by providing a framework to guide the planning of new communities in each corridor.

The Northern Growth Corridor (NGC) includes land within the municipalities of Whittlesea, Hume and Mitchell. The projected growth within the NGC has informed the broader sub-regional network of service and infrastructure provision. This means that as well as providing its own local services, the PSP planning needs to ensure there is no shortfall or loss of services within the broader growth area context (refer to Figure 2).

The NGC plan identifies the Shenstone Park PSP area as a combined residential and industrial precinct that also integrates a quarry and non-urban utilities uses. The proposed industrial land will contribute towards:

- Maintenance of Melbourne's competitive advantage in supply of land for this purpose.
 - Meeting Melbourne's longer term industrial and logistics needs will enable the city to cater for increasing demand as the city grows.
 - Maintaining and improving the north's jobs to dwelling ratio
 - Improve the range and diversity of jobs in the employment market

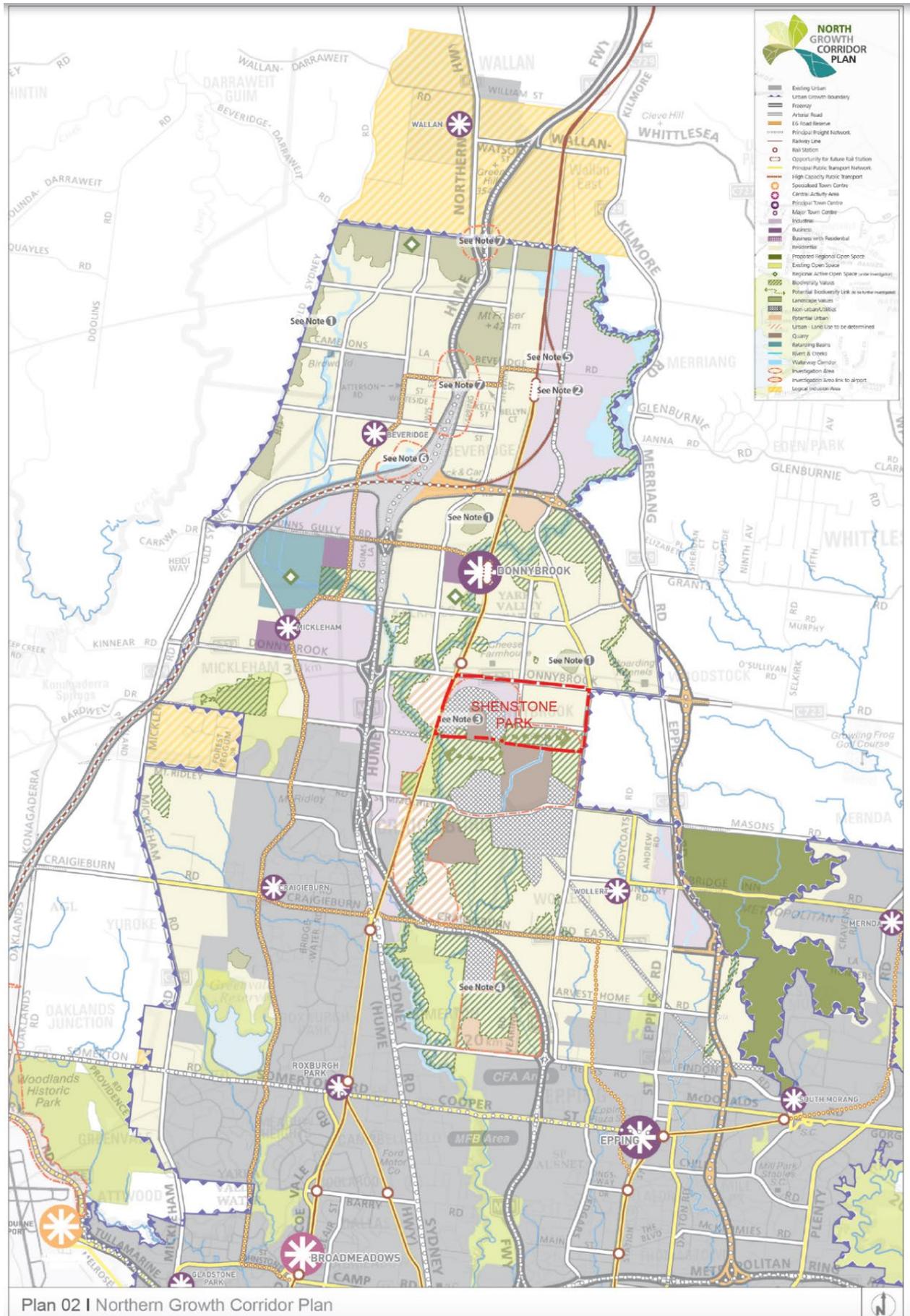
The NGC features significant road, rail, freight and public transport infrastructure, most notably Melbourne Airport and other significant logistics hubs. In particular, the precinct is well located within NGC for employment purposes by being on a key east-west arterial road, with an existing direct interchange to the Hume Freeway and future interchanges with the OMR and E6 Ring Road to the west and east respectively.

The Northern Growth Corridor Plan also:

- Preserves and enhances the natural features of the Growth Corridor, including the significant landscape and biodiversity values. New communities will benefit from an integrated open space network that provides a distinctive character and amenity, and existing biodiversity values will be preserved and enhanced.
- Provides for an enhanced public transport network comprising new rail stations along the Sydney-Melbourne rail line supported by a series of high capacity public transport services which will connect substantial parts of the corridor to higher order town centres and to stations along the heavy rail corridor.

- Extends the northern region's public transport and arterial road networks into the Growth Corridor so that future residents and workers will enjoy a similar level of accessibility to those living and working in established parts of the north;
- Facilitates the creation of new town centres and employment areas that contribute to the ongoing diversification and growth of the northern region's economy. New Town Centres will be planned to complement the significant role of the Broadmeadows Central Activities Area (CAA) for Melbourne's north. These town centres have been located on the public transport networks to maximise accessibility; and
- Provides for a variety of housing choices that can meet the needs of the new communities not only in initial development but also as the community matures and changes over time.

Figure 1 - Precinct location in the Northern Growth Corridor Plan



Plan 02 | Northern Growth Corridor Plan

3 EXTRACTIVE RESOURCES

3.1 Woody Hill and Phillips Quarries

Extractive resources located within the PSP and surrounds are considered to be of strategic importance to supply raw materials for infrastructure to support short- and longer-term growth in Northern Growth Corridor and Greater Melbourne.

The North Growth Corridor Plan specifically identifies two quarrying areas within and adjacent to the Shenstone Park PSP. These are the Woody Hill and the Phillips Quarries. The Woody Hill Quarry operates within the south western portion of the PSP, while the Phillips Quarry adjoins the PSP to the south east but is not currently in operation

The Extractive Resources in Victoria: Demand and Supply Study 2015 – 2050, 2016 PwC (the Study) concluded that the annual demand for extractive resources in Victoria is expected to double from 2015 to 2050 because of ongoing growth in residential and commercial development, community infrastructure and transport and utilities infrastructure. The City of Whittlesea will be the fourth highest local government area for extractive resource demand to 2025 (32.8 million tonnes cumulative demand) and sixth highest to 2050 (64.3 million tonnes cumulative demand). The Study identified Whittlesea as an area at risk of shortfalls and resource depletion, which could result in significant infrastructure cost increases for Greater Melbourne, should encroachment or sterilisation of extractive resources occur. Without additional hard rock quarries or expansions, the study found Whittlesea could expect significant hard rock production shortfalls in the short (937,904 tonnes shortfall in 2025) and long (2,031,220 tonnes in 2050) term, with cumulative potential production shortfalls of 43.2 million tonnes over the period 2015 to 2050.

Helping Victoria Grow: Extractive Resources Strategy, 2018 DEDJTR (the Strategy) highlights that demand for extractive resources in Victoria is at an all-time high, and supply shortfalls have begun to emerge. This situation has therefore created an urgent need for the Government to take immediate action to secure high-quality resources particularly in proximity to major growth areas to meet Victoria's current and future infrastructure and affordable housing requirements. The Strategy recognises that urban expansion towards existing quarries and potential sterilisation of known extractive resources is a key factor in reducing available strategic supplies that are much needed for Victoria's, and in particular, Melbourne's growth. The Strategy outlines a range of short and long-term actions and initiatives to secure resources needed to support growth. Strategic engagement and advice to ensure critical resources (such as Extractive Industry Interest Areas and quarries in Whittlesea) are protected from encroachment is on such initiative.

Soon after the release of the Strategy in 2018, the Minister for Resources and the Minister for Planning released a Joint Statement to implement certain high priority planning related actions foreshadowed in the Strategy. To streamline approval processes to expand production and protect the continuity of supply from existing quarries, the Joint Statement introduced an Extractive Industry Project Hot List. This Hot List identifies existing quarries seeking to expand in strategic locations and foreshadows that they be given priority planning consideration to ensure additional extractive resource supplies come online without delay. The Woody Hill Quarry was listed on the Hot List.

Further, the Shenstone Park PSP lies within an Extractive Industry Interest Area (EIIA). EIIs were established to raise awareness that extractive industry is a potential land use and to facilitate protection (from competing land uses) of extractive resources within the Melbourne Supply Area and other regional centres around Greater Geelong, Ballarat, Latrobe and Bendigo. EIIs seek to do this by:

- Providing a basis for the long-term protection of stone resources from sterilisation by inappropriate land uses
- Providing a basis for ensuring the long-term availability of stone resources for use by the community at a minimal detriment to the environment
- Assisting in considering extractive industry values in long term strategic planning as well as local strategy plans
- Ensuring that planning or responsible authorities consult with all relevant agencies about land use proposals which may impact on the reduction of stone resources within these areas
- Creating an awareness that extractive industry is a potential land use in these areas.

3.2 Outcomes and Recommendations

Allow for the continued and expanded operation of both quarries, while considering broader objectives of planning for the area, including the proposed land uses outlined in the Northern Growth Corridor Plan, existing approved PSPs, further infrastructure requirements and land constraints such as biodiversity and conflicting buffers.

The Woody Hill Quarry is also in proximity to the proposed location for the Wollert Sewerage Treatment Plant (STP) and while the STP sits outside the PSP area, consideration will need to be given to this important infrastructure that will service large parts of the Northern Growth Corridor (and which was identified as necessary in the Northern Growth Corridor Plan). A blast restriction area has been shown on the FUS to highlight the need for quarry operations to consider the STP in future development.

Figure 2 – Extractive Industry Interest Area Coverage of Precinct



4 PHYSICAL CONTEXT

The Shenstone Park PSP area comprises approximately 628 hectares of land and is bound by Donnybrook Road to the north, the Wollert suburb boundary to the south, the Urban Growth Boundary to the east and the Sydney/ Melbourne railway corridor to the west, (see Figure 3).

The precinct has been predominately used for agricultural purposes, extractive industries being the Woody Hill Quarry and utilities characterised by water assets and electricity and gas infrastructure. Furthermore, the landform is generally flat and punctuated by stony knolls and River Red Gums that dominate the landscape. A range of historic buildings, sheds and farmsteads along with dry stone walls highlight the historic settlement patterns of the area. A visual highpoint for the area is Woody Hill which is a former volcanic cone which is currently being quarried and will eventually become part of the existing surrounding landscape. Hayes Hill located to the north in the Donnybrook/Woodstock PSP area is also prominent from some areas of the Shenstone Park.

The physical context of the Shenstone Park PSP is characterised by:

- Topography, which includes Woody Hill, dry stone walls.
- Water bodies, Merri Creek and Curly Sedge Creek.
- Biodiversity, large portion of land within the Biodiversity Conservation Area 28 and contains Red River Gums, stony rises and federally listed grassland communities. There is also a small area of Biodiversity Conservation Area 34 which contains Growling Grass-frog habitat.
- Vegetation, clusters of River Red Gums.
- Post-contact heritage, places and buildings.
- Cultural heritage.
- Contamination.
- The existing quarry.
- Farm uses.

Figure 3 - Aerial of the Precinct



4.1 Surrounding Areas

Several new settlements are currently planned, being developed or development has recently finalised around the Donnybrook area. Surrounding land uses and developments relevant to the precinct include:

Donnybrook / Woodstock Precinct Structure Plan

The Donnybrook / Woodstock PSP is immediately north of the Shenstone Park PSP. Spanning the Shire of Mitchell and City of Whittlesea, the Donnybrook/Woodstock precinct is projected to have a future population of 46,700 people and a yield of 16,700 dwellings.

The precinct is generally bound by the E6 – OMR reservation to the north, Donnybrook Road to the south, Merriang Road to the east and the Sydney / Melbourne Railway Corridor to the west. The precinct includes a total area approximately 628 hectares and its future land uses will be predominantly residential with the provision of five local town centres of varying scales.

The local town centres will be accommodating a mix of retail and community uses, and when combined with additional employment opportunities it is anticipated the Donnybrook / Woodstock precinct will accommodate 3,400 jobs.

English Street Precinct Structure Plan

English Street is located immediately west of the Shenstone Park PSP. The PSP area is generally bound by the Merri Creek to the west and south, Donnybrook Road to the north; and the Sydney / Melbourne Rail Corridor to the east. The precinct includes a total of 143 hectares and its future land use will be residential in nature. English Street is projected to have a future population of 3,300 and yield of 1,200 dwellings. Furthermore, English Street provides for a significant employment precinct adjacent to Donnybrook Road and the Sydney / Melbourne Railway Corridor. It is anticipated that this precinct will provide a job yield of 830 jobs.

Lockerbie Precinct Structure Plan

Applying to some 1122 hectares of land, the Lockerbie PSP is located immediately west of Donnybrook / Woodstock and is predominantly located within the City of Hume with some encroachment into the Shire of Mitchell and City of Whittlesea. The PSP was approved in 2012 and will be home to 28,600 residents and accommodate 10,200 dwellings. The main function of the Lockerbie PSP is to locate a future Principal Town Centre that was first identified in Melbourne 2030. The Lockerbie Principal Town Centre will serve a regional role and function providing the location of higher order health, education and shopping facilities as outlined in the Northern Growth Corridor Plan. This precinct is anticipated to generate 3,400 new jobs.

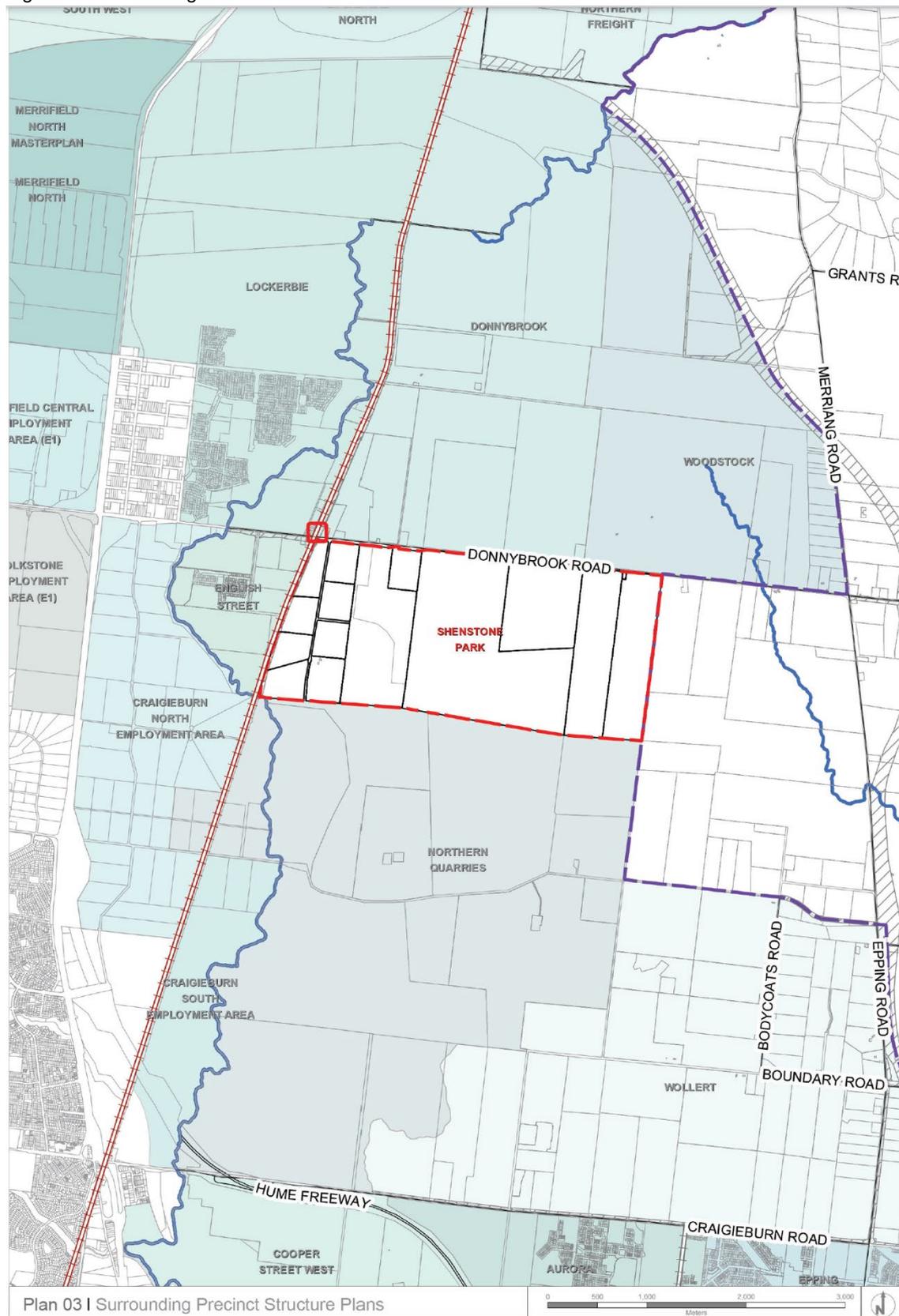
Craigieburn North Employment Area Precinct Structure Plan

The Craigieburn North Employment Area is located immediately west of English Street and South-West of Shenstone Park within the City of Hume. The main purpose of this PSP is to provide a mixed employment area that services the Northern Growth Corridor of Melbourne. The precinct is to provide 8,200 jobs from a mix of industrial, retail and office-based land uses. No residential development is planned for the precinct.

Northern Quarries Investigation Area

This area comprises a mix of uses of existing and future uses, including utilities, quarries, conservation areas and future urban areas located immediately south of Shenstone Park PSP and east of the English Street precinct. It is currently being investigated in terms of what are the most appropriate land uses for the future.

Figure 4 - Surrounding PSPs



5 LOCAL CONTEXT

The Shenstone Park area is likely to lie within the traditional land of the Woi Wurrung, a language group part of a broader language area known as the East Kulin Language Area. It is believed the East Kulin Language group covered central Victoria from the east side of Port Phillip Bay to the north of the Murray River for the last 40,000 years.

Grazing runs had been established by squatters in the area by the late 1830s, and the area has remained predominantly pastoral and agricultural ever since. Given this history, it is demonstrated that the area includes relic vegetation, post and rail fencing, the remains of agricultural structures, such as stock pens and yards or on-farm basalt quarries and dry stonewalling.

5.1 PSP Size, Lot Size and Ownership Pattern

The Shenstone Park PSP applies to approximately 628 hectares.

There are 17 individual property parcels in total. Lots sizes vary throughout the precinct with much larger landownership parcels within the centre and east of the precinct. These lots have been traditionally used for agriculture. Medium sized lots are present along Langley Park Drive, with a scattering of smaller excised dwelling parcels located along Donnybrook Road.

Land within the western half of the Shenstone Park PSP area contains the existing Woody Hill Quarry. The existing quarrying operations include above ground blasting, and concrete batching. Just beyond the southern boundary of the site, the future processing element of the Sewerage Treatment Plant (STP) (immediately south-east of the Woody Hill Quarry) and future basalt quarry have been nominated. Buffers associated with the STP and quarry will extend partially into the southern section of the Shenstone Park PSP area. The storage ponds of the sewerage treatment plant will be located within the Shenstone Park PSP area on Langley Park Drive, and consistent with the North Growth Corridor Plan for incorporation of non-urban utilities. Land to the east of the Shenstone Park PSP area is bisected by an APA Gas Pipeline easement.

5.2 Topography, Geology and Waterways

Topography and Landform

The Shenstone Park area is located at the eastern extremity of the Victorian Volcanic Plains Region, an area consisting of basaltic lava flows, collectively known as the Newer Volcanics. As a result of this geological history, the area is characterised by a flat undulating plain with numerous stony rises or knolls.

Within the central west of the site, towards the western end of the investigation area and being some 270m above sea level, Woody Hill is visible from most vantage points and is a reminder of the past geological activity of the area. At the top of the rise is a large depression forming part of a quarry associated with the extractive industry operation on the land. The extractive industry use has been operating at Woody Hill since the 1980s extracting mostly sandstone and basalt rock. The remnants of the hill are more prominent from the western side.

Most of the area is characterised by flat landform that is disrupted by the occasional stony knoll and shallow tributaries that appear to be little more than depressions in the ground. Due to existing agricultural practices, most of the land is characterised by open paddocks with scattered historic buildings, sheds and farmsteads along with dry stone walls in the area. There is a distinct wooded area within the south-eastern section of the PSP area. River Red Gums dominate this part of the landscape due to large groupings that are broken up by open grassy expanses. This tree group features high biodiversity values and generally sits within the Merri Creek floodplain. This is detailed in the *City of Whittlesea – Shenstone Park Visual Character Assessment, November 2017*.

Catchments and Drainage

The Study Area is located within the Port Phillip and Western Port Catchment. Surface water runoff from within the Study Area is likely to move in a generally south-westerly direction towards Merri Creek and/or other minor tributary water bodies which eventually feed into Merri Creek. Merri Creek forms the south westernmost boundary to the PSP. Merri Creek flows in a southerly direction, where it eventually discharges into the Yarra River.

An ephemeral water course (unnamed) passes through the central and western parts of the Study Area (through properties 4 to 12), joining Merri Creek in the south-western corner of the Study Area.

Another ephemeral water course (Curly Sedge Creek) starts within the Study Area, passing out of the Study Area to the south. This also eventually joins with Merri Creek approximately 5 km south of the Study Area.

A final ephemeral water course (unnamed) starts within the Study Area in the northern part of the PSP, flowing south east throughout the Study Area. This joins Darebin Creek approximately 1 km south east of the Study Area.

Several smaller dams and channels are located across the site on the larger agricultural properties within the PSP. The assumed drainage paths have been determined in conjunction with the site contour map. However, appropriate drainage infrastructure will be required to manage surface water runoff if development is to proceed in these areas.

Biodiversity

Prior to European settlement the precinct was dominated by several ecological vegetation communities. Since European settlement the vegetation has been altered due to agricultural and farming practices. The precinct has been largely cleared for agriculture; however, there are several areas of remnant vegetation.

The time stamped data from the Department of Environment, Land, Water and Planning (DELWP) shows the Ecological Vegetation Classes (EVC) within the Precincts were:

- Plains Grassy Woodland (EVC 55)
- Plains Grassland (EVC 132)
- Grassy Woodland (EVC 175)
- Riparian Woodland (EVC 641)
- Creekline Tussock Grassland (EVC 654)

The BCS identifies the above conservation areas in PSP 69.1. They have been identified due to their biodiversity values that are a matter of national environmental and state significance. Urban development is to be excluded from conservation areas and each area will be protected and managed. All other vegetation may be offset, cleared or managed in accordance with Clause 52.17 of the Whittlesea Planning Scheme and Council's River Red Gum Policy at Clause 22.10. Refer also section 12 – Biodiversity for more detail regarding biodiversity matters within the PSP.

6 ABORIGINAL CULTURAL HERITAGE

The Shenstone Park area likely lies within the traditional land of the *Woi Wurrung*, a language group part of a broader language area known as the Kulin Nation. It is believed that the *Woi Wurrung* group had land north of Melbourne, east of Werribee River, including the Yarra and Maribyrnong watershed.

While there are no historic references specific to the study area, it is believed the clan occupying land that may have included the Shenstone Park area were the Wurundjeri William, a patriline of the Wurundjeri Balug. The Wurundjeri William in this area was led by Bebejan a clan head who had a strong association with the Merri Creek.

Today, the Wurundjeri Tribe Land Compensation and Cultural Heritage Council Incorporated is the Registered Aboriginal Party (RAP) under the Aboriginal Heritage Act 2006, with responsibilities in relation to the management and administration of Aboriginal Cultural Heritage matters in the area. As the land sits within a broader area of cultural sensitivity (Merri Creek and Darebin Creek) as defined by the Aboriginal Heritage Register, all land owners within the highly sensitive area will be required to complete a Cultural Heritage Management Plan (CHMP) prior to the approval of any application for residential development.

Council, on behalf of the VPA, engaged Biosis to complete the Aboriginal Cultural Heritage Impact Assessment for Shenstone Park, which form the early stages of the CHMP. The purpose of the assessment was to identify areas of aboriginal heritage sensitivity by completing a background assessment and a site survey. The assessment identifies the level of sensitivity in the precinct by developing a predictive model and making recommendations on how these areas would be treated in the Precinct Structure Plan.

Biosis undertook the assessment through a three-step process of completing a desktop review of relevant literature and previous assessments undertaken within the region; developing a predictive model of the archaeological sensitivity across the precinct; and refining the assumptions through site surveys of those properties that permitted access and make recommendations to inform the urban structure of the precincts. The model mapped sensitivity levels across the precinct ranging from High Aboriginal Heritage Sensitivity to Low Aboriginal Heritage Sensitivity. By mapping these areas, the identified risks could be mitigated and areas of likely significance could be incorporated into the PSP design process.

In addition to the assessment, a cultural values recording of the area was also conducted by Biosis which was to complement the background research and identification of tangible heritage within the Shenstone Park PSP. This provided the opportunity for Wurundjeri Council Elders to view the study area and establish the cultural heritage values of the study area. The Merri Creek was deemed culturally significant due to its place in Wurundjeri cosmology and its relationship with Bebejan. Prominent stony rises and areas of remnant vegetation were identified as areas of special interest to the Wurundjeri people, in that they provide important habitat for native flora and fauna and are links to pre-European landscapes.

6.1 Cultural Values

The assessment identified that there are three recorded Aboriginal Cultural Heritage Places on the Victorian Aboriginal Heritage Register, which consists of two scattered artefacts and one low density artefact distribution. 187 Registered Aboriginal Places are located within the geographic region, the area which generally encompasses the Shenstone Park PSP area, Donnybrook/Woodstock and English Street PSP areas, and the Northern Quarries investigation area. The most common site type in this area was identified as being Low Density Artefact distributions.

A survey was carried out and 6 properties (totalling 498 hectares) of the precinct were surveyed. The assessment recorded one new artefact site. The landscape features were assigned a level of sensitivity. The flat basalt plains and areas excavated at the quarry were defined as having low sensitivity, whereas the stony rises and waterways were classified as having high sensitivity.

6.2 Recommendations and Outcomes

Biosis provided the following recommendations to address Aboriginal Heritage in the precinct:

1. Areas of archaeological potential identified in the current assessment, namely stony rises, plains near waterways and remanent native vegetation should be included, where possible in public open spaces. This approach eliminates the likelihood that Aboriginal places will be harmed.

Management of these open space reserves should also be based on conserving and enhancing environmental and cultural heritage values. Construction of infrastructure and facilities within the reserves should be designed to minimise impacts and enhance public access and appreciation, through landscaping, indigenous revegetation, interpretation and development of cultural programs.

2. CHMPs should be prepared for the entire study area. This recommendation is based on areas of archaeological potential being identified in the current assessment and presents a methodology that ensures best cultural heritage practice is maintained, regardless of triggers to prepare a mandatory CHMP. This is also consistent with the results of the cultural heritage values assessment that concluded that the wider landscape has importance to Aboriginal people.

Where conservation of areas of Aboriginal cultural heritage is not possible due to conflict with future development, and disturbance has been approved through a CHMP, the process of disturbance should be managed through a program mitigation involving research, analysis and interpretation of the cultural heritage that is disturbed. A research design and methodology should aim to identify the character of Aboriginal occupation of the area, mitigate disturbance in the form of archaeological salvage, and interpret the heritage.

Figure 5 - Areas of Cultural Sensitivity



(Source Biosis Aboriginal cultural heritage assessment October 2017)

7 POST CONTACT HERITAGE

Ecology and Heritage Partners (EHP) were engaged by Council on behalf of the VPA to complete a post-contact (i.e. non-indigenous) cultural assessment for the Shenstone Park PSP area. The findings are to guide master planning for the PSP area, identifying possible opportunities and constraints to development. The assessment included the research and the analysis of potential post-contact sites within the precinct. EHP completed a field survey and consultation with relevant organisations to complete a thematic history for the precincts.

The area was first surveyed in 1838 by Robert Hoddle, and since this time the area has remained predominantly pastoral and agricultural ever since. The property at 1030 Donnybrook Road is named 'Shenstone Park' and has a number of farm structures that link to the early 20th century agricultural practices that occurred in the area. For the broader precinct area links to the history of the area are evident from relic vegetation, post and rail fencing, the remains of agricultural structures, such as stock pens and yards and drystone walling. It was noted that three sites were formerly located within the Victorian Heritage Inventory (VHI), namely drystone walls.

Four other sites which were not previously identified for their historic significance were included within this report, two within the precinct and two on the property to the immediately to the east of the PSP area. These sites include:

- Sheds and outbuildings from a late-19th to early-20th century farm complex at 1030 Donnybrook Road;
- A concrete-sealed brick cistern at 1030 Donnybrook Road;
- A 19th century bluestone cottage at 1190 Donnybrook Road (outside the precinct); and
- A concrete-sealed brick cistern at 1190 Donnybrook Road (outside the precinct).

Two sites at 870 Donnybrook Road and 960 Donnybrook Road were also identified as having potential historical values but did not warrant listing on the VHI. These sites are:

- The possible location of a structure mapped on 1916 and 1938 topographic maps at 870 Donnybrook Road; and
- The potential site of the former homestead at 960 Donnybrook Road.

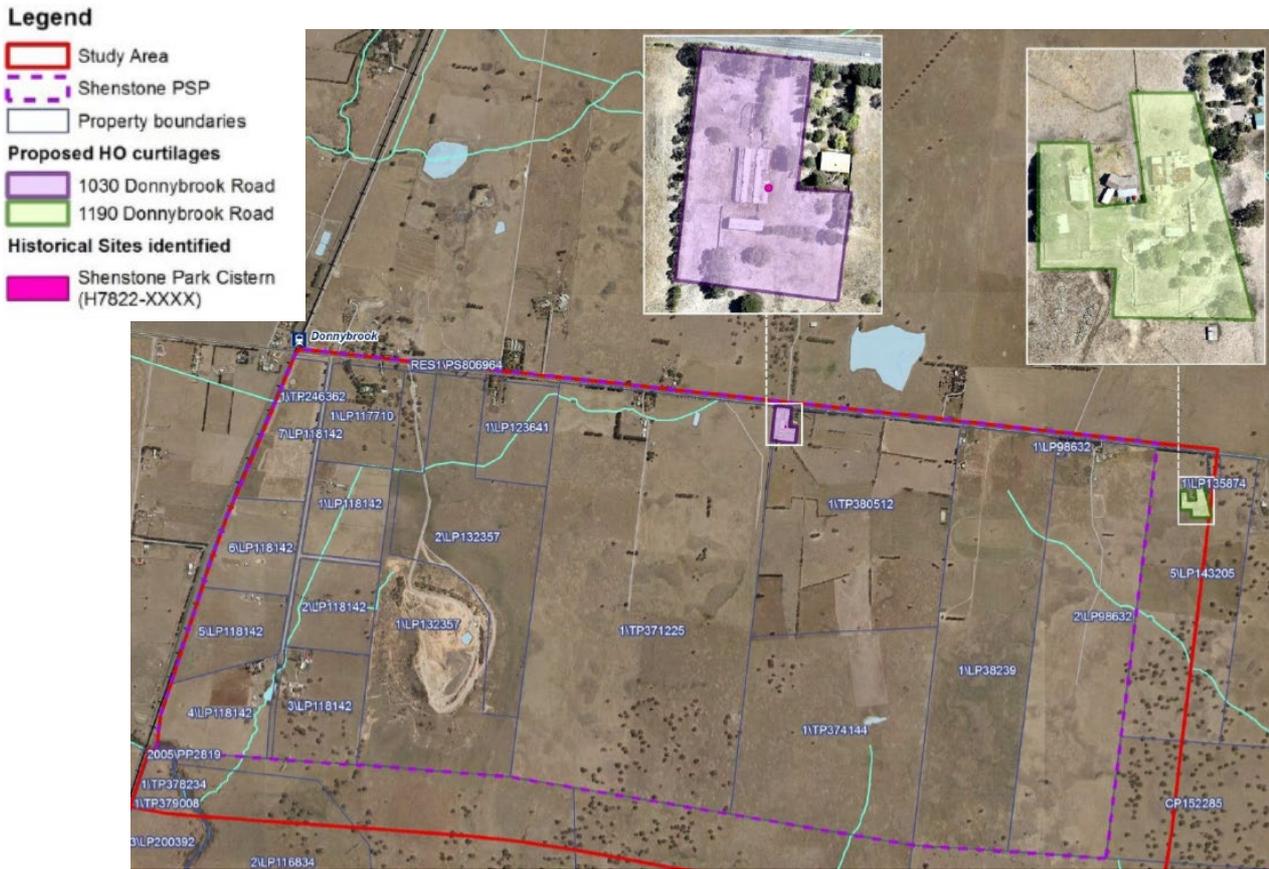
7.1 Recommendations and Outcomes

The final recommendations are as follows:

Include within the Whittlesea Planning Scheme Heritage Overlay

- Addition of portions of 'Shenstone Park', 1030 Donnybrook Road, Donnybrook, to the Heritage Overlay of the Whittlesea Planning Scheme.
- Require the preparation of a Conservation Management Plan for any buildings within suggested HO curtilage at Shenstone Park.

Figure 7 - Proposed Curtilages and Historical Sites Identified for HO Inclusion



(Source, Ecology & Heritage Partners Assessment)

Outcomes and Recommendations

While the Meinhardt report recommended applying the EAO to the on property identified as having a high risk, it is only appropriate to apply the EAO when a sensitive use is proposed to be allowed on the property. As the property will be used for quarrying purposes for the foreseeable future, the application of the EAO is not necessary.

Medium risk – an environmental site assessment should be completed on these properties and a provision for this will be included in the schedule to the Urban Growth Zone (UGZ).

8.2 Geology / Quarrying

A visual highpoint, Woody Hill, is a former volcanic cone which since 1987 has been quarried and will eventually become part of the existing surrounding landscape. Immediately to the south-east of the Woody Hill Quarry, (just beyond the Shenstone Park PSP area) is the location of the future Phillips Quarry.

The Woody Hill Quarry is an active sandstone quarry that uses a range of extraction techniques including blasting as part of their operations. The Phillips Quarry will allow for the extraction of basalt.

Given the future contextual change for which these quarries will be operating within, GHD were engaged to undertake a series of assessments against the approved extraction practices of the Woody Hill Quarry and Phillips Quarry. The aim of these assessments was to identify appropriate separation distances between the quarries and land use planning associated with the development of the Shenstone Park PSP, and to ascertain the maximum possible extent of expansion of the Woody Hill Quarry, based on a number of limiting factors, including the residential areas in Donnybrook/Woodstock PSP and proposed in Shenstone Park PSP and the proposed Yarra Valley Water sewerage treatment plant (STP).

Specifically, the investigations included the following:

- Review of available environmental, planning and quarry information in consultation with stakeholders;
- Technical air, noise, vibration and blasting assessments of current and approved quarry operations to identify site-specific off-site impacts for the PSP area;
- Technical air, noise, vibration and blasting assessments of an expanded quarry operation scenario, taking into account site constraints;
- Analysis of environmental risks (air, noise and vibration) and the impacts of such risks on sensitive and non-sensitive land uses and buildings;
- Provide advice on the potential lifespan of both quarries; and
- Provide recommendations for management and/or mitigation of environmental risks on land uses.

The report found that a 550m sensitive use buffer for stone extraction quarries that have active blasting were suitable to mitigate amenity impacts (including vibration, dust, grit and odour) between the quarries and future land uses, and should be implemented for the Shenstone Park PSP.

More specifically the buffers prohibit most development within 200m from the expanded extraction boundary to mitigate against safety issues from fly-rock and vibration (the blast buffer) Given this, it is expected that the Industrial land uses that are designated generally within the northern and eastern sections of the blast buffer, would only develop in the long term when extractive operations have contracted and / or been completed.

The remaining 350m of the buffer would be suitable for development of industrial employment land, ensuring sensitive uses were prohibited.

The report recommended a 613m directional buffer be applied to the Yarra Valley Water STP and sensitive uses be precluded from that buffer.

The report also recommended a 900m operational noise buffer around the current operations of the quarry, and the addendum report recommended a 600m noise buffer around the future expansion area of the quarry. Mitigation at either the source or receptor was recommended to protect impacts on residential areas.

The addendum report considered the possibility of expanding the quarry operations to take advantage of further earth resource materials that have been identified as significant to the state. It shows that the quarry could expand to the north and east while maintaining the sensitive use buffer outside residential areas.

Outcomes and Recommendations

Based on the background reports, the following recommendations are proposed:

The following buffers are recommended for the Woody Hill Quarry:

- Blast buffer (200m)
- Sensitive use buffer (550m directional)
- Expansion noise buffer (600m)
- Existing operations noise buffer (900m)

The following buffers are recommended for the Phillips Quarry:

- Blast buffer (200m)
- Noise buffer (300m)
- Sensitive use buffer (500m)

There is also a 613m directional sensitive use buffer recommended for the proposed Yarra Valley Water Sewerage Treatment Plant.

9 UTILITY AND SERVICE INFRASTRUCTURE

Overview

The infrastructure required to cater for the development of Shenstone Park precinct can be readily provided within the framework of the infrastructure planning for the precinct by the relevant authorities. The planning for the Donnybrook/Woodstock PSPs has substantially progressed the extension of services along Donnybrook Road which is the main service corridor for all precincts in the area.

There are a number of existing and proposed trunk services facilities and pipelines within or adjacent to the precinct that have the potential to impact on adjacent development and these impacts need to be considered in the further planning of the precinct. These include the following:

- Yarra Valley Water's (YVW) proposed Recycled Water Treatment Plant/Sewerage Treatment Plant
- YVW's proposed pipe track along the western boundary of the precinct
- YVW's Sewer Pump Station in the south east of the precinct
- Existing power transmission lines in the south west of the precinct
- APA's existing gas transmission pipelines and associated easement
- AGN's existing City Gate station

In addition, a Safety Management Study (SMS) is required to assess the interface between the gas transmission pipelines and development. An acoustic assessment of the City Gate station is also recommended prior to development.

Further details of the provision of infrastructure are summarised below.

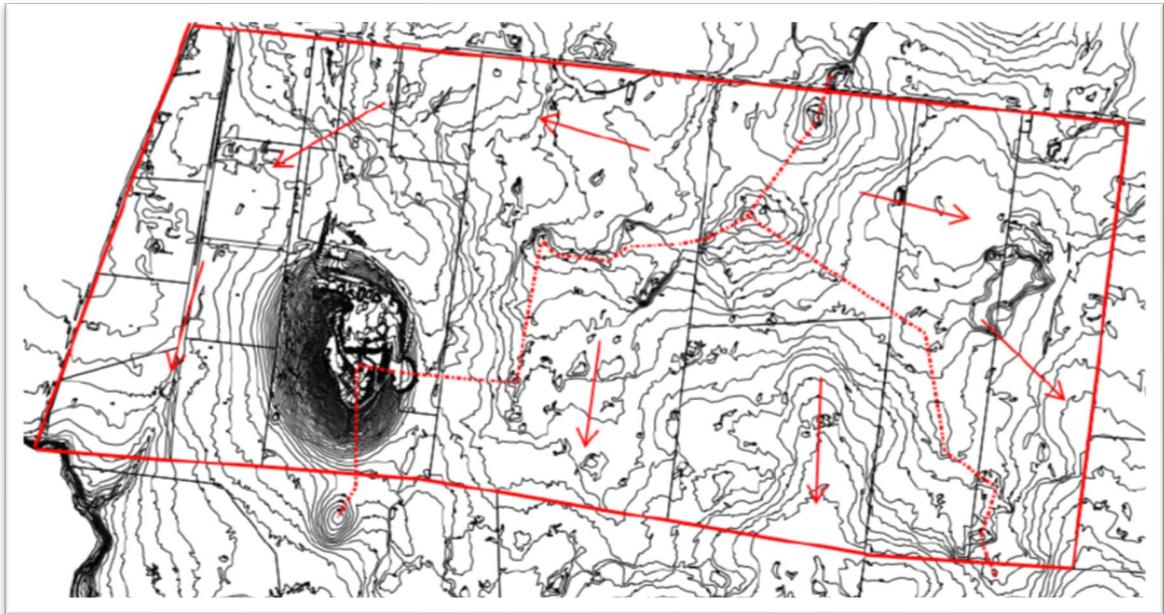
9.1 Drainage

The existing catchments for the northwest portion of the site fall to the west then south towards Merri Creek. The central part of the site falls to the south, towards Curly Sedge Creek, whilst the northeast portion of the site falls to the east and then south.

The responsible authority for the provision of drainage in Shenstone Park is Melbourne Water. Melbourne Water will oversee the Development Services Scheme (DSS) for the precinct that will manage drainage and water quality infrastructure requirements. Shenstone Park lies predominantly within the Merri Creek catchment area. There are existing DSSs for the areas to the north of the PSP, while a DSS for the PSP is yet to be concluded.

Investigations have identified the requirement of seven retarding basins and wetlands within the precinct. Melbourne Water has identified initial scheme pipe and channel alignments.

Figure 9 – Existing drainage catchments



(Source – Cardo, Infrastructure Assessment)

9.2 Water supply

The water supply provider for Shenstone Park is Yarra Valley Water (YVW).

The precinct is within a Class A Recycled Water mandated area. Developers within the precinct will be required to reticulate both drinking water (DW) and non-drinking water (NDW) to all allotments. YVW has advised that the Class A water to the area, to be treated from the Wollert Recycled Water Treatment Plant.

Drinking water supply for development of the precinct can be provided from the existing Donnybrook/Woodstock distribution main in Donnybrook Road with the following 225mm diameter Donnybrook/Woodstock mains required for ultimate supply. Distribution throughout the precinct will be via water mains. The water mains will typically be accommodated within road reserves and the alignments are subject to change depending on the ultimate road network.

Non-drinking water supply for development of the precinct can be provided by extending trunk mains from the existing NDW main at Donnybrook Road. NDW water will also be distributed throughout the precinct via water mains. These water mains will also be accommodated within road reserves (but separate to DW mains).

The construction of the Donnybrook Road East Main will service the Donnybrook/Woodstock precincts in addition to Shenstone Park, and it is expected that development in these precincts will ensure the timely construction of this asset to make non-drinking water available to all three precincts.

Figure 10 – Drinking water infrastructure



(Source – Cardo, Infrastructure Assessment)

Figure 11 – Recycled Water Infrastructure



(Source – Cardo, Infrastructure Assessment)

9.3 Sewerage

The sewerage provider for Shenstone Park is also YVW. There is no existing sewerage infrastructure within the Shenstone Park precinct.

The sewerage outfall for the broader East Donnybrook region which includes the Shenstone Park, Donnybrook/Woodstock and Lockerbie precincts is the Amaroo Branch Sewer. This Amaroo sewer extends north from Craigieburn running parallel to the Sydney - Melbourne railway line and connects the region to the Melbourne sewerage system. Within the Shenstone Park precinct, the Amaroo Branch Sewer is located typically 15 m east of the railway reserve.

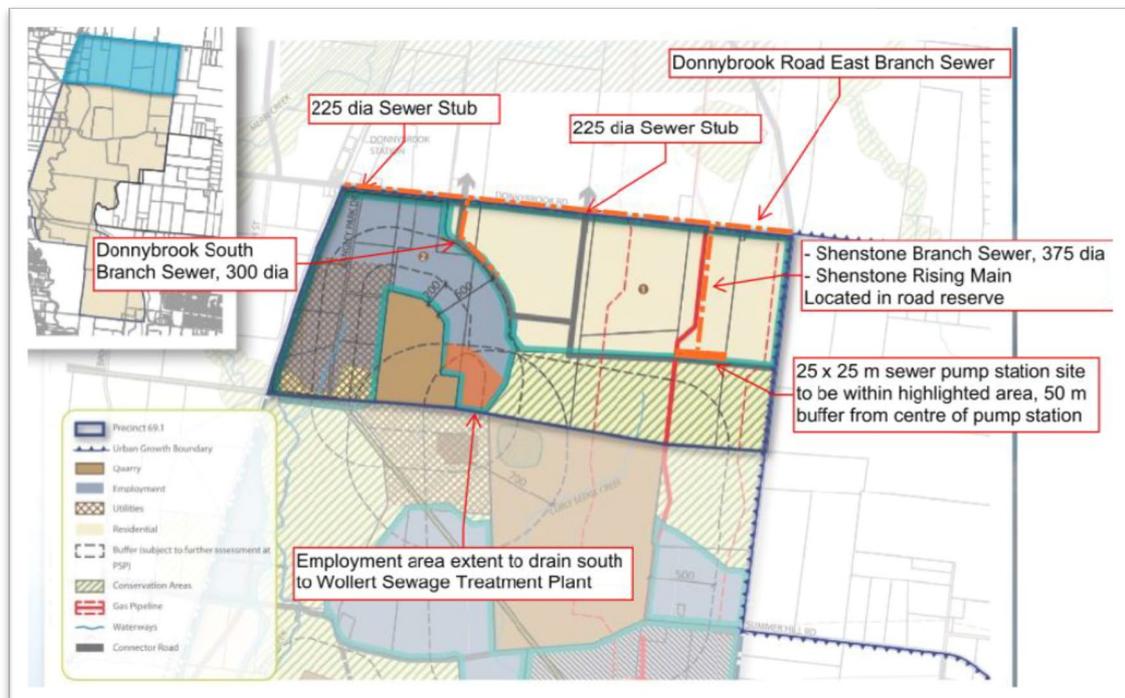
A sewer pump station will be required in the south east of the PSP developable area to service development in this area which is considerably lower than Donnybrook Road.

The other key YVW sewerage asset proposed to service development in this region is the Wollert Sewerage Treatment Plant (STP). This facility will be located outside the Shenstone Park precinct. The purpose of the STP is to remove volume from sewer discharges which will be treated to Class A recycled water standard. The balance of flows including solids will be discharged to the Amaroo Branch Sewer. The core STP facility is proposed to be located in land directly to the south of the quarry (outside of the Shenstone Park precinct), with storage lagoons proposed to be located in properties abutting Langley Park Drive.

GHD have undertaken a review of the likely buffers associated with the STP, but given that the facility is unlikely to be in operation until 2025, qualitative assessments were not able to be conducted. However, for the purposes of the Shenstone Park PSP, GHD mapped a potential scenario how the local meteorology on the site would impact upon the default odour buffers set out by the EPA in their publication 1518 (*Recommended Separation Distances for Industrial Residual Air Emissions*). Given the proposed location of the STP there is the potential for the directional buffer to further encroach into developable area of the Shenstone Park PSP. The FUS has been updated to reflect this scenario.

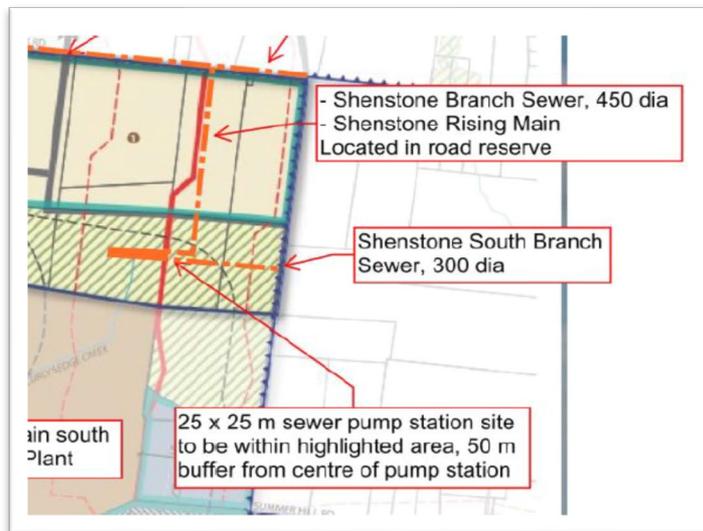
Further, as the proposed location of the STP is approximately 45m from the Woody Hill Quarry property boundary and 25m from the Phillips Quarry property boundary, the extent of blasting operations will need to be considered in the context of a future STP. The possible quarry expansion areas have been reduced to ensure that the STP can be developed in this location, however management strategies and timing arrangements may be able to allow both stone extraction and the STP to occur in proximity to each other.

Figure 12 - Sewer Infrastructure



(Source – Cardo, Infrastructure Assessment. Plan from the Northern Quarries Investigation Area Addendum)

Figure 13 - Sewer Infrastructure for reduced conservation area



(Source – Cardo, Infrastructure Assessment)

9.4 Electricity Supply and Transmission Infrastructure

The responsible authority for the provision of electricity supply facilities within Shenstone Park is AusNet Services.

Ausnet has advised that the existing overhead power lines located on the northern side of Donnybrook Road include both a 66kV circuit and a 22kV feeder rated line which is supplied from the Kalkallo zone substation located on the north-west corner of the Hume Highway/Donnybrook Road interchange. The 22kV feeder line has capacity to supply initial development of the precincts to the north and south of Donnybrook Road.

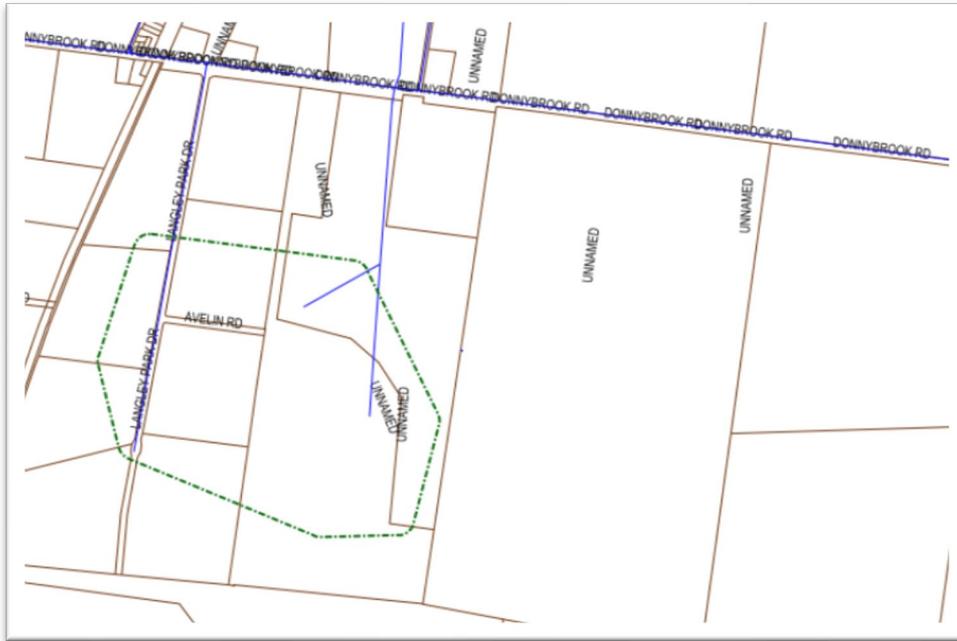
A second 22kV distribution feeder line will be required to be extended from the zone substation along Donnybrook Road in the medium term to cater for the loads of further development. This will be installed underground as the existing pole line in Donnybrook Road is at capacity.

The zone substation has capacity for 12 feeder lines with 5 currently in use and a sixth about to be energised. Ausnet require 12 to 18 months lead time for feeder installation and need to monitor load growth to ensure that augmentation of their network is appropriately programmed to cater for demand.

It is expected that the overhead power lines servicing the quarry and in Langley Park Drive will be replaced with underground cables as development in these areas progresses.

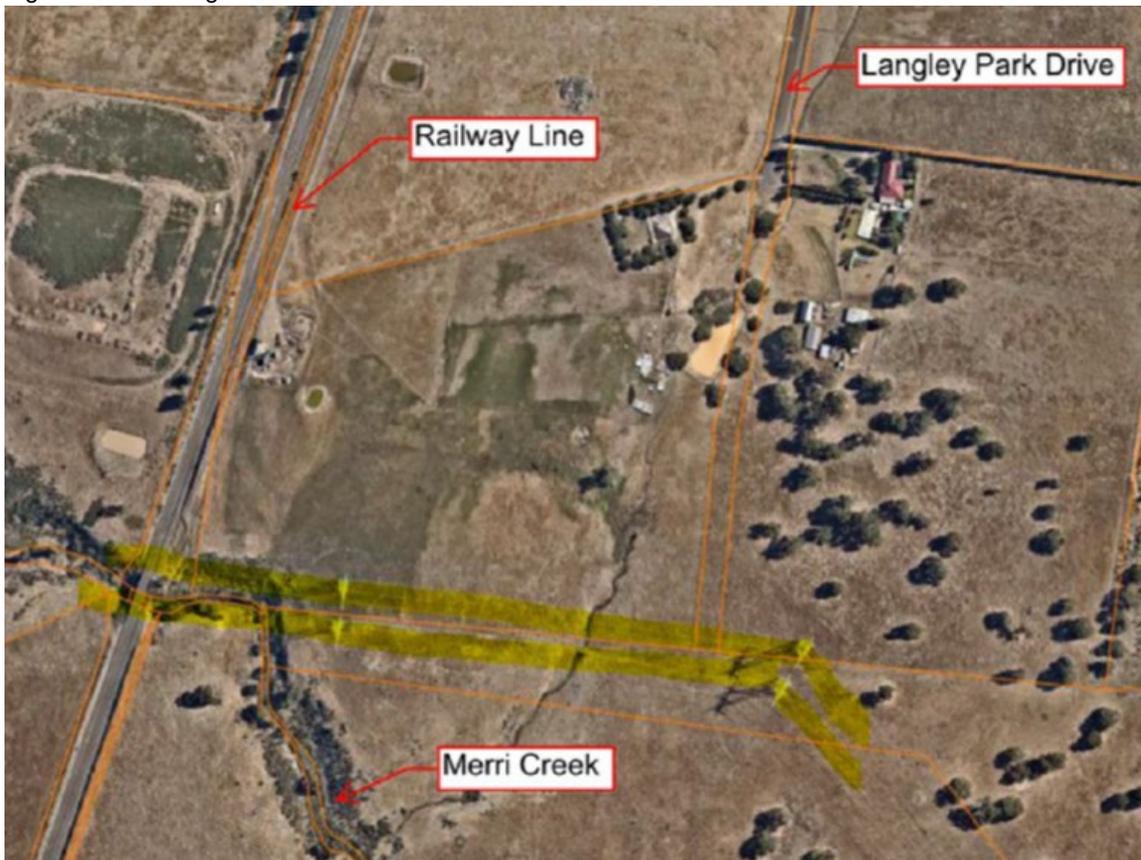
The electricity easement in the south-west of the precinct will be zoned Special Use Zone, to recognise the public asset.

Figure 14 – Existing overhead Electricity



(Source – Cardo, Infrastructure Assessment)

Figure 15 – Existing Power Transmission Lines



(Source – Cardo, Infrastructure Assessment)

9.5 Gas Supply

The responsible authority for the provision of gas supply facilities within Shenstone Park is APA Group. There is an existing APA transmission pressure gas main which traverses the eastern section of the Shenstone Park area. Adjacent to the gas main on Donnybrook Road a city gate has been constructed to reduce gas pressure so that it is suitable for distribution and reticulation.

An existing 300mm diameter gas distribution main extends west along Donnybrook Road from the city gate across the full frontage of the precinct and further west, located in the existing northern verge adjacent to the potable water distribution main. Gas supply for the precinct will be provided from the existing 300 mm diameter gas distribution line in Donnybrook Road.

A Safety Management Study (SMS) may be required to assess the risk associated with the change in land use within the measurement length (ML) proposed under the PSP. The SMS will also develop appropriate controls on development to reduce risks to as low as reasonably practical.

APA has advised that the city gate is typically a noisy facility and that noise mitigation may be required to ensure that any future nearby development is not impacted upon. As such they recommend that an acoustic assessment of the facility be undertaken during peak operating conditions to allow consideration of the best method of noise mitigation which may include buffers or noise walls.

Figure 16 – Existing Gas Transmission Pipeline and Existing Citygate



(Source – Cardo, Infrastructure Assessment)

9.6 Telecommunications

Telstra are the incumbent authority for telecommunications in the area with existing cables providing supply to the rural properties. NBN Co is the provider of last choice for telecommunications to the precinct, however developers have the option of obtaining this service from other licensed telecommunications providers.

Existing Telstra underground cables are located on the south side of Donnybrook Road extending approximately 500 m to the east of Langley Park Drive, and on the west side of Langley Park Drive. Overhead Telstra cables extend west along Donnybrook Road from this location.

Nextgen telecommunications cables run roughly parallel to the railway line just within the precinct, extending south from Donnybrook Road for approximately 800 m before crossing the railway reserve at Norman Road.

NBN Co has confirmed that the precinct is within their fibre footprint, and that telecommunications facilities can be provided to the precinct without the need for any excessive new infrastructure.

10 TRANSPORT & MOVEMENT

10.1 Road Network

GTA consultants were engaged to undertake the strategic transport modelling to determine the anticipated demand on the transport network. The report outlines the land use inputs, assumptions and resultant transport demands for the proposed road network.

The transport modelling of the PSPs was carried out using the Victorian Integrated Transport Model (VITM) and considered the associated works for Donnybrook Road approved with the Donnybrook/Woodstock PSP. It concluded that Koukoura Drive would ultimately be required to be a dual carriageway secondary arterial, as in Donnybrook/Woodstock PSP.

10.2 Pedestrian and Cycle Network

The pedestrian and cycle network has been completed in line with Council's Open Space Strategy and Bicycle Strategy, as well as considering natural features and infrastructure opportunities (such as the gas pipeline and the railway line). The PSP guidelines have also been addressed in designating off-road and shared paths, and on-road cycling ways.

10.3 Bus Services

The street network has been designed to support the future provision of a bus network for the Shenstone Park PSP. In addition, bus priority measures have been factored into the ultimate design of Koukoura Drive and intersections where Public Transport Victoria (PTV) have required them.

10.4 Rail Services

Shenstone Park will be serviced by the Donnybrook Station located immediately north-west of the precinct. Land has been set aside within the Donnybrook PSP to accommodate the future upgrade of the station. Some car parking associated with the railway station will be provided in Shenstone Park, adjacent to the YVW pipeline easement off Langley Park Drive. As the area develops, parking at the station will be designed to minimise off site impacts on adjoining developments.

11 TOPOGRAPHY & LANDFORM

The Visual Character Assessment has been prepared for the VPA and the City of Whittlesea Council to identify existing visual features within the Shenstone Park PSP area. The report provides recommendations as to how to sensitively integrate these features into future urban development.

11.1 Visual character analysis

The visual character analysis rated visual character elements as possessing higher retention value when co-located or linked with one or more other visual elements. Individual visual character elements were deemed to have high retention value based on both strong visual character and/or heritage value.

Shenstone Park PSP area has been divided into two visual character sectors (east and west) to allow closer analysis of site-specific opportunities and constraints which were based on site features and land use. The following opportunities have been identified such as large woodland areas and areas with significant existing trees co-located with other visual elements like stony rises, dry stone walls and waterways. Strategic links that provide opportunities for physical and visual links between key visual character elements, for example via roads, linear open space reserves and infrastructure elements. Priority of dry-stone wall retention based on co-location with other visual character elements and opportunities for links within open space reserves, shared path links and road reserves. Where possible where heritage sites are retained and/or repurposed to retain existing character. Careful consideration of development where scattered trees and windrows exist to ensure positive interfaces.

11.2 Landscape characterisation

The *City of Whittlesea Rural Review (2000)* identifies the PSP area as part of the western plains landscape character area which consists of the woodlands, plains and basalt flows. The report identified the main characteristics of the study area and its different key features. The precinct is in a predominantly rural setting, made up of cleared pasture land of varying topography and use.

Shenstone Park has a distinct character with defining landscape features that a generally flat landform includes clusters of native river red gums, windrow planting, stony rises and waterways, views to Mt Frazer, Kinglake National Park and the city are also available from various vantage points. There are a number of dry-stone walls and heritage structures within the precinct that provide a direct link to the historical rural uses in the area and add to the visual interest and cultural identity of the precinct.

11.3 Visual character elements

The visual character elements of the study area are categorised into seven key elements looking at the trees, stony rises, heritage places, dry stone walls, waterways, infrastructure and the hills.

The river red gums are signature trees of the local area with high retention value and form landmarks within the landscape, as a result they offer a key opportunity for creating a sense of place in Shenstone Park.

Stony rises are a distinctive feature of the Western Plains landform. These features were formed by basalt lava flows and are visually present by irregular shaped forms. A large number of stony rises have been identified within the PSP area and vary from 20m to 300m in length. The stony rises have value due to their natural occurrence and uniqueness to this area as they provide a natural structural element in the landscape by breaking up the generally flat landform. Their retention in an urban setting can assist in defining spaces and adding variety and providing development break, particularly when incorporated into open space areas. Stony rises often support remnant vegetation and have retained environmental values due to difficulty utilising their area for farming. River red gums are often co-located with stony rises which also provide habitat and shelter for small animals.

The PSP area contains a number of built elements that have heritage value and visual interest. The heritage elements identified include a series of dry-stone walls, blue stone buildings and stockyard remnants. The character of heritage places contributes to the local identity and provide important visual links to the past, often forming local landmarks and retain the cultural identity of the area.

The most prominent heritage element within the PSP area is the farm holding at 1030 Donnybrook Road named 'Shenstone Park'. The farmstead comprises a mix of outbuildings and stockyard remnants, setback approximately 60m from the road, with a modern built dwelling immediately to the east. The main milking shed is a large corrugated iron structure with a double pitched roof and bluestone flooring that opens towards the south. A series of dry-stone walls are found on the property and vary from 1.1-1.2m in height and 15m in length.

Dry stone walls are commonly used to delineate property and paddock boundaries. They were constructed using carefully placed local basalt stones without mortar. The stones were locally sourced from loose rock on the stony rises and basalt stone floaters found in paddocks. A network of dry stone walls exist within the PSP area creating a strong linear element within the landscape. Wherever possible, the dry-stone walls should be retained as contributory elements within local heritage places which adds to their character and heritage value.

Waterways within Shenstone Park have limited direct visual impact as drainage areas are sparsely vegetated resulting in a largely exposed landscape. Waterways provide important ecological, cultural, aesthetic and recreational component of the landscape. They can become a vital environmental asset and help facilitate habitat links between larger conservation sites recognised for retention within the wider area.

Woody Hill is a very prominent feature located towards the western end of the PSP area and being 270m above sea level, Woody Hill is visible from most vantage points and is a reminder of the past geological activity in the area. At the top of the rise is a large depression associated with the extractive industry operation at Woody Hill since the 1980's extracting mostly a sand stone type material. Although Woody Hill has been significantly modified through the quarry activity, it does have value due to its natural occurrence as it provides an elevated element in the landscape breaking up the generally flat landform.

In a developed setting Woody Hill will continue to be excavated until the hill is levelled with the adjoining land. Prior to its levelling, Woody Hill can assist in creating a legible focal point for the site. However, development of the site during this time will be limited due to impacts from the operations of the quarry. Once levelled, the area that previously encompassed Woody Hill can be incorporated into adjacent development, as its height provides an opportunity to provide for open space.

The Woody Hill Quarry located within the western section of the PSP area is a dominant visual character element. The earth mound associated with the quarry rises significantly above the landscape forming a strong visual link. The buffer surrounding the quarry provides a more gradual interface. The quarry provides a valuable industry function but has generally lower quality visual character which will need to be managed in an urban context. An existing gas pipeline and easement exist within the east of the site. The easement will increase in visibility once subdivision occurs as no development may occur within the easement, however there is an opportunity to provide for linear open space links across the PSP area. There is an existing city gate that will require appropriate screening to minimise visual impact that the infrastructure will have on future subdivision.

11.4 Opportunities and constraints

This section of the report looks at identifying which landscape areas need to be considered in the development of the PSP through categorising those landscape values that are most preferred and least preferred. It is recognised that landscape values vary from person to person, and has used a set of broad landscape character preference indicators.

Shenstone Park West – explore the following opportunities and constraints:

- Elevated parts of the site with views should be explored for passive open space opportunities.
- Investigate ways to incorporate and link open water bodies with adjacent visual character elements.
- Retain existing sections of dry-stone walls in open space and along road reserves where possible.

- Existing river red gums must be incorporated in the subdivision layout to enhance visual character and place making opportunities.
- Links to various visual character elements should be enhanced where possible through any future subdivision layout.
- The subdivision layout will need to appropriately respond to the existing railway interface.
- Areas and land uses adjacent to quarry uses and areas for servicing requirements should explore sensitive design treatments to enhance and protect visual character elements.

Shenstone Park East – explore the following opportunities and constraints:

- Opportunities to provide strategic links along existing creek corridors.
- Elevated parts of the site with views should be explored for passive open space opportunities.
- Links to various visual character elements should be enhanced through any future subdivision layout.
- Existing river red gums and windrows must be incorporated in the subdivision layout to enhance visual character and place making opportunities.
- Retain existing sections of dry stone walls in open space and along road resources where possible.
- Convergence of multiple character elements including stony rise, dry stone wall and topography elevation presents an opportunity to emphasise it spatially.
- Subdivision layout will need to appropriately respond to future arterial road and City Gate interfaces.

11.5 Outcomes and Recommendations

Retaining visual character elements and preserving their physical and visual linkages greatly enhances local identity. The recommendations are based on the site analysis undertaken as part of this report, identified opportunities and constraints, key place making opportunities, review of case studies including identified opportunities and issues that can be captured or avoided and a review of policies and strategies including development within the City of Whittlesea.

Key recommendations:

- Establish a strong sense of place by responding to and enhancing the visual character of the precinct.
- Retain, protect and integrate visual character elements where possible.
- Conserve and enhance identified key place making opportunities.
- Physically and visually link features where possible to retain a sense of the broader landscape character.
- Retain an appropriate setting and context for heritage places.
- Encourage the creation of distinct neighbourhood identity by integrating existing visual character features within local centres.
- Retain views where possible.
- Protect and enhance waterways and associated open space opportunities.
- Locate the open space network to preserve visual features.

12 BIODIVERSITY AND ARBORICULTURE

12.1 Biodiversity Conservation Strategy

The Biodiversity Conservation Strategy (BCS) was approved by the Minister for Environment, Heritage and Water in September 2013. The BCS provides strategic direction for the retention and removal of Matters of Natural Environment Significance (MNES). The BCS was amended in July 2017 following a period of consultation.

Conservation Areas 28 and 34 are within Shenstone Park PSP. Located along the southern boundary of the precinct, the total of Conservation Area 28 is 331.12 hectares, of which 69.5 hectares is located within the Shenstone Park PSP. The area is characterised by nature conservation and open space containing predominantly scattered trees.

The key rationale for Conservation Area 28 is the protection of River Red Gums, Plains Grassy Woodland and Plains Grassland ecology. Alluvium have been engaged by Council on behalf of the VPA to study the relationship between the Conservation Area 28 and the Shenstone Park PSP.

Conservation Area 34 is for the protection of Growling Grass Frogs along the Merri Creek.

12.2 Vegetation Values:

An assessment was undertaken to assess the environmental values within the Shenstone Park PSP area and the adjoining Biodiversity Conservation Area 28 (CA 28). The Biodiversity Conservation Area is zoned as a rural conservation zone primarily due to the prevalence of River Red Gums. Other factors within the assessment are the Woody Hill Quarry, the proposed Yarra Valley sewage treatment facility, Phillips Quarry immediately to the south of the study area and the gas pipeline easement. The objectives of the project are to determine the geomorphic condition, values and trajectory of the designated waterways, identify native vegetation within waterways, provide recommendations on the type of waterway management activities required to minimise the impacts of urban development and identify significant native vegetation and ecological communities with the CA28 area.

The native vegetation within the study area is restricted to isolated patches and scattered trees primarily in the south of the PSP area and throughout CA28. Vegetation present include grassy woodland, creek-line tussock grassland, stony knoll shrubland, plains grassy wetlands, plains grassland, modified indigenous wetlands and exotic pastures.

The majority of the precinct and adjoining conservation area has been cleared of native vegetation due to persistent agricultural activity, however remnant communities and trees still remain in places.

12.3 Ecological and Geomorphic Values:

An assessment was undertaken to consider the potential impacts on significant vegetation and habitat along the existing waterways and within the CA 28. Waterways drain the study area such as the Merri Creek tributary, Darebin Creek tributary and Curly Sedge Creek.

The recommendations of the assessment aims to ensure adequate protection of the ecological values along waterways and throughout CA 28. The assessment provided a series of ecological recommendations as follows:

- Protection and rehabilitation of the Plains Grassy Woodland within the 100-year flood level extent;
- Protect and manage the area of modified indigenous wetland within reach 3 of the Merri Creek tributary;
- Protect and rehabilitate and manage the area of Creekline Tussock Grassland associated with the Curly Sedge Creek;
- Develop waterways with low ecological values into constructed waterways.

The geomorphic recommendations are as follows:

- Protect and manage reach 3 of the Merri Creek tributary as a remnant stream type that is locally rare, intact and provides diverse physical and hydraulic habitat;
- Protect and manage the intact valley fill in Curly Sedge Creek.

12.4 Hydrological values

A hydrologic regime assessment was undertaken to consider the potential impacts on significant vegetation and habitat along the existing waterways and within Conservation Area 28 and develop recommendations for ideal watering conditions. Significant areas of vegetation were identified within the 100-year flood extent in the study area such as 'Plains Grassy Woodland' along the lower section of the Merri Creek tributary and 'Creekline Tussock Grassland' vegetation community along Curly Sedge Creek.

The distribution and composition of key vegetation species at each location is well correlated to both the geomorphology and hydrology of the site. The grass dominated communities at each site suggest that much of the 1 in 100-year flood extent only experiences periodic inundation. The hydrological modelling clearly indicates that under post development conditions waterways within the study area will carry more water than under current conditions. Most of the riparian species within the significant vegetation communities are adapted to wetter conditions being able to withstand frequent inundation for extended durations.

The recommendation provides that the vegetation communities associated with the Shenstone Park PSP and Conservation Area 28 waterways are considered to be relatively water tolerant and unlikely to be significantly impacted by the frequency of inundation. There may be minor alterations to community structure which are anticipated under post-development hydrological regime, they are unlikely to lead to the degradation of wholesale change of the vegetation community.

Should localised ponding occur due to the increase in duration of inundation, significant impacts to native vegetation associated with the Curly Sedge Creek and lower reach of Merri Creek tributary are considered likely. It is considered important to ensure that during the development phase that no physical modifications are made in these reaches that will increase the duration of inundation.

To better understand the likelihood of the localised ponding and associated impacts on vegetation communities, pre-development hydraulic modelling and monitoring of the sites is recommended.

12.5 Bushfire Threat and Management Issues and Actions

Land within the precinct is at some risk of bushfire, however, the risks can be managed with appropriate development controls. The bushfire risk does not present significant obstacles to development.

The Country Fire Authority (CFA) does not have any Fire Station infrastructure within the precinct or adjoining areas. Provision has been made within the Lockerbie and Donnybrook/Woodstock PSPs to provide these facilities. Nonetheless, in the interim the CFA will be looking to provide fire suppression services from outside the precinct area.

Development of the PSP will increase the fire threat of the Shenstone Park area and contributes to other requirements for additional infrastructure (upgraded appliances), increased demands on members, including training to meet this increased risk.

Terramatrix have undertaken a study of the area to determine the most appropriate response to bushfire threat and have recommended a 19m buffer along the BCS areas (which area also Bushfire Prone Areas), to protect against bushfire threat. Reticulated water and an interface road will also be required to manage the threat. The BCS already requires a 20m buffer between the BCS and the property boundary, so these requirements will be combined and a 20m buffer will be provided.

12.6 Conservation Reserve Boundary Changes

The Biodiversity Conservation Area (BCS), Conservation Area 28 was designated as an open space conservation area based on estimated data. The BCS outlines DELWP's intention to finalise the boundaries

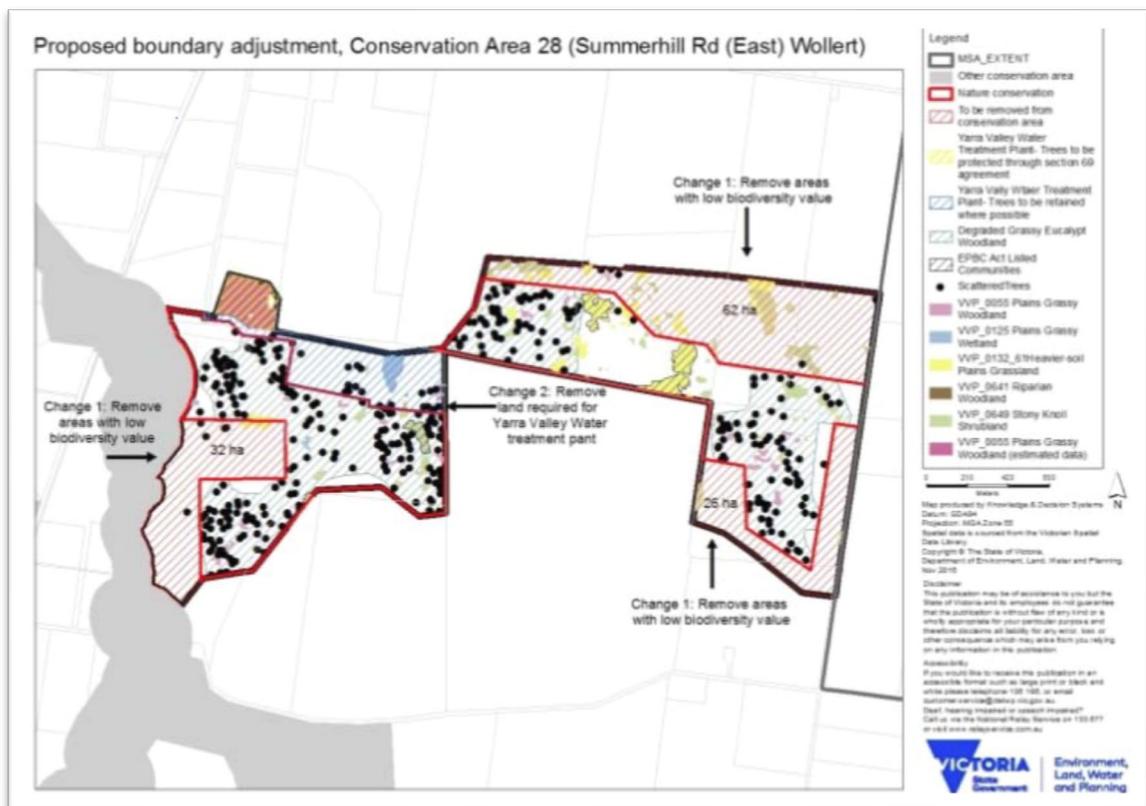
of the conservation area following on ground surveys. On ground surveys were conducted and the survey data was analysed against the appropriate boundary change criteria. The boundary change focuses on areas of high biodiversity value. The boundary changes results in the removal of 5.12 hectares of native vegetation which is dominantly low quality Plains Grassland.

The total of Conservation Area 28 is 331.12 hectares and is split between the east and west areas. The proposed conservation area that applies to the Shenstone Park PSP has been reduced to 69.5ha. Conservation Area 28 is an open space area that has been reduced as follows:

- Removes 145.15 hectares of land from the conservation area;
- Removes an existing house from the conservation area;
- Removes land required for Yarra Valley Water treatment plant;
- Removes 5.12 hectares of native vegetation;
- Removes no matters of National Environmental Significance (MNES) listed under the EPBC Act; and
- Removes 28 scattered trees from the conservation area. Some of these 28 trees may still be protected within the Yarra Valley Water treatment site.
- The areas to be retained within the conservation area have been classified for nature conservation.
- The Minister for the Department of Environment and Energy approved the boundary on 12 July 2017.
- Habitat compensation fees apply to land approved to be removed from the conservation area.

Source – Department of Environment, Land, Water and Planning, Melbourne Strategic Assessment website

Figure 17 - Proposed boundary adjustment, Conservation Area 28 (Summerhill Rd (East) Wollert)



Source – Department of Environment, Land, Water and Planning, Melbourne Strategic Assessment

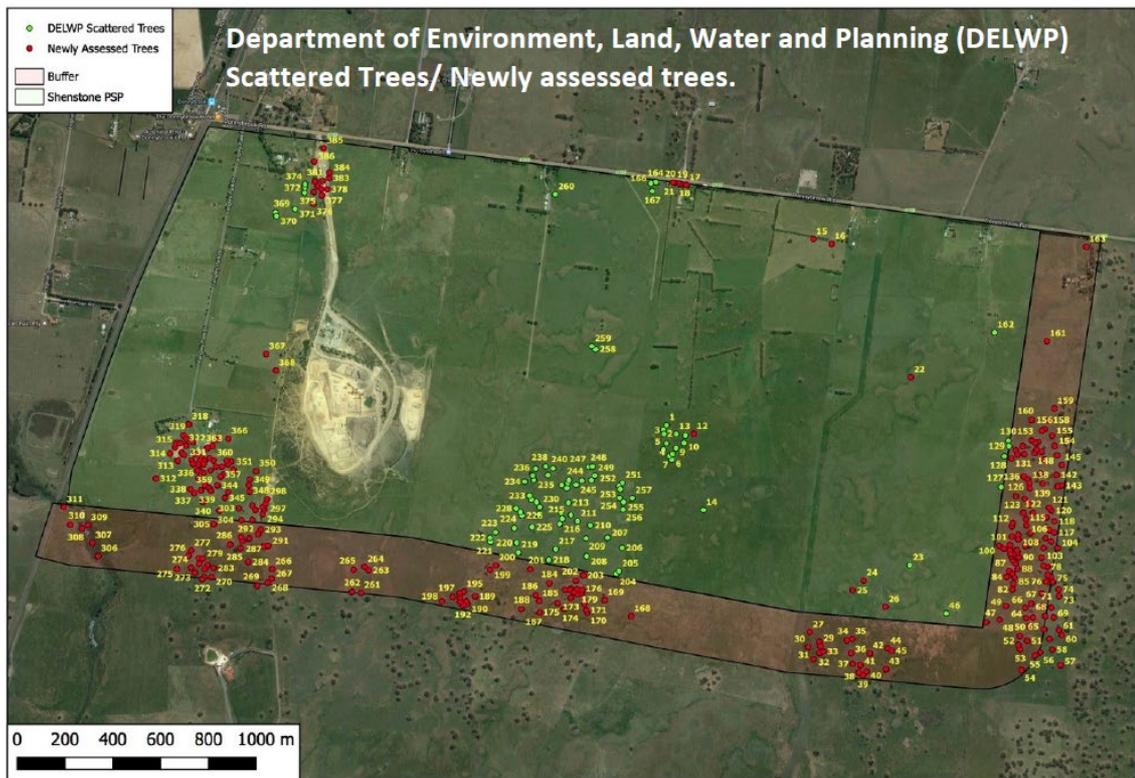
12.7 Arboricultural Report

TreeTec were engaged to undertake a preliminary arboriculture and scattered tree assessment for the Shenstone Park and adjoining land within 50 metres of the PSP boundary to assess and map trees of high and or very high arboriculture retention value and landscape value that had the potential to be retained as part of a future urban structure. The study area included the trees identified within the Biodiversity Conservation Strategy (BCS) and a review of DELWP time stamped data.

The assessment identified 379 trees within the study area as having high or very high Arboriculture Retention Value (ARV). An additional seven trees were identified as having medium ARV, these trees have been included to provide an indication of the boundary between High and Medium ARV. The dominant tree was the River Red Gum, there were others including non-indigenous native and native species.

Potential tree retention recommended that all trees should be considered during the initial design stages of the site subdivision, and adequate space allocated to higher value individual trees and clusters of trees to avoid development related impacts. Where trees or groups of trees are to be retained, this should be done in accordance with the City of Whittlesea Tree Protection policy.

Figure 18 – Area of assessed trees



(Source, Treetec Report February 2017)

13 TOWN CENTRES AND EMPLOYMENT

The Shenstone park Future Urban Structure (FUS) identifies the location for a local town centre and two local convenience centres. As a part of the planning process, Urban Ethos was engaged by the City of Whittlesea and the VPA to prepare an Economic Assessment report that provides advice on the appropriate size and location of retail activity centre(s) in the precinct and on the contribution that those centres are likely to make to the provision of jobs for local residents.

The report estimated that a local town centres would be required to service the community. This corresponds with the future urban structure (FUS) in the draft PSP that shows a local town centre and two local convenience centres serving the area.

13.1 Local Town Centre & Employment

Local Context

The hierarchy of activity centres in the northern growth corridor is established within the *North Growth Corridor Plan*. The network of town centres planned for the precincts surrounding Shenstone Park are:

- A **Principal Town Centre (PTC)** within Lockerbie, north-northwest of Shenstone Park.
- A **Major Town Centre (MTC)** within Wollert, to the south-east of Shenstone Park. MTCs provide a wide range of goods and services, underpinned by multiple supermarkets and discount department stores. A diversity of services, commercial and entertainment uses co-located with these major stores, serving a sub-regional catchment and supporting multiple suburbs and/or communities.
- **Local Town Centres (LTC)** are planned to be developed within the Lockerbie, Donnybrook and Woodstock precincts. LTCs provide for day-to-day and weekly needs, with a supermarket and supporting retail, commercial and community uses. Local town centres create a focus for social interaction within communities.
- **Local Convenience Centres (LCC)** are generally co-located with schools, community centres and open space in residential areas. These centres supplement the higher order centres in providing for day-to-day needs offering basic goods and services.

The employment precincts of Amaroo Business Park and Craigieburn North Employment Area are located to the south-west of Shenstone Park within the City of Hume.

13.2 Local Town Centres

A catchment analysis shows that, at full development, the local town centre will be serving the Shenstone Park precinct, which will be for approximately 10,000 to 11,000 people. The centre will comprise of 6,000sqm of retail floorspace and 2,500sqm commercial/office floorspace can be supported in a location that is central to the PSP area. The Local Town Centre (LTC) will be anchored by a full-line supermarket for the residents, as well as other retail, commercial and community services. In addition, to the east of the PSP area, potential may exist for a Local Convenience Centre (LCC) and one in the west comprising 1,200sqm and 700sqm of retail and commercial floorspace respectively.

The catchment analysis conducted by the report suggests that a town centre will be needed within the current network of activity centres. Furthermore, without the local convenience centre many residents will be greater than 2.5 km distance from a food and grocery service which doesn't align with the 20-minute neighbourhood objective.

A gap in the network is present in the north-eastern part of the precinct, where some residents are much more than 1 kilometre from any shops. This poses the need for a local convenience centre, which could take the form of a convenience store to provide top-up groceries and coffee shop.

13.3 Employment

The FUS identifies approximately 131ha of employment land which is located in the western portion of the precinct and within part of the broader region which provides for a considerable amount of employment land. The land designation is considered appropriate for employment uses having regard to the direction and land uses set by the Northern Growth Corridor Plan, its exposure to Donnybrook Road and proximity to the Donnybrook station and adjoining planned commercial precinct to the west and in addition to the major transport routes.

The northern part of the employment area within Shenstone Park has been designed with direct frontage to Donnybrook Road (23.5ha) with the potential to accommodate business uses such as bulky goods stores, restricted retail and showroom development. This area is located within close proximity to the employment land within the English Street PSP commercial precinct.

The eastern employment area (40.1ha) will provide for a mix of light industry and commercial uses and will provide an interface with residential areas. The industrial areas to the south and west of the above-mentioned areas (and interfacing with the north and east flanks of the quarry) could accommodate transport and logistics as well as manufacturing (67.7ha).

When fully developed the employment area, the LTC and two LCCs would directly employ an estimated 4,500 people on an ongoing basis. While the Woody Hill Quarry is in operation, this number will not likely exceed approximately 3,500 jobs as 34.2ha of industrial land is inside the blast buffer and cannot be readily developed while the quarry is in operation.

The Northern Growth Corridor Plan (NGCP) identifies 100ha of land for employment / industrial uses. The Shenstone Park will continue to provide a similar overall extent for employment purposes, while also factoring in the need to accommodate quarrying and other operations and ensuring appropriate (i.e. industrial and utilities) land uses are designated within the quarry and other buffers.

Table 1 Dedicated Employment Land Summary

Type of uses	Area (ha)
Business / commercial, light industry / industry outside blast buffer	~97 ha
Industry within blast buffer	~34 ha
Total dedicated employment	~131 ha

14 COMMUNITY INFRASTRUCTURE & OPEN SPACE

The VPA in conjunction with the City of Whittlesea (Council) undertook an *Community Infrastructure Needs Assessment* to understand the demand and type of community infrastructure and open space required to support the future residential population and workforce of Shenstone Park.

The assessment is based on adopted benchmarks and provision models, iterative discussions with Council and State Government departments, relevant external stakeholders and a review of technical reports as they relate to the development of the North Growth Corridor.

The configuration and locations of centres within the precinct areas take into account the local topography and the barriers to movement or access to community infrastructure.

In addition to natural and topographical constraints, a number of physical infrastructure and public utility easements that traverse the precinct impose some constraints on the location of community infrastructure and open space. These barriers are:

- Proximity to the quarry and buffers associated with the quarry activity and future wastewater treatment plant.
- Interface to the conservation area, quarry and wastewater treatment plant.
- Gas transmission pipelines (and associated buffers)

The Shenstone Park area will have sufficient population to warrant one local town centre and a range of community infrastructure.

The projected population of around 10,400 people (based on 18.9 dwellings per NDHa and long term 2.8 dwellings per household) is right on the 'tipping point' for the provision of particular community infrastructure between Level 1 and Level 2 facilities. The population is likely to be young families, people who have young children or are likely to be starting families in the coming years and in the shorter to medium term, household occupancy is likely to be closer to 3.1 persons per household, being reflective of current trends.

The Assessment identified that one multi-purpose community centre along with a combined neighbourhood house would be required for the precinct and that it would ideally be co-located with a government primary school as part of an integrated community hub. This centre will be suitable to accommodate the following services if designed appropriately: maternal and child health, kindergartens, child care, youth services, lifelong learning, community art, senior citizens clubs and cultural groups as well as being available to hire for community and private functions.

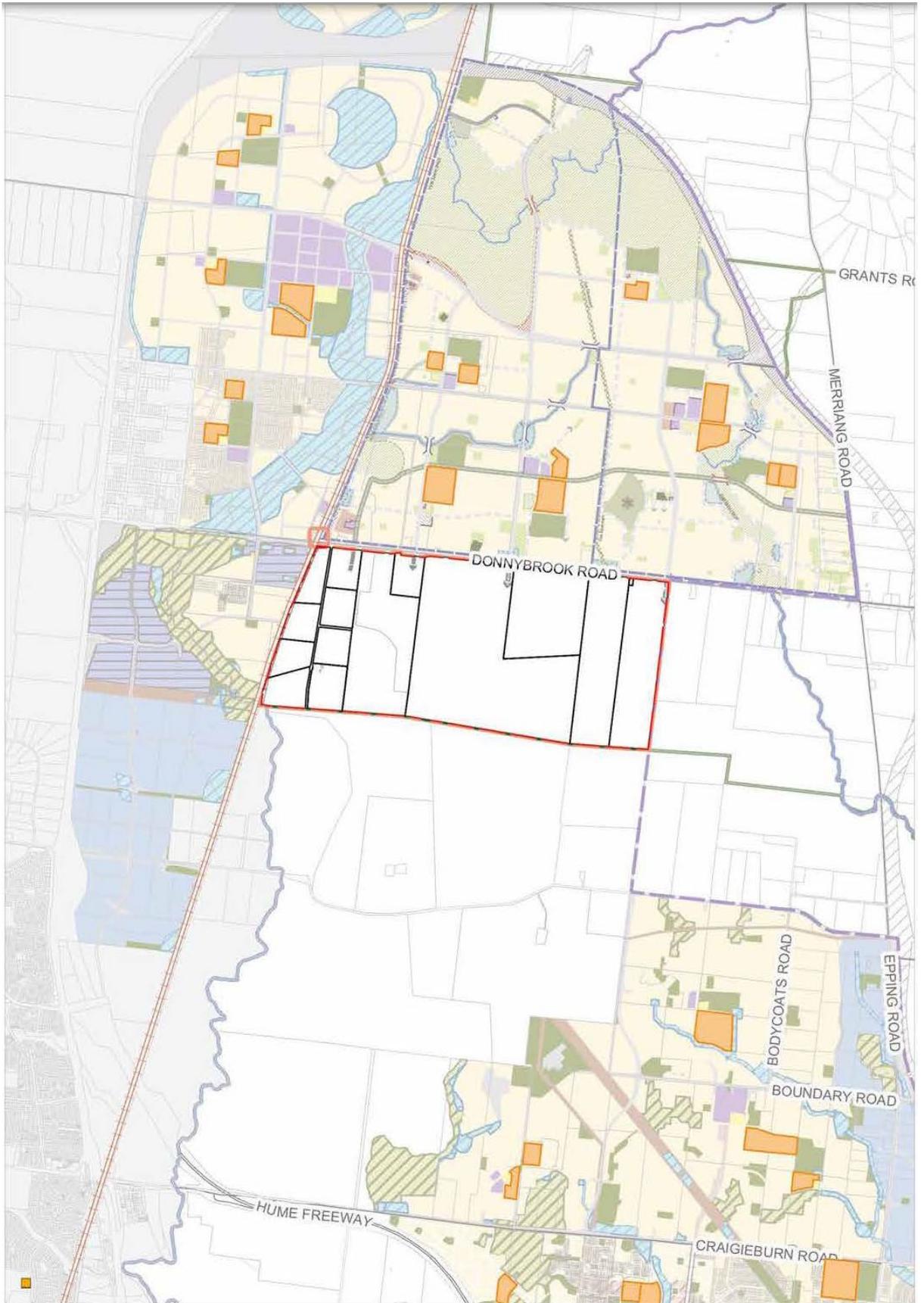
Consultation with relevant stakeholders also identified that for early years services, the following was required:

- Three kindergarten rooms in the interim and ultimately two in the long term.
- A single nurse maternal and child health consulting room facility.

14.1 Education

Shenstone Park will make provision for a 3.5 hectare government primary school adjacent to the local Town Centre based on the dwelling and population projections for the precinct. However there is not sufficient demand within the precinct to warrant provision of higher order education facilities (such as government secondary schools, non-government primary school and secondary school, and library) and these are instead provided within Donnybrook/Woodstock, which will also service Shenstone Park residents.

Figure 19 - Community & Education Catchment Plan



(Source – City of Whittlesea & VPA, Community Infrastructure & Open Space Needs Assessment)

14.2 Sports Reserves

All proposed sports reserves in the local region are to be provided adjacent to the government education facilities, to facilitate the potential for joint use of these sports reserves in future. The sports reserves will include grassed and hard courts and will take various configurations to cater for sports which currently have high participation rates such as Australian Rules football, soccer, cricket, netball and basketball. However, they will be flexible enough to cater for a range of sports which may become more popular in future, or that may be needed in the wider area. The specific type of sports facilities will be determined by future population needs.

Due to the primarily rural nature of the existing area, there are few current recreation assets in the precinct or surrounds. The only existing asset in place is the nearby Laffan Reserve which is located outside of the PSP within the City of Hume. It is located to the south-west of Donnybrook Station in the Craigieburn North Employment Area precinct.

The needs assessment prepared by the VPA and Council identified that around 8ha of land should be set aside for active recreation and could cater for any of the following sports (netball, Australian football, Soccer, cricket, tennis, hockey, netball, baseball, softball etc) depending on the communities need at the time of delivery.

Actual sports reserve provision proposed within the precinct is 8.45 ha to provide some further provision flexibility and in response to the projected dwelling yield.

The needs assessment also noted that an indoor recreation centre was not required for Shenstone Park as a commensurate facility will be provided in Donnybrook/Woodstock.

14.3 Local Parks

Generally, local parks should be equitably distributed across the precinct, maximising access by the local community and generating high amenity. Most local parks are proposed in sizes approximately one hectare, to cater for a diverse range of functions (i.e. gathering spaces, walking pets, linear connections, community focal points), and be located within convenient walking distance of 95% of all dwellings (400 metres).

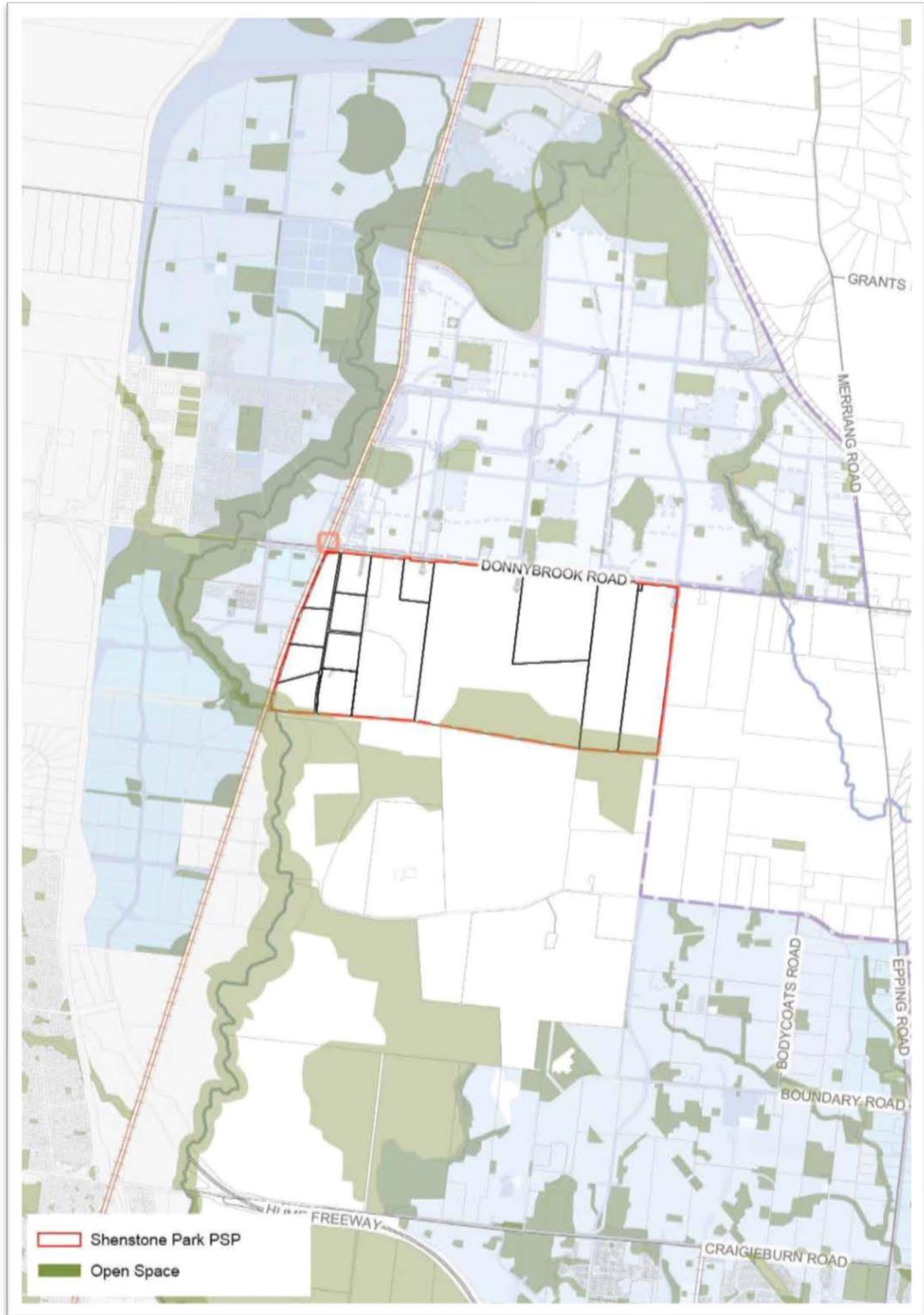
At the preparation of this report, 11.58 hectares of land is set aside for local parks at varying sizes across the residential and employment areas of the PSP area, and have been placed systematically to minimise walking distances exceeding 400m. A number of open space reserves are proposed to abut significant remnant vegetation, and historical features to connect people to the landscape and heritage features, whilst some other open space reserves are proposed to be co-located with active open space reserves and drainage assets to connect and make practical use of infrastructure assets.

Overall credited open space provision (inclusive of sports-fields and local parks) in residential areas (8.81% of NDAR) and employment areas (2.27% of NDAE) generally accords with the provision standards outlined by the PSP Guidelines.

14.4 Other Open Space

Precinct residents will also have access to other complementary (uncredited) open space via a unique network of waterways, easements and conservation areas. These aspects of the precinct will, with incorporated bike and pedestrian trails will serve a key role in linking the community and promoting active transport options.

Figure 20 – Open Space



(Source – City of Whittlesea & VPA, Community Infrastructure & Open Space Needs Assessment)

14.5 Emergency Services

Additional population growth in Shenstone Park may generate the need for additional emergency services and facilities. The number and type of facilities, timing of development and locations is determined by planning process undertaken by the Department of Justice and other relevant services.

There are a number of existing and planned emergency infrastructure items located within the local region. The VPA and Council will continue a dialogue with the emergency services agencies regarding future provision strategies and their short, medium and long term plans for the North Growth Corridor and how that will impact on all future PSPs.

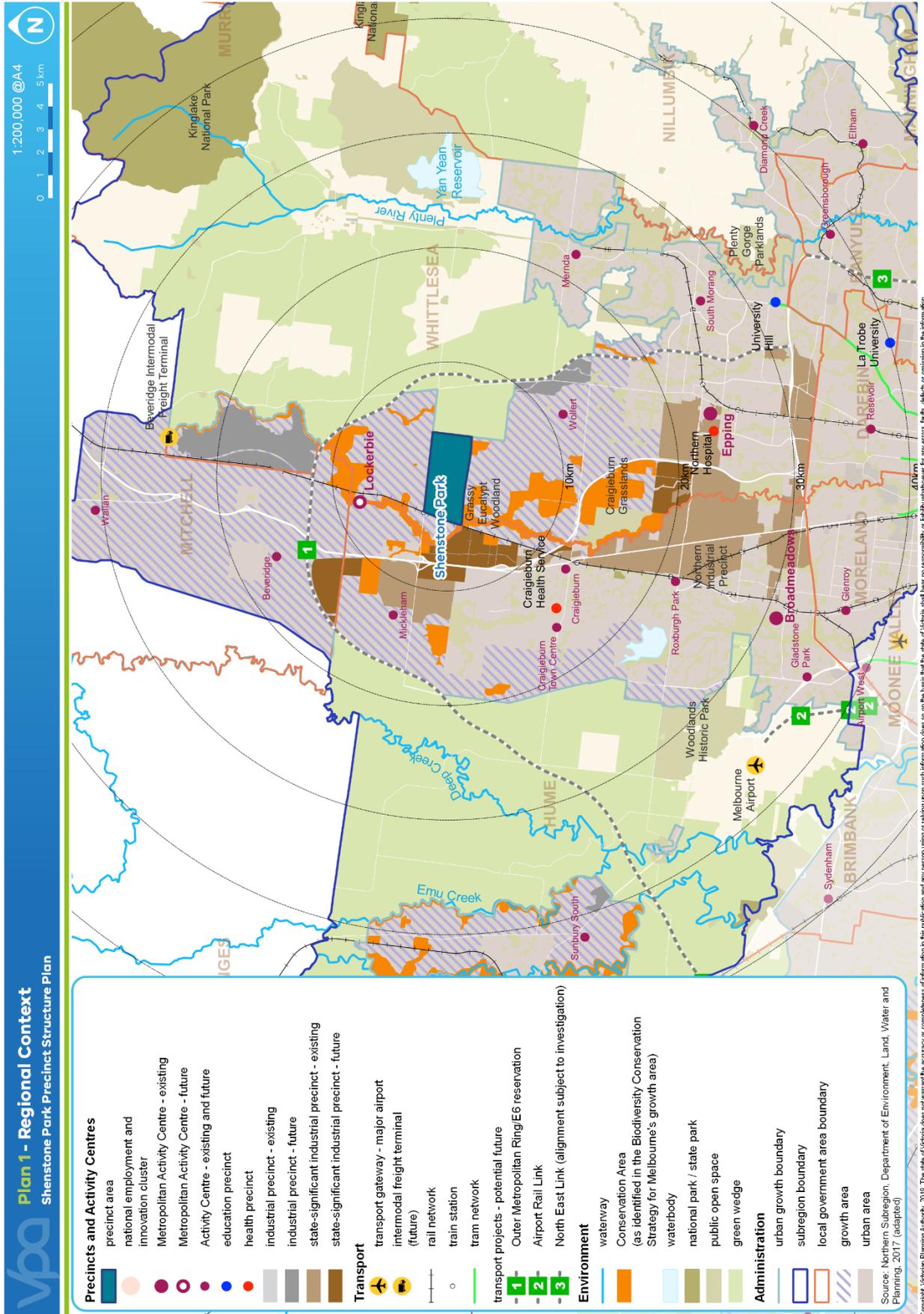
Planning for Community Infrastructure in Growth Area Communities makes a series of recommendations regarding the recommended service facility model, land area and building footprint requirements for emergency services facilities in growth areas, and key design issues / criteria, as follows:

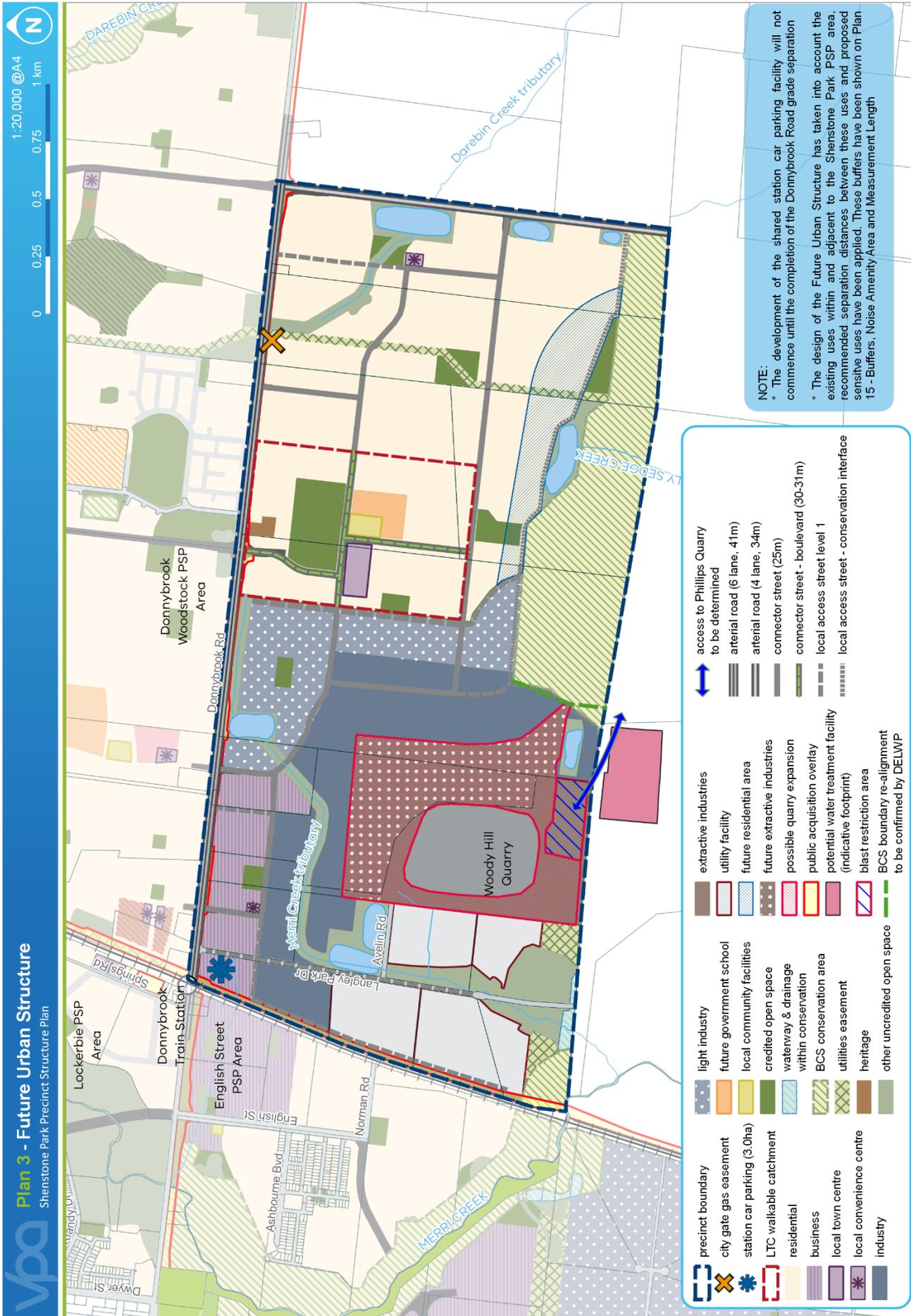
Recommended service facility model or growth areas:

- Additional population growth in Melbourne's growth areas will generate the need for additional emergency services facilities.
- The number and type of facilities, timing of development and location will be determined by planning process undertaken by the relevant services.
- The preferred facility model is often an integrated emergency services precinct comprising a police station, ambulance station, SES unit and/or fire station.
- Land area and building footprint requirements for growth areas:
 - Police – 0.4 ha to 0.6 ha
 - Fire and SES – 0.4 ha
 - Ambulance – 0.4 ha
 - SES Unit – 0.35 ha
- Key design issues / criteria:
 - The integrated emergency services precinct should have main road frontage, be easily accessible and be located so that it can achieve good emergency response times.

No particular facilities have been identified by the emergency services consulted during the PSP process, but these may still be identified as the areas start to develop.

15 APPENDIX





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