PRELIMINARY ENVIRONMENTAL ASSESSMENT

SOUTH JERRABOMBERRA INTEGRATED WATER CYCLE CONCEPT PLAN

AND

SOUTH JERRABOMBERRA INITIAL SERVICING INFRASTRUCTURE PROJECT APPLICATION

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CBRE TOWN PLANNING
CB RICHARD ELLIS

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EXECUTIVE SUMMARY

Village Building Company is proposing to develop a water cycle infrastructure network to service the South Jerrabomberra Release Area including the South Tralee precinct.

The proponent is seeking a concept plan approval for the provision of water and sewer related infrastructure within the wider release, and also project application approval for initial infrastructure necessary to facilitate the urban development of the South Tralee precinct.

The proposed development is consistent with and supports the planning objectives for the region articulated within the following key Government policy documents:

- *Sydney to Canberra Corridor Regional strategy 2007–31* (Department of Planning, 2008),
- *Queanbeyan Residential and Economic Strategy 2031* (Department of Planning, 2007) and Addendum Report (2008).

Land use and infrastructure needs planning for the release area, and South Tralee in particular is well advanced. Whilst the application for concept plan and project application approval is for water cycle infrastructure only, the provision of other critical infrastructure and the actual development of the subject land will be the subject of other planning approvals.

The proposed infrastructure will include a Sewage Treatment Plant and related infrastructure that is anticipated to cater for the treatment of wastewater and delivery of treated (re-cycled) water to approximately 28,500 equivalent population (EP) at an approximate cost of $100 million.

The Executive Director, under delegation from the Minister for Planning on 10 March, 2010 has therefore formed the opinion under clause 6 of the SEPP that the project is development of a kind that is described in schedule 1, clause 26 of the SEPP. The project is therefore declared to be a Major Project under Part 3A of the Environmental Planning and Assessment Act, 1979 (EP&A Act) and will be subject to determination by the Minister. The Minister has also authorised submission of a concept plan for the abovementioned proposal under Section 75M(1) of the Act.

South Tralee, North Tralee and the Poplars properties are the first stage release areas in South Jerrabomberra. Consistent with the *Queanbeyan Residential and Economic Strategy 2031- Addendum Report* (2008), the development is intended to ultimately comprise 4,685 dwellings, 136.5ha of employment lands, two commercial centres and associated development including a transport interchange, schools and associated recreation facilities.

This Preliminary Environmental Assessment provides a project description, preliminary issues and intended scope for the Environmental Assessment in order for the Director-General Requirements to be determined.

A number of environmental issues have been identified and will become the subject of more detailed investigations as part of the Environmental Assessment.

1. INTRODUCTION

1.1 Background

Land use and infrastructure planning for the South Jerrabomberra urban release area is required to occur consistent with the endorsed State Government *Queanbeyan Residential and Economic Strategy 2031* (the 'Endorsed Strategy'). Development in accordance with the Endorsed Strategy requires the provision of significant infrastructure including roads, water, sewerage, community facilities, parks and the like.

The Endorsed Strategy requires that, when fully developed, South Jerrabomberra provide for the following:

- Approximately 4,685 dwellings over a total area of 417.4 Ha.
- Approximately 136.5 Ha of employment land.
- Approximately 46 Ha of community land for facilities such as a site for regional sporting complex.
- Commercial centres to be located at South Tralee and Poplars

Infrastructure and land use planning has progressed to the point where approvals are now sought for overall integrated water cycle infrastructure provision for the wider South Jerrabomberra release, and also initial servicing infrastructure to allow development to occur in the first stage precincts, known as South Tralee, North Tralee and the Poplars.

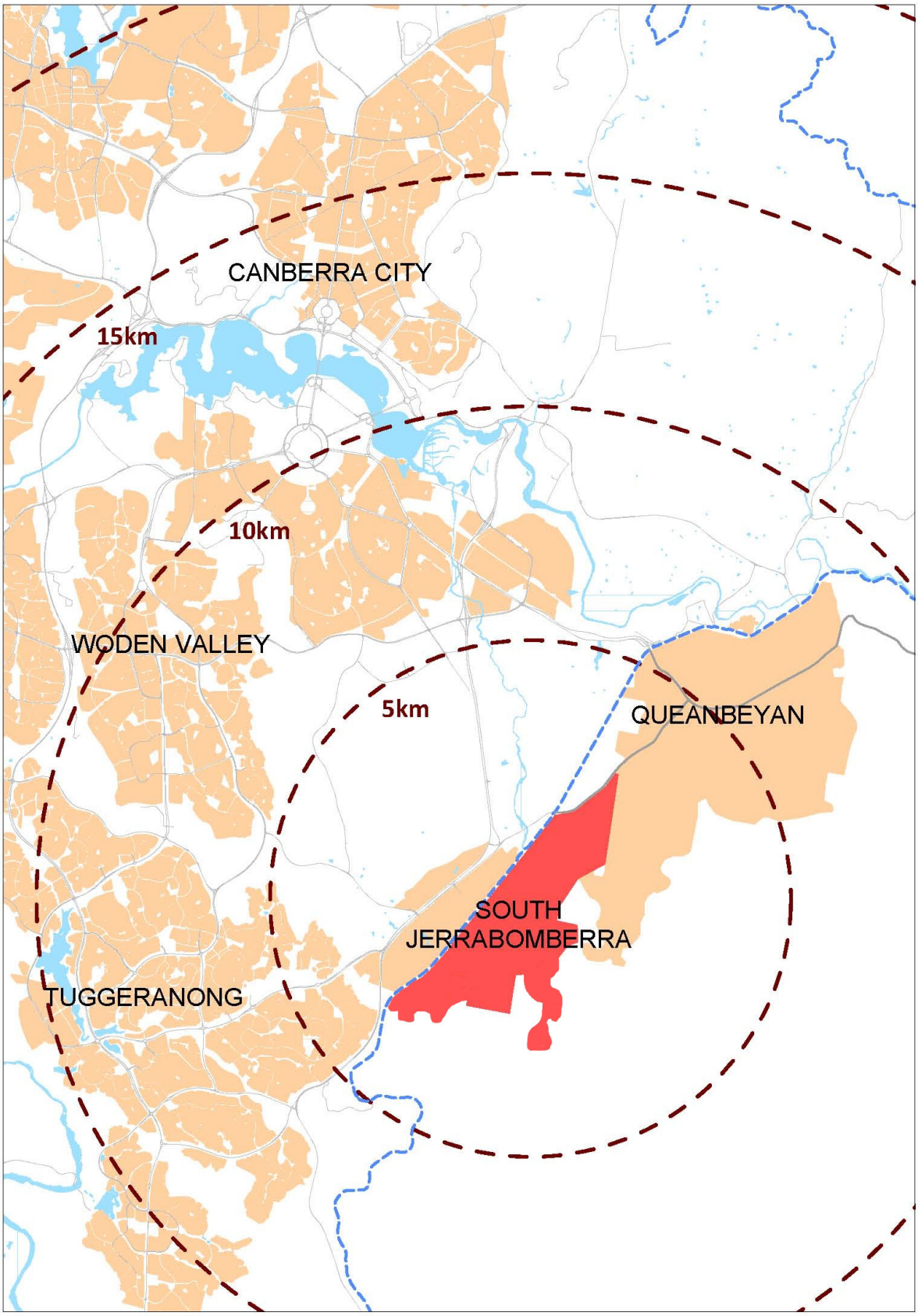
The regional context of the South Jerrabomberra Release Area is shown in Figure 1.

1.2 Purpose of this Assessment

The preliminary environmental assessment has been prepared to support an application by Village Building Company for the development of water cycle infrastructure for the South Jerrabomberra release area. It is seeking application for the following:

- Approval of a project concept plan for the development of water cycle infrastructure for the South Jerrabomberra release area.
- Approval to carry out part of the project, being the development of the water cycle infrastructure for the South Tralee precinct. The development of infrastructure to service the South Tralee precinct will result in servicing of the North Tralee and Poplars precincts.

Figure 1: Regional Locality Map (South Jerrabomberra Release Area)



1.3 Consultation

Consultation has been undertaken during the preparation of the background reports over the many years that the South Jerrabomberra urban release area has been under consideration.

In particular consultation has been undertaken with the following agencies:

New South Wales bodies:

- Department of Environment, Climate Change and Water (DECCW)
- Department of Planning
- Queanbeyan City Council
- Country Energy
- Jemena Pty Ltd

ACT Government agencies:

- Chief Minister's Department
- Territory and Municipal Services
- ACTEW and ActewAGL
- Department of Environment, Climate Change, Energy and Water (DECCEW)

During the preparation of the Environmental Assessment, more detailed consultation will occur with the relevant government agencies in relation to the specific details of the various components of the Concept Plan and Project Plan applications. The consultations will be conducted by the various technical consultants engaged to undertake the investigations.

Consultation will be undertaken with relevant government agencies prior to the commencement of studies to enable the identification of the key issues that need to be addressed. Following the completion of the studies, government agencies will be further briefed in relation to the findings and proposed mitigation and implementation.

Public consultation will be undertaken in accordance with the requirements of the EP&A Act prior to and following the preparation of the Environmental Assessment, and comments received during this period will be considered and addressed.

1.4 The Proponent

The Village Building Company (VBC), is an award-winning national property developer based in Canberra. It develops housing estates in the Australian Capital Territory, New South Wales and Queensland. VBC is the proponent for the majority of the residential component, a portion of the employment land in the South Jerrabomberra urban release, and the development of the initial servicing (water cycle infrastructure) infrastructure.

VBC creates residential and mixed-use environmentally sensitive living estates, with a focus on maximising the sense of community for people living within them. This is achieved by encouraging residents to participate in community events and the incorporation of open spaces, parklands, boardwalks, ponds and bike paths within estates.

VBC has a primary focus of the provision of affordable housing options, including the currently under construction developments at Macgregor West (1,300-lot subdivision), North Watson (316-lot subdivision) and numerous apartment buildings at Bruce in the ACT.

2. SITE ANALYSIS AND CONTEXT

2.1 Urban Release Area Location

The South Jerrabomberra urban release area is located approximately 5 km south west of the Queanbeyan CBD and occurs within the Queanbeyan City Council Local Government Area (LGA).

The release is located within NSW and is immediately adjacent to the Australian Capital Territory (ACT) border, the Hume Employment Area and the existing Jerrabomberra residential area. The urban release covers an area of approximately 1160 hectares.

The location of the release area is shown in Figure 2.

2.2 Existing Development

The South Jerrabomberra urban release area predominately comprises rural land that is mostly undeveloped. Improvements within the release area include a number of farm houses and sheds, a disused motor speedway, a network of tracks, and storage dams.

The area surrounding the South Jerrabomberra release has seen a gradual change in land use from rural to urban and industrial development.

Major land uses immediately adjoining the release area include the ACT Hume Employment Area to the west and residential neighbourhoods in Jerrabomberra to the east. The release area is bounded by Territory Parade to the west which runs adjacent to the Goulburn-Bombala railway line and the ACT-NSW border.

2.3 Heritage Issues

A number of heritage investigations have been undertaken during the preparation of the Local Environment Studies for individual properties in the South Jerrabomberra release on behalf of the Queanbeyan City Council. These studies have identified a number of sites that may contain items of European and Aboriginal heritage significance.

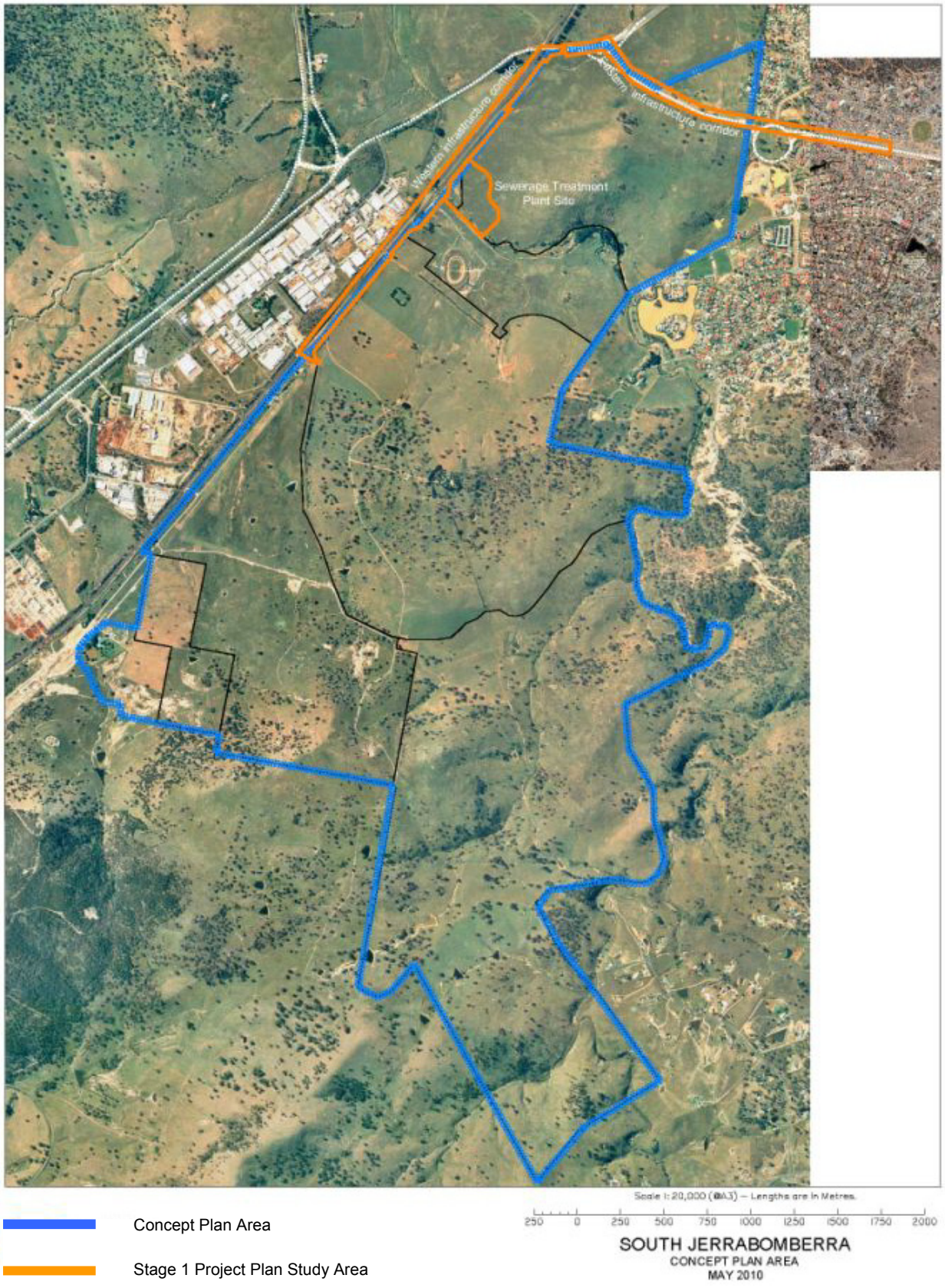
2.3.1 European Heritage

Since European settlement of the area, the primary land use has been farming, in particular sheep and pig farming. In more recent times, alternative compatible uses were undertaken, such as the Fraser Park Raceway. As a result of these activities, the landscape is mostly cleared of vegetation and sparsely populated.

The following items have been identified as potentially having some heritage significance:

- Homesteads and shedding associated with former farming properties;
- Shearing Sheds;
- Stone monuments constructed as part of the previous Halloran subdivision plan for the Environa property;
- Various huts and stone buildings located around the release area; and
- The race tracks and building associated with the former Fraser Park Raceway facility

Figure 2: Study Area Locality Map



The heritage studies conducted as part of the completed Local Environment Studies have recommended that further investigation of these matters be undertaken as part of individual development consents on the separate properties.

2.3.2 Aboriginal Heritage

In the Navin Officer Heritage Consultant's (2003) report for the Tralee Local Environment Study (2005) it was noted that the south Canberra/Queanbeyan area was close to the tribal boundaries of the Ngunnawal and Walgalu people. There is some uncertainty as to which language was spoken by the Aborigines of Canberra/Queanbeyan, however the area appears to have been close to the linguistic boundary between the Gundungurra and Ngunnawal languages.

References to the traditional Aboriginal inhabitants of the Canberra/Queanbeyan region are rare and often difficult to interpret (Flood 1980, Huys 1993). The consistent impression however is one of rapid de-population and a desperate disintegration of a traditional way of life over little more than fifty years from initial white contact (Officer 1989). Early accounts of Aboriginal lifestyles in areas comparable with the study locality describe aspects of a successful hunting and gathering economy, an eventful social life, and inter-group contacts. The material culture, which is partly reflected in the surviving archaeological record, included stone and wooden artefacts, skin clothing and bark and bough temporary dwellings (Flood 1980, Huys 1993).

The investigations carried out as part of the local environmental studies has identified several isolated areas of aboriginal artefact scatters and one scared tree. These areas have been classified as having low significance, however consent from the NSW National Parks & Wildlife Service would be required to disturb these areas.

The banks of Jerrabomberra Creek have been identified as an area containing potential archaeological deposits. The heritage studies recommend that further investigations of this area be undertaken as part of individual development consents for the affected properties.

2.4 Natural Environment

The existing flora and fauna within the South Jerrabomberra urban release area has been subject of many investigations undertaken as part of previous Local Environment Studies, or as input into local environment studies currently being undertaken by the Queanbeyan City Council for the rezoning of land for urban development. The primary aim of these studies has been to identify ecological constraints and options for development.

2.4.1 Flora

Natural habitats within these areas have been subject to a range of disturbances, which have included vegetation clearing, agricultural activity and development. Parts of the development contain important habitat features and remnant native vegetation; however the majority of the development area has been cleared of native vegetation and has been sown with pasture plants and used extensively for cultivation and stock grazing. The western half of the North Tralee property was formerly developed for the now-disused Fraser Park Raceway and associated infrastructure.

Isolated sections of the development area contain remnant stands of native vegetation, which have affinity with two endangered ecological communities: Natural Temperate Grassland and White Box-Yellow Box-Blakely's Red Gum Woodland. For the most part these areas are in moderate to good condition. Additionally, within the release area (generally in the Tralee Hills), there are a rocky outcrops which support a *Rocky Outcrop Shrubland/Herbland* mosaic. Broader areas of grasslands also

supported scattered mature trees, some eucalypt regeneration and old stumps. This indicates that substantial areas of the grasslands present are the result of tree clearing (i.e. are secondary grasslands).

2.4.2 Fauna

The studies have investigated the presence and distribution of following threatened species, listed under the Threatened Species Conservation Act 1995 (NSW) and the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).

Species	Listing Status
Golden Sun Moth (*Synemon plana*)	TSC (E), EPBC (CE)
Pink-tailed Worm Lizard (*Aprasia parapulchella*)	TSC (V), EPBC (V)
Striped Legless Lizard (*Delma impar*)	TSC (V), EPBC (V)
Grassland Earless Dragon (*Tympanocryptis pinguicolla*)	TSC (E), EPBC (E)
Rosenberg's Monitor (*Varanus rosenbergi*)	TSC (V)
Brown Treecreeper (*Climacteris picumnus*)	TSC (V)
Diamond Firetail (*Stagonopleura guttatai*)	TSC (V)
Gang-gang Cockatoo (*Callocephalon fimbriatum*)	TSC (V)
Hooded Robin (*Melanodryas cucullata*)	TSC (V)
Speckled Warbler (*Chthonicola sagittata*)	TSC (V)
Threatened Bats	TSC (V)

The results of the various flora and fauna studies have been previously discussed with DECCW, both prior to and following the survey work

2.5 Hydrology

A desktop review of existing groundwater reports and studies has been conducted, which included two groundwater reports and one stormwater management study for the South Jerrabomberra release. These are the *Study on the Current State of Jerrabomberra Creek* (Maunsell 2005); *Preliminary Hydrogeological Characterisation of the Proposed South Jerrabomberra Site* (Salient Solutions 2005) and *South Jerrabomberra Integrated Water Servicing: Stormwater Management* (EDAW|AECOM, 2009). The findings of these reports are summarised below.

2.5.1 Drainage

The proposed development site occupies land within the catchment of the Jerrabomberra Creek immediately upstream of the NSW/ACT border. There is significant pre-existing development within the Jerrabomberra Creek catchment. Land on the north eastern side of the creek has been developed for residential dwellings (circa 1980) and land in the upper catchments has been subject to ongoing low density rural-residential development.

The Jerrabomberra Creek is a tributary to the Molonglo River which in turn discharges to Lake Burley Griffin. The existing Queanbeyan waste water treatment plant presently discharges treated effluent into the Molonglo River upstream of the lake. In recent years, concerns have been raised due to the reduced water quality of the Lake Burley Griffin. In particular, algal blooms (including Blue Green Algae) have occurred in the lake during periods of elevated temperatures and low flows. These algal blooms present a public health nuisance and significantly reduce the amenity value of the lake. The

majority of the land to be developed is on the west side of the existing watercourse with only the Poplars development located on the north east side of the creek.

Prior to the development of the catchment for pasture, the riparian corridor that passes through the site is thought to have consisted of a formed channel through the undulating hill country in the upper reaches of the catchment with a swampy meadow and a chain of ponds waterway present on the low lying land. In post European times, the Jerrabomberra Creek has formed a deeply incised channel along the entire reach. Stream flow is largely ephemeral.

2.5.2 Surface Water

Flow characteristics from a gauge at the junction of Jerrabomberra Creek and Four Mile Creek (DIPNR gauging site 410743) were analysed by Salient and ICAM in 2001. The analysis showed that total flow represented about 86 mm of water on the catchment, and base flow (i.e. that generated by groundwater discharge) accounted for approximately 20% of the flow. This level of the baseflow is low, and probably results from a more widespread indurated layer causing recharge to the deeper aquifer to exit the system via downslope flow to the Creek. It is also possible that the low hydraulic conductivity and specific yield of the fractured rock aquifer contributes to lower groundwater throughflow (Salient Solutions 2005). The analysis of the gauging stations further down the Creek in the ACT showed that this partition between quick and base flow changed, with base flow becoming a larger proportion. This change in Creek character was probably where the Creek exited the hills onto the broader and flatter Canberra Plain (Maunsell 2005).

2.5.3 Ground Water

The Jerrabomberra Creek Catchment is underlain by aquifers that transmit groundwater. These aquifers are developed in the rocks of the catchment as well as in the shallower transported regolith (layer of loose rock resting on bedrock) materials (Maunsell 2005). Salient Solutions (2005) suggest that the fractured rock aquifers allow substantial water movement of up to 100m depth. Generally, drilled bores will encounter groundwater in the top 20 to 60 metres, but this may extend to a depth of 100 metres. Small amounts of water at greater than 100 metres depth are rare and generally associated with major faults.

Open fracturing occurs fairly uniformly over the landscape, and tends to mimic the topographic shape and effects on groundwater flow. For example, it may be slightly deeper under the hills than under valley floors and each major valley will tend to behave as its own groundwater flow system known as 'local groundwater flow systems' (Salient Solutions 2005).

At the local scale however, the heterogeneous nature of the fracturing distribution will produce areas where groundwater flows across the slope and any unfractured rock mass will be devoid of groundwater.

2.5.4 Jerrabomberra Creek

Maunsell (2005) indicated that monitoring results along Jerrabomberra Creek show that both the water and the riparian quality of much of the Creek is degraded and impoverished. Suggested causes included overgrazing, leading to sediment, nutrient and microbiological run-off; various pollutants in stormwater from the Hume employment area, road surfaces, residential areas, the Mugga Lane landfill, and the impact of rural residential developments (septic tanks, land clearing etc). There is concern that pollutants from the landfill leachate ponds may enter ground and surface waters of the catchment. Many landholders allow their animals to enter Jerrabomberra Creek to be watered year-round. The water quality impacts of these activities are borne downstream.

More than 80% of the sediment yield from the Catchment is from the banks of the Creek, associated gullies, and the creek-bed itself, as opposed to coming from sheet and rill erosion. Materials that naturally bind to the sediments, for example phosphorous, remain with the sediment in the channel beds, banks, and associated gullies. During sediment transport in the Creek, phosphorous can be re-released into suspension or solution in the water column with the potential to feed algal blooms (Maunsell 2005).

2.6 Geology

Preliminary geological investigations have indicated that the area is formed from Upper Silurian volcanics of dacitic, rhyo-dacitic, and rhyolitic ash flow tuffs and welded ignimbrites. At a local scale, the geology is complex and comprises the Deakin and Colinton volcanics, the Laidlaw Volcanic Suite, the Cappanana Formation, and the Jerrabomberra Fault (Salient Solutions 2005).

The landscape character ranges from fresh, fractured volcanic areas to areas of deeper weathering with some fractures sealed by clay linings. Fracturing across the rock mass has a heterogeneous distribution: on higher slopes, it is more densely fractured and covers large areas; the mid slopes have less fracturing or fractures have closed due to weathering; on lower slopes there is a lack of visible outcrops and it is likely that a similar heterogeneous fracturing pattern is also present (Salient Solutions 2005).

The more deeply weathered in situ profiles may extend 10 to 15 metres in depth, with transported materials being up to five metres thick. In some places, a hard indurated layer exists which has a substantial impact on water flow at shallow depths (Salient Solutions 2005).

The soil landscapes of the South Jerrabomberra study area are classified as Burra and Campbell. The Burra soil landscape covers approximately 85% of the development area, with the remaining 15% of soils classified as Campbell soil landscape. The boundary between the Burra and Campbell soil landscapes is often gradual, however the Burra soil landscapes tend to occur on fans and more gently inclined hill slopes (Jenkins 2000).

2.7 Air Quality

The South Jerrabomberra urban release area is located adjacent to the Hume employment area, which is located within the ACT. The potential impacts of industrial uses on the development of the Poplars, North and South Tralee properties have been considered as part of the Local Environmental Studies conducted by the Queanbeyan City Council.

The most recent Local Environment Study, prepared by EcoLogical Australia (2009) indicates that the two potential main sources of odour, a recycling plant and a boiler stack at a timber mill are no longer present as these operations have ceased. Detailed studies (including dispersion modelling) undertaken by PAE Holmes (2005, 2009) and Heggies Australia (2004, 2006) indicate only short term dust impacts may be experienced in a small portion of the South Tralee site. The general conclusion was that the short term PM10 levels were likely to be acceptable.

Some limited field measurements of odour indicated that odour impacts were unlikely, although this would be very much dependent on meteorological conditions. PAE Holmes concluded that odour impacts from the estate were likely to be acceptable at the South Tralee site and that modelling was not warranted.