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Attention: Clearing Permit Section  
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Delivered by email to: [info@dwer.wa.gov.au](mailto:info@dwer.wa.gov.au)

Dear Sir/Madam

## **CLEARING PERMIT (AREA PERMIT) APPLICATION FOR PART LOT 9008 FARRALL ROAD, MIDVALE- BULK EARTHWORKS**

Emerge Associates (Emerge) has been engaged by Peet Stratton Pty Ltd (the 'applicant') to provide environmental consultancy services to support the future subdivision works within part Lot 9008 on Deposited Plan 414081 located on Farrall Road, Midvale.

This lot contains native vegetation that is proposed to be cleared to facilitate future residential development in accordance with the approved *Farrell Road Local Structure Plan (LSP) No. 42*. The proposed earthworks will necessitate the removal of all vegetation within the application area, with no vegetation within the application area proposed to be retained. The purpose of the clearing is to conduct bulk earthworks in accordance with the *Movida Estate – Stage 11 Bulk Earthworks Plan* (Civil Group, 2019) to allow for the proposed residential subdivision works over the application area.

The following letter is provided in support of a clearing permit application (area permit) pursuant to Part V of the *Environmental Protection Act 1986* (EP Act) and includes the following attachments required by the Department of Water and Environmental Regulation (DWER).

- **Attachment 1** - Signed area clearing permit (C1) application form.
- **Attachment 2** – Power of Attorney for Peet Stratton Pty Ltd
- **Attachment 3** - Certificate of Title for Lot 9008 on Deposited Plan 414081
- **Attachment 4** - Movida Estate – Stage 11 Bulk Earthworks Plan (Civil Group, 2019)
- **Attachment 5** - Plant species list
- **Attachment 6** - Wetland evaluation
- **Attachment 7** - Extracts from LSP approval process
- **Attachment 8** – Local Structure Plan Landscape Masterplan
- **Email Attachments** to the submitted application: spatial data (shapefile) of the application area and zip file containing the IBSA data files.

## Application area

The application area is located within part 9008 Farrall Road in Midvale and is bound by vacant undeveloped land and Toodyay Road to the north, the former Farrell Road Reserve to the east, Midland Toodyay Railway reserve to the west and south. The extent of the site and the LSP area are shown in **Figure 1**.

The application area is 3.6 hectares (ha) in size and comprises 1.85 ha of vegetation in 'degraded condition' and 1.75 ha in 'completely degraded' condition.

## Background

### Planning context

The application area is located within the City of Swan (CoS) municipality and is zoned 'urban' under the *Metropolitan Region Scheme* (MRS) and 'residential development' under the CoS *Local Planning Scheme* (LPS) no. 17. The application area was included as part of the Farrall Road *Local Structure Plan* No. 42 which was approved by the Western Australian Planning Commission (WAPC) in September 2016.

A subdivision application is being progressed for approval by WAPC over the Stage 11 of the Movida Estate which encompasses the application area. In addition, a Development Application was lodged with the City of Swan in November 2019 (DA-702/2019) to facilitate the proposed earthworks outlined. Clearing and earthworks is anticipated to begin in April 2020 once the relevant approvals have been obtained.

### Environmental Features

The majority of the application area is mapped as comprising a 'resource enhancement wetland' (REW) in the *Department of Biodiversity Conservation and Attractions' (DBCAs) Geomorphic Wetlands of the Swan Coastal Plain* dataset (DBCA 2019). This wetland was classed as a palusplain type wetland and is 2.83 ha in size, of which 2.5 ha occurs within the application area. A small area within the southern, western and northern portion of the application area (totalling to 0.10 ha) is also mapped as a 'multiple use wetland' (MUW) (DBCA 2019). This wetland feature was also classified as a palusplain and is 353.03 ha in size. The location of wetlands within the application area and the surrounding area is shown in **Figure 2**.

No *Bushforever* sites are mapped within the application area. Three *Bushforever* (BF) sites are located near the application area to the north-west, south and east, BF 302 associated with Jane Brook, BF 306 associated with Talbot Road and BF 309 associated with the Movida Estate within Lot 102 (land owned by the applicant).

No environmentally sensitive areas (ESAs) are mapped over the application area. One ESA is located to the east of the application area and is associated with BF 306 and one ESA located south of the application area associated with BF 309.

No Biodiversity linkages are mapped over the application area. One biodiversity linkage is located to the north of the site and extends west and north of the site.

The location of *Bushforever* sites, ESAs and biodiversity linkages is shown in **Figure 3**.

### Historical clearing

A review of historical images available from 1953 onwards shows that the majority of the application area was uncleared prior to 1953 (Landgate 2019). By 1961 minor instances of clearing are visible in the western portion of the application area and extending down into the south-western portion of the application area associated with the construction of the Midland Toodyay Railway. Circa 1995 additional clearing occurred with the excavation of a man-made sump to the north of the application area and associated vehicle access track. Since this time, vegetation has re-established across the previously cleared portions of the application area.

## Flora and vegetation values

A spring flora and vegetation survey over the full extent of the LSP area, including the application area was undertaken by Emerge Associates in 2014 (Emerge Associates 2015). The survey did not identify ‘threatened’ or ‘priority’ flora species within the application permit area. Individuals of ‘priority 3’ flora species *Isopogon drummondii* were identified to occur to the south-east of the application area within Lot 102.

A subsequent reconnaissance flora and vegetation assessment encompassing the application area was undertaken by an ecologist from Emerge on the 1<sup>st</sup> of November 2019 to reconfirm the vegetation values and map plant communities at a finer scale for the clearing permit application. The following provides a summary of the flora and vegetation values pertaining to the application area as determined in Emerge Associates (2015) and reconfirmed during the reconnaissance survey (2019).

### General site conditions

Native vegetation is present within the centre, southern and western portion of the application area. The native vegetation comprises stands of *Corymbia calophylla* (marri) and *Melaleuca preissiana* (moonah) trees with predominantly non-native understorey that includes scatter native shrubs and is associated with seasonal wetland (palusplain). Multiple informal tracks run through the application area.

### Species inventory

A total of 19 native and 37 non-native (weed) species were recorded within the application area during field surveys, representing 22 families and 49 genera. The dominant family containing native taxa was Myrtaceae (nine native taxa and one weed taxa). The family containing the most taxa was Poaceae (one native and 10 non-native species).

A complete species list is provided in **Attachment 5**.

### Threatened and priority species

No threatened or priority flora species were recorded within the application area.

### Declared pests

One species, *\*Zantedeschia aethiopica* (arum lily) listed as a declared pest (C3) exempt keeping category pursuant to the *Biosecurity and Agriculture Management Act 2007*, was recorded within the application area. A number of individuals were recorded scattered throughout the application area.

### Plant communities

Four plant communities were identified within the application area. Plant community **Cc** occurs in small patch in the southern portion of the application area. This community extends over 0.07 ha. Plant community **Mp** exists within the centre portion of the application area and extends over 1.61 ha. Plant community **R** occurs along the north-western portion of the application area and extends over 0.17 ha. The remainder of the application area (1.75 ha) contains non-native vegetation with bare soil, weeds or planted vegetation.

A description and the area of each plant community is provided in **Table 1** and representative photographs of each are provided in **Plate 1** to **Plate 4**. The location of each plant community is shown in **Figure 4**.

**Table 1: Description and extent of plant communities identified within the application area**

| Plant community  | Description  | Area (ha) |
|------------------|--|-----------|
| Cc               | Woodland of <i>Corymbia calophylla</i> over shrubland <i>Jacksonia</i> spp., <i>Adenanthos cygnorum</i> and <i>*Leptospermum laevigatum</i> (or shrub layer absent) over closed forb/grassland of pasture weeds.   | 0.07      |
| Mp               | Woodland to low open forest of <i>Melaleuca preissiana</i> , with emergent <i>Corymbia calophylla</i> over sparse shrubland of <i>Astartea scoparia</i> , <i>Marianthus</i> sp., <i>Xanthorrhoea preissii</i> and <i>Acacia pulchella</i> over sedgeland to closed sedgeland of <i>Dielsia stenostachya</i> and <i>Cyperaceae</i> sp. and open forbland of <i>Corynotheca micrantha</i> subsp. <i>micrantha</i> , <i>Drosera</i> spp. and <i>Burchardia congesta</i> . Understorey layers largely absent in degraded areas and replaced by a closed grass/forbland of pasture weeds. | 1.61      |
| R                | Revegetated area adjacent to man-made sump containing predominantly planted native and exotic species.   | 0.17      |
| Parkland cleared | Sparse native and planted exotic trees over closed forb/grassland of pasture weeds.  | 1.75      |

*Plate 1: Plant community Mp in degraded condition.*





*Plate 2: Plant community Cc in degraded condition.*



*Plate 3: Plant community R in degraded condition.*



Plate 4: Parkland cleared in completely degraded condition.

#### Vegetation condition

Vegetation condition within the application area ranges from ‘completely degraded’ to ‘degraded’. The degraded areas consist of patches of native trees and shrubs with predominantly non-native understorey. The ‘completely degraded’ areas comprise predominately non-native species. The extent of vegetation by condition category is detailed in **Table 2** and shown in **Figure 5**.

**Table 2: Extent of vegetation condition categories within the application area**

| Condition category (Keighery 1994) | Size (ha) |
|------------------------------------|-----------|
| Pristine                           | 0         |
| Excellent                          | 0         |
| Very good                          | 0         |
| Good                               | 0         |
| Degraded                           | 1.85      |
| Completely degraded                | 1.75      |

#### Floristic community type

Due to the disturbed and modified condition of the vegetation it would be difficult to accurately identify a ‘floristic community type’ (FCT) for the plant communities within the application area using a statistical approach. However, it is inferred that plant communities **Mp** and **Cc** are likely to have originally represented FCT 11 ‘wet woodlands and shrublands’, which is not listed as a threatened or priority ecological community (TEC or PEC).

#### Fauna habitat

Fauna habitat values within the application area are generally low. The majority of native vegetation within the application area was historically cleared and has regrown and habitat value is largely limited to areas of native overstorey, non-native grassland and scattered native and non-native trees.



A fauna assessment for the broader subdivision area was previously prepared by Harewood (2014). The application area contains vegetation that may provide potential habitat for threatened species of black cockatoo, namely *Calyptorhynchus baudinii* (Baudin's cockatoo), *Calyptorhynchus latirostris* (Carnaby's cockatoo) and *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo). No black cockatoo habitat trees are located within the application area (Harewood 2014). A limited number of large trees within the application area, including marri and non-native eucalypt trees, have the potential to provide roosting habitat for black cockatoos. However, no black cockatoo roosting activity was previously recorded within the application area (Harewood 2014). Additionally, scattered marri and *Pinus* sp. (pine) trees within the application area provide a small area of potential black cockatoo foraging habitat.

## Response to EP Act Clearing Principles

When assessing clearing permit applications, DWER has regard to the ten clearing principles contained in Schedule 5 of the EP Act so far as they are relevant to the matter under consideration. In support of this permit clearing application, we have considered and responded to the ten clearing principles in the following sections. These responses have been prepared with reference to the applicable guidelines published by the DWER (2019) and DER (2014).

### Principle (a) - Native vegetation should not be cleared if it comprises a high level of biological diversity.

The application area contains vegetation that is in 'degraded' or 'completely degraded' condition and is dominated by weed species. A total of 16 native and 24 non-native species were previously recorded within the application area. Thus, the native vegetation within the application area does not comprise a high level of biological diversity and clearing is not considered to be at variance to this principle.

### Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

A fauna assessment and black cockatoo habitat assessment was undertaken for the broader subdivision area (Harewood 2014). Based on this fauna assessment, five native fauna species that were either 'endangered', 'vulnerable' or in need of special protection under State and/or Commonwealth legislation were identified as having potential to occur within the application area. The fauna species and the potential impacts of the proposed clearing upon each species are provided in Table 3.

**Table 3: Listed conservation significant fauna species potentially occurring in the subdivision area and likelihood and possible impacts of the proposed clearing (Harewood 2014).**

| Species   | EPBC Act status | BC Act status | Likelihood and possible impacts (Harewood 2014)                                    |
|---|-----------------|---------------|--|
| <i>Calyptorhynchus baudinii</i><br>(Baudin's cockatoo)                    | EN              | EN            | Possible – loss/modification of a small area of low quality foraging habitat       |
| <i>Calyptorhynchus latirostris</i><br>(Carnaby's cockatoo)                | EN              | EN            | Known to occur – loss/modification of a small area of low quality foraging habitat |
| <i>Calyptorhynchus banksia naso</i><br>(forest red-tailed black cockatoo) | VU              | Vu            | Known to occur – loss/modification of a small area of low quality foraging habitat |
| <i>Falco peregrinus</i><br>(peregrine falcon)                             | -               | S             | Possible – loss/modification of a small area of foraging habitat                   |
| <i>Isodon fusciventer</i><br>(quenda)                                     | -               | P5            | Possible – loss/modification of a small area of habitat                            |

The application area falls within the known range of three Commonwealth and State listed black cockatoo species, namely *Calyptorhynchus baudinii* (Baudin's cockatoo), *Calyptorhynchus latirostris* (Carnaby's cockatoo) *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo).

A level 2 targeted black cockatoo habitat survey was undertaken as part of a wider level 1 fauna assessment (Harewood 2014). A small flock of Carnaby's black cockatoo were observed flying overhead during the field survey and foraging evidence identified on marri and coastal blackbutt fruit was attributed to this species. During the flora and vegetation survey (Emerge Associates 2015), forest red-tailed black cockatoos were observed sitting in coastal blackbutt trees adjacent to Farrall Road (outside of the application area). No evidence of Baudin's black cockatoo was recorded (Harewood 2014).

The assessment of trees indicated that no potential habitat trees are present within the application area (tree of a suitable species over 50 cm diameter at breast height (DBH)).

Plant communities **Mp** and **Cc** may be foraged in by black cockatoos due to the presence of marri. However, the extent of marri within the application area is small and fragmented. Harewood (2014) estimated the extent of foraging habitat within the entire LSP area to approximately 1.7 ha. Given the sparse, scattered nature of the foraging species present, the overall quality of the foraging habitat within the application area is considered to be limited (Harewood 2014).

*Falco peregrinus* (peregrine falcon) was considered to potentially utilise some sections of the LSP area as part of a much larger home range and would only occur rarely, and no existing nest sites were observed during the fauna assessment. As such, the proposed clearing is unlikely to have a significant impact upon the potential habitat of this species within the wider area.

*Isodon fusciventer* (quenda) was considered to potentially occur within areas containing dense understory, including areas with thick non-native grasses. Understory within the application area comprises primarily non-native grassland. It is considered possible that quenda may occur within the application area. However, habitat within the application area would not be considered significant and as such the proposed clearing is unlikely to have a significant impact upon habitat of this species within the wider area.

The fauna assessment (Harewood 2014) determined that there is the possibility of a small loss of habitat for a number of conservation significant fauna species. However, the quality and extent of any habitat within the application area is limited and it is expected that all potentially affected species are likely to utilise higher quality vegetation surrounding the application area within reserved areas, Bush Forever sites that are likely to remain reserved in perpetuity. Thus, clearing is not likely to be at variance with this principle.

Principle (c) – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

No threatened or priority flora species were identified within the application area during the detailed flora and vegetation survey (Emerge Associates 2015) or during the subsequent reconnaissance survey conducted by Emerge in 2019. It was noted that 14 individuals of the priority 3 flora species *Isopogon drummondii* were recorded within plant community **BaBm** to the south of the application area (Emerge Associates 2017). As the application area does not contain any threatened or priority flora or significant habitat, the proposed clearing is not variance with this principle.

Principle (d) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.

Known locations of threatened ecological communities (TECs) and priority ecological communities (PECs) within 10 km of the application area were searched for as part of the flora and vegetation survey, using the publicly available *Weed and native flora* dataset (Keighery et al. 2012), the *Protected Matters Search Tool* (DoEE 2019) and DBCA's threatened and priority ecological communities' database. These search results indicated that no TECs or PECs are known to occur within the application area, but that the following four TECs are considered to occur in the wider area:

- *Corymbia calophylla* - *Kingia australis* woodlands on heavy soils, Swan Coastal Plain (SCP 3a)
- *Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (SCP 3c)



- Shrublands and woodlands of the eastern side of the Swan Coastal Plain (SCP 20c).

SCP 20c occurs in Talbot Road Bush forever site 306 and also within Lot 102 (land owned by the applicant).

None of the communities above, or any other TECs or PECs, were previously identified as occurring within the application area (Emerge Associates 2015) which was reconfirmed during the recent site visit. As no TECs or PECs are present within or adjacent to the application area, the proposed clearing is not at variance with this principle.

Principle (e) – native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Regional vegetation complex mapping for the Swan Coastal Plain undertaken by Heddle *et al.* (1980) delineates the various vegetation complex types which would have occurred across the region prior to European settlement in Western Australia. Based on this mapping, the application area comprises the Guildford complex. Vegetation in this complex mainly consists of “a mixture of open forest to tall open forest of *Corymbia calophylla* - *Eucalyptus wandoo* - *Eucalyptus marginata* and woodland of *Eucalyptus wandoo* (with rare occurrences of *Eucalyptus lane-poolei*). Minor components include *Eucalyptus rudis* – *Melaleuca raphiophylla*” (Heddle *et al.* 1980).

Prior to European settlement and the extensive land clearing that followed, the Guildford complex covered 92,281 ha of the Swan Coastal Plain. Today 4,936 ha or 5.3% of this complex remains. Less than 1% of this complex original extent is currently under some form of formal or informal protection (EPA 2015).

The Environmental Protection Authority (EPA)(EPA) has previously identified (2006) a native vegetation retention target of at least 10% of the pre-clearing extent for ecological communities within ‘constrained areas’, such as areas in the Swan Coastal Plain portion of the Perth Metropolitan Region. However, the EPA’s current factor guideline for flora and vegetation does not specify a retention target. Instead it indicates the degree from threatening processes should be considered as part of an impact assessment.

The native vegetation within the application area is likely to have formed part of the Guildford complex, which has been extensively cleared. However, the vegetation in the application area is unlikely to represent significant remnants of Guildford complex vegetation due to the ‘degraded’ and ‘completely degraded’ condition. Therefore, the proposed clearing is not considered to be at variance to this principle.

Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

A review of the *Geomorphic Wetlands, Swan Coastal Plain* dataset identified two wetland features that occur within the boundaries of the application area ‘multiple use wetland’ (MUW) 15136 and ‘resource enhancement wetland’ (REW) 12624, as shown in **Figure 2** (DBCA 2019). This wetland is not considered a ‘significant’ wetland in accordance with *A guide to the assessment of applications to clear native vegetation* (DER 2014).

The flora and vegetation survey included an assessment of the general characteristics of each wetland feature which considered aspects such as hydrology, vegetation and landform (Emerge Associates 2015). The results of this assessment are outlined in **Table 4** below.

Table 4: Wetlands intersecting the application area

| Unique feature identifier (UFI) number | Management Category        | Total area | Area within the application area | Wetland characteristics  |
|--|----------------------------|------------|----------------------------------|--|
| 15136                                  | Multiple Use (MUW)         | 335.03 ha  | 0.10 ha                          | Large palusplain wetland which supports 'R' vegetation in 'degraded' condition, in addition to sparse native and planted exotic trees over pasture weeds. Based on the field assessment, the portion of the application area representative of the mapped wetland has been severely compromised due to historical clearance and extensive weed invasion. While it is noted that the MUW contains pockets of intact vegetation, especially to the north of the application area along Jane Brook waterway, the section of the MUW mapped as occurring within the application area is not considered to be representative of a conservation category wetland and does not contain intact riparian native vegetation. |
| 12624                                  | Resource Enhancement (REW) | 2.83 ha    | 2.50 ha                          | Palusplain wetland in the central portion of the application area, which supports 'Mp' and 'Cc' vegetation in 'degraded condition'. The majority of the wetland area contained vegetation with a relatively intact overstorey layer of <i>Melaleuca preissiana</i> with scattered / emergent <i>Corymbia calophylla</i> trees.   |

MUW wetlands retain few ecological attributes but may still provide hydrological functions, which is consistent with the observed characteristics of the MUW that intersects the application area. The MUW within the application area is a small portion of the larger MUW UFI 15136 which extends over 335 ha outside of the application area.

The REW within the application area contains plant community 'Mp' that has an understorey dominated by grass and pasture weeds and weed species such as *\*Zantedeschia aethiopica*. An assessment was undertaken following the reconnaissance survey in 2019 using the DBCA (2017) methodology that confirmed REW to be an appropriate management category for this wetland. This wetland assessment is attached as **Attachment 6**. However, the boundary of this wetland feature is not accurate and would be better reflected by the **Mp** plant community.

Due to the presence of vegetation associated with wetlands within the application area the proposed clearing is at variance with this principle. However, it is considered that the proposal does not constitute a significant impact as discussed further below.

The development of the site was considered as part of the LSP process including removal of wetland vegetation for urban development. An extract of the *Environmental Assessment and Management Strategy* (EAMS) prepared to support the LSP is attached (**Attachment 7**), which discusses the wetland values within the LSP area and outlines the environmental management framework that will be implemented as part of the planning process. This extract also outlines the consultation process with the City of Swan who outlined their preference to reduce open space obligations over the LSP area and concerns with ongoing maintenance, passive surveillance and security if UFI 12624 was retained.

As part of the LSP approval process, comment was sought on the LSP in 2015 from DoW (now DWER) and DPAW (now DBCA) and neither agency raised any comments regarding the urban development of the REW within part Lot 9008. An extract of comments from these agencies is also included in **Attachment 7**.

The Blackadder Creek POS area identified in the LSP includes riparian/wetland vegetation within MUW UFI 15136 and will be retained as part of a multiple use corridor, providing drainage, recreation and some infill planting and weed control.

The proponent has also implemented the mitigation hierarchy to retain, protect and improve the values within the Blackadder Creek POS (within the same LSP) and a very similar wetland within Lot

102 (land own by the applicant). The wetland within Lot 102 is the same wetland type, consanguineous suite, inferred FCT and plant community as the REW within the clearing permit application area. This wetland also has additional values, being a Bush Forever site and with vegetation in 'excellent' condition and is considered representative of a 'conservation category wetland' (CCW). This area of UFI 15136 and the Blackadder Creek riparian vegetation will be included as POS, retained in the long term and in the case of the wetland within Lot 102 will be managed for ongoing conservation.

Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

The application area is small and relatively flat, therefore water erosion from surface runoff from the area would be unlikely to occur. The proposed clearing of the application area is therefore unlikely to increase the risk of land degradation. Despite this, any risk of land degradation will be mitigated through controls applied during clearing and construction (such as dust suppression, mulching, erosions control and silt traps). Therefore, the proposed clearing is not considered to be at variance with this principle.

Principle (h) – Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

The proposed clearing of vegetation in the application area will not impact upon the environmental values of any nearby conservation areas and thus clearing is not considered to be at variance with this principle.

Principle (i) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Available information (DWER 2017) indicates that the application area has been classified as having no known risk of acid sulphate soils (ASS) occurring within three metres of the natural soil surface.

Groundwater data from the *Perth Groundwater Atlas* (DoW 2014) shows minimum groundwater levels are approximately 9 to 11 m Australian height datum (AHD) across the application area with groundwater flowing in a westerly direction.

The proposed clearing is unlikely to have an effect on ASS or the quality of surface or underground groundwater and thus is considered to be not at variance with this principle.

Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding

The application area is not subject to flood risk. The application area is already heavily disturbed and contains patchy remnant vegetation. Clearing the scattered native species occurring within the application area is unlikely to increase the risk of flooding. Thus, the proposed clearing is considered to be not at variance with this principle.

### **Clearing principles and mitigation hierarchy**

Looking at the *WA Environmental Offsets Policy and Guidelines* and the *Clearing of native vegetation Offset procedure* (DER 2014) offsets are required where a proposal is considered to be at variance to one or more of the biodiversity related clearing principles (principles a – f, h) and a significant residual impact remains following application of the mitigation hierarchy.

The Residual Impact Significance Model within the *WA Environmental Offset Guidelines* (Government of WA 2014) also suggest that 'clearing of native vegetation that is watercourse or wetland dependant' may require an offset. As such, we have provided information on the mitigation hierarchy that has been adopted as part of the LSP planning and development process.

### Application of the Mitigation Hierarchy

While not within the clearing permit application area, the proponent has committed to a number of mitigation actions within the larger Movida estate, which directly affect the wetland (particularly UFI 12624) within the clearing permit application area. An explanation of the mitigation hierarchy and relevance to UFI 12624 is provided below.

#### Avoid.

While the proponent does not propose to avoid any impacts to the wetland within part Lot 8000, the proponent will retain part (1.7 ha) of MUW UFI 15136 within Lot 102 (south of the application area), which is also a Bush Forever site within the Movida estate (**Figure 3**). This wetland is shown as POS within the LSP and will be handed over to the City of Swan for conservation management. A buffer from development is provided along the eastern edge of this wetland. The vegetation within this wetland is in 'excellent' condition and is recorded as the same plant community (Mp) as that within Part Lot 8000. It is considered that this wetland is likely to be representative of a CCW and is a very similar wetland to UFI 12624 albeit in 'excellent' condition.

In addition to being in excellent condition, the wetland within Lot 102 is a palusplain wetland within the Swan River consanguineous suite and as such meets a number of the same geomorphology 'representativeness' categories as the wetlands within the proposed clearing permit application area. Both wetlands (within Lot 102 and UFI 12624) are considered to be representative of FCT11 (Wet forests and woodlands) which can exist on a number of vegetation complexes. This FCT is a relatively well reserved wetland plant community across the Swan Coastal Plain (Gibson *et al.* 1994).

The LSP will also retain portions of native vegetation within MUW UFI 15136 associated with Blackadder Creek, consistent with the Landscape Masterplan (**Attachment 8**). As part of the LSP design process, the alignment of Blackadder Creek was reconfigured to maximise the retention of existing native vegetation within the site. Blackadder Creek is part of the same consanguineous suite and wetland type as UFI 12624. An environmental management plan for the Blackadder Creek POS area has been prepared by the proponent and was approved by DWER, Water Corporation and the City of Swan in 2019.

#### Minimise.

As outlined above, the proponent will minimise impacts to a similar wetland in the LSP area located within Lot 102 to the south of the application area. This wetland is within the same consanguineous suite, same vegetation complex, inferred FCT, wetland type and same plant community but in 'excellent condition'. The proponent will minimise impacts to this wetland through the establishment of a vegetated buffer to reduce edge effects and threats to retained vegetation. The impacts to construction on the 1.7 ha of MUW UFI 15136 within Lot 102 will be minimised through specific management procedures for clearing of native vegetation, vehicle and machinery movement, earthworks, sediment, dust and run-off and use and storage of chemicals. These will be outlined within a Construction Environmental Management Plan (CEMP) prepared as a condition of subdivision or development application approval.

Similarly impacts to riparian/wetland vegetation within MUW UFI 15136 have been minimised in the vicinity of Blackadder Creek as part of the Blackadder Creek POS area. An Environmental Management Plan has been prepared for this POS area as a condition of subdivision which outlines management procedures during construction and maintenance including; flood management, retention of mature trees, fauna management, pest, disease and bushfire management. This Environmental Management Plan was approved by DWER (and Water Corporation and City of Swan) as a condition of subdivision.

#### Rehabilitate.

The proponent also proposes to undertake some rehabilitation works within the 1.7 ha of UFI 15136 within Lot 102. Given the 'excellent condition' of the vegetation within this area, the rehabilitation is restricted to minor weed control and some infill planting. The proponent will also rehabilitate part of



a buffer along the eastern edge of the wetland, as well as restoring and increasing the area of FCT 20c TEC within the southern POS area. A Rehabilitation and Vegetation Management Plan (RVMP) has been prepared for the southern POS area within Lot 102, which has been reviewed and approved by DBCA. The requirement to implement the RVMP will be included as a condition of subdivision and this requirement is reflected in the LSP.

Further to the rehabilitation, the southern POS area within Lot 102 incorporating the 1.7 ha of REW UFI 15136 will be managed by the City of Swan in the long term for conservation management. The City of Swan has agreed to the management of the POS area for conservation purposes.

The Blackadder Creek POS area will also include some rehabilitation (through infill planting) of wetland/riparian vegetation and weed control within the Blackadder Creek multiple use corridor.

### **Summary and closing**

Native vegetation within the application area covers 1.85 ha and is in degraded condition. The application area also comprises 1.75 ha of non-native vegetation in 'completely degraded' condition.

Native vegetation within the application area comprises wetland vegetation and the proposed clearing is therefore considered at variance with clearing principle (f). However, wetland vegetation within the site is in degraded condition and, as outlined above, the proponent has implemented the mitigation hierarchy to retain, protect and improve the values and resilience of a very similar wetland within Lot 102 and within the Blackadder Creek POS (within the same LSP).

The wetland within Lot 102 is the same wetland type, consanguineous suite, inferred FCT and plant community as the REW UFI 15136 within the clearing permit application area. This wetland also has additional values, being a Bush Forever site and with vegetation in 'excellent' condition and is considered representative of a CCW. This area of UFI REW 15136 and the Blackadder Creek riparian vegetation will be included as POS, retained in the long term and in the case of the wetland within Lot 102 will be managed for ongoing conservation.

The proposed clearing is not at variance with any of the other clearing principles.

Should you have any questions regarding the content of this letter report please do not hesitate to contact the undersigned.

Yours sincerely  
Emerge Associates



**Chrystal King**  
SENIOR ENVIRONMENTAL CONSULTANT

cc: Gemma Davis and Kasia Majewski, Peet Limited

Encl: Figure 1: Application Area Location  
Figure 2: Hydrological Features  
Figure 3: Environmental Features  
Figure 4: Plant Communities  
Figure 5: Vegetation Condition

Attachment 1: Clearing Permit Application C1 Form  
 Attachment 2: Power of Attorney for Peet Stratton Pty Ltd  
 Attachment 3: Certificate of Title for Lot 9008 on Deposited Plan 414081  
 Attachment 4: Movida Estate – Stage 11 Bulk Earthworks Plan  
 Attachment 5: Plant species list  
 Attachment 6: Wetland evaluation  
 Attachment 7: Extracts from LSP approval process  
 Attachment 8: Local Structure Plan Landscape Masterplan (LD Total 2015)

Email Attachments: Spatial data (shapefile) of the application area and zip file containing the IBSA data files.

## References

- Department of Biodiversity, Conservation and Attractions (DBCA) 2017, *A methodology for the evaluation of wetlands on the Swan Coastal Plain*, draft prepared by the Wetlands Section of the Department of Biodiversity, Conservation and Attractions and the Urban Water Branch of the Department of Water and Environmental Regulation, Perth.
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- Department of Water and Environmental Regulation (DWER) 2019, *Procedure - Native vegetation clearing permits*, Joondalup, WA.
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- Gibson, N., Keighery, B., Keighery, G., Burbidge, A. and Lyons, M. 1994, *A Floristic survey of the southern Swan Coastal Plain*, Department of Conservation and Land Management and the Conservation Council of Western Australia, Perth.
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- Keighery, B. 1994, *Bushland Plant Survey: A guide to plant community survey for the community*, Wildflower Society of WA (Inc), Nedlands.

# Figures



*Figure 1: Application Area Location*

*Figure 2: Hydrological Features*

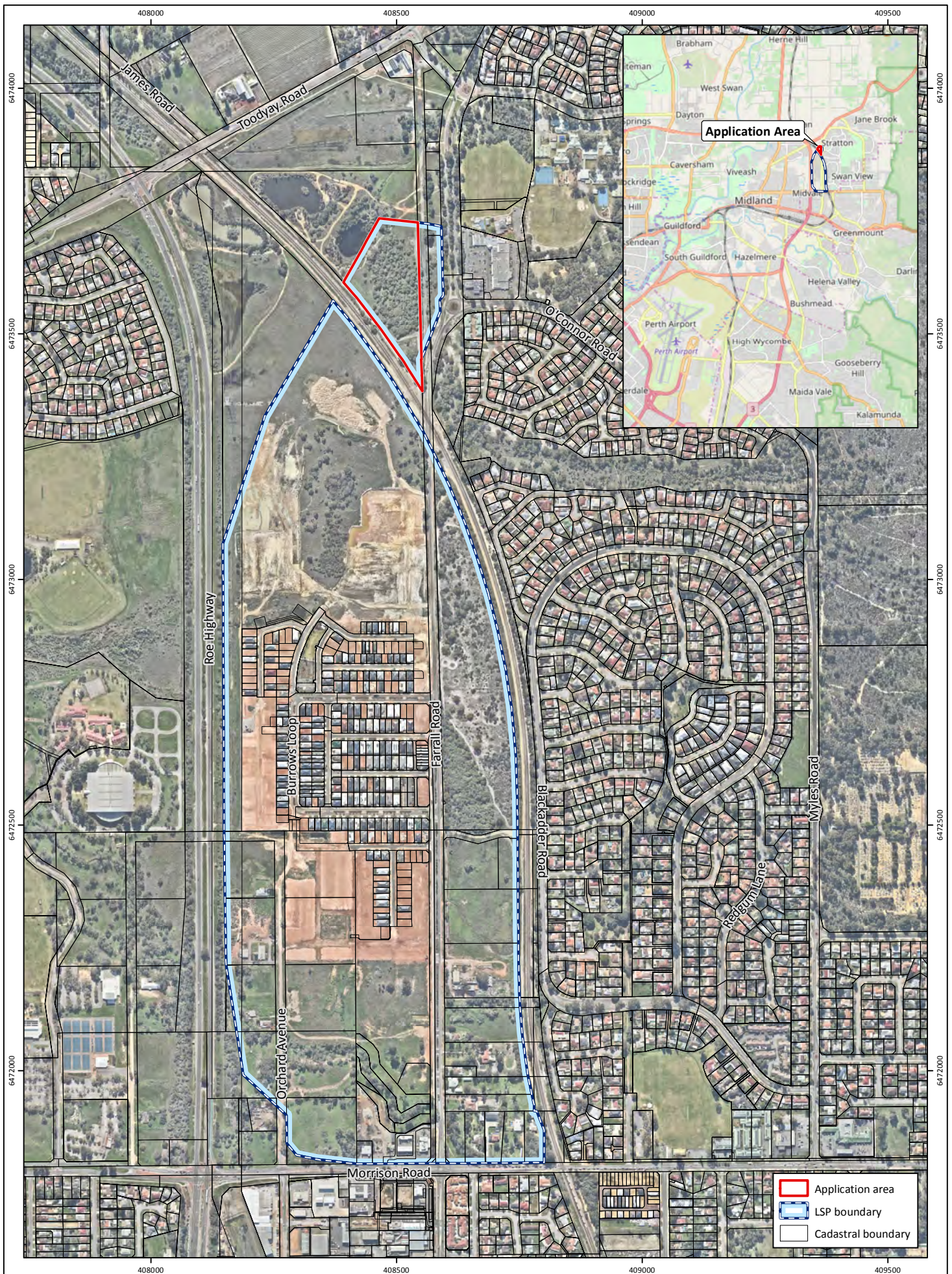
*Figure 3: Environmental Features*

*Figure 4: Plant Communities*

*Figure 5: Vegetation Condition*







**Figure 1: Application Area Location**

**Project:** Northern Wetland Clearing Permit  
Movida Estate  
**Client:** Peet Stratton Pty Ltd

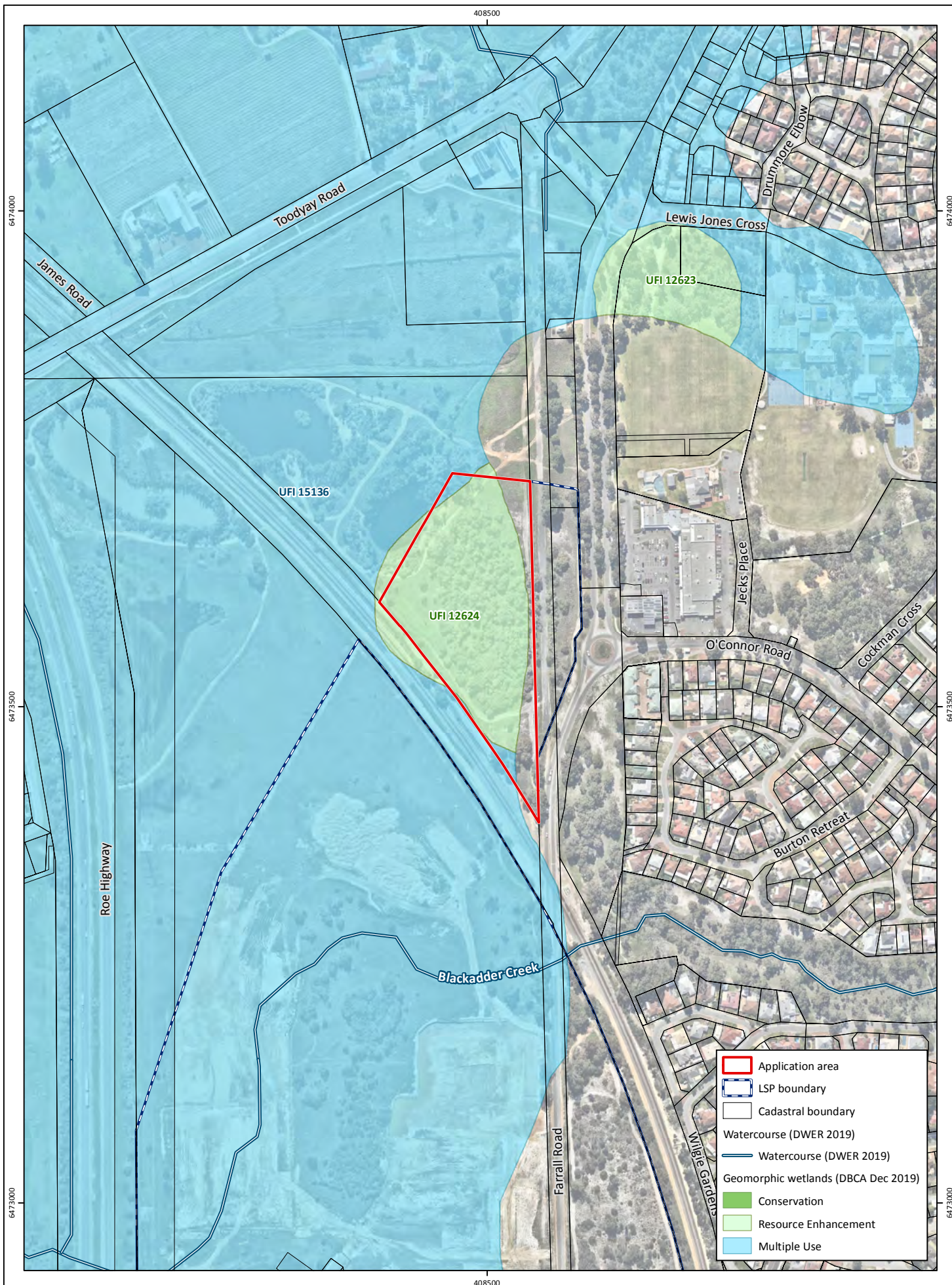
**Plan Number:**  
EP16-009(24)-F146  
**Drawn:** KNM  
**Date:** 07/11/2019  
**Checked:** CKK  
**Approved:** TAA  
**Date:** 10/12/2019



0 100 200  
Metres  
Scale: 1:10,000@A4  
GDA 1994 MGA Zone 50







**Figure 2: Hydrological Features**

**Project:** Northern Wetland Clearing Permit  
Movida Estate

**Client:** Peet Stratton Pty Ltd

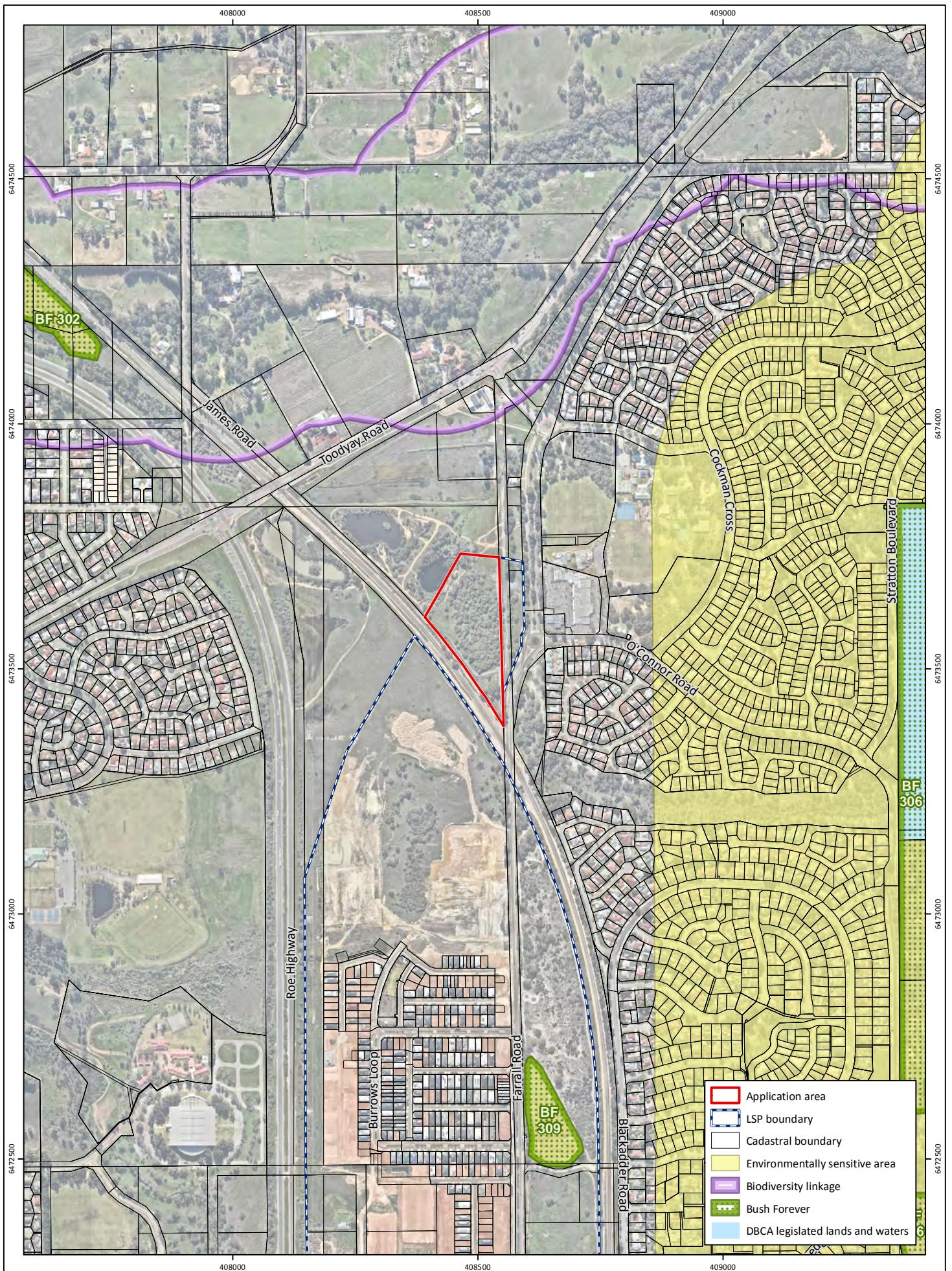
**Plan Number:** EP16-009(24)-F147  
**Drawn:** KNM  
**Date:** 07/11/2019  
**Checked:** CKK  
**Approved:** TAA  
**Date:** 10/12/2019



0 50 100  
Metres  
Scale: 1:5,000@A4  
GDA 1994 MGA Zone 50

**emerge**  
ASSOCIATES





**Figure 3: Environmental Features**

**Project:** Northern Wetland Clearing Permit  
Movida Estate  
**Client:** Peet Stratton Pty Ltd

**Plan Number:**  
EP16-009(24)-F148  
**Drawn:** KNM  
**Date:** 07/11/2019  
**Checked:** CKK  
**Approved:** TAA  
**Date:** 10/12/2019



0 100 200  
Metres  
Scale: 1:10,000@A4  
GDA 1994 MGA Zone 50







**Figure 4: Plant Communities**

**Project:** Northern Wetland Clearing Permit  
Movida Estate  
**Client:** Peet Stratton Pty Ltd

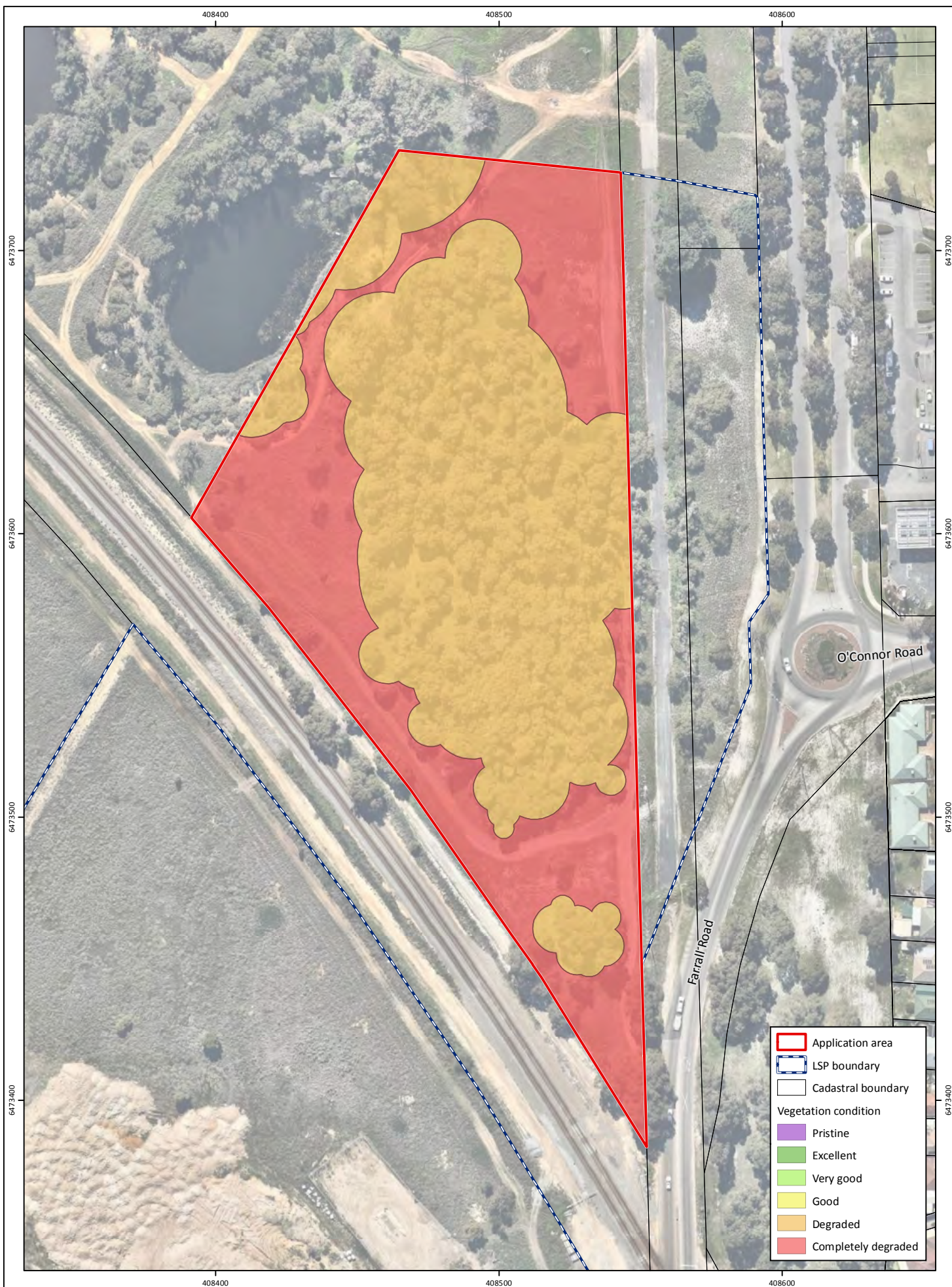
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**Drawn:** KNM  
**Date:** 07/11/2019  
**Checked:** CKK  
**Approved:** TAA  
**Date:** 10/12/2019



0 20 40  
Metres  
**Scale: 1:1,750@A4**  
GDA 1994 MGA Zone 50

**emerge**  
ASSOCIATES





**Figure 5: Vegetation Condition**

**Project:** Northern Wetland Clearing Permit  
Movida Estate

**Client:** Peet Stratton Pty Ltd

**Plan Number:**  
EP16-009(24)-F150

**Drawn:** KNM

**Date:** 07/11/2019

**Checked:** CKK

**Approved:** TAA

**Date:** 10/12/2019



0 20 40

Metres

**Scale:** 1:1,750@A4

GDA 1994 MGA Zone 50

**emerge**  
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# Attachment 1

Clearing Permit (C1 Area) Application Form and Documentation



Attachments 1-3 has been redacted

# Attachment 4

Movida Estate – Stage 11 Bulk Earthworks Plan





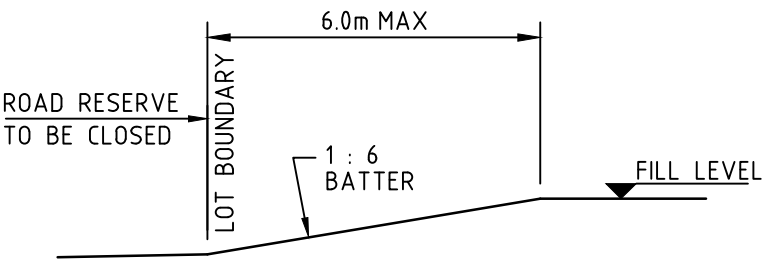


NOTES:

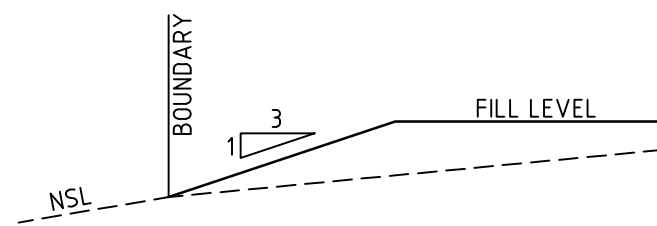
1. THE CONTRACTOR SHALL LIAISE WITH ALL RELEVANT AUTHORITIES TO LOCATE ANY EXISTING SERVICES WITHIN THE CONTRACT AREA PRIOR TO THE COMMENCEMENT OF WORK.
2. THE CONTRACTOR SHALL DETERMINE ALL LEVELS FROM ESTABLISHED BENCHMARKS AS PROVIDED BY THE PROJECT SURVEYOR. ALL BENCHMARKS ARE TO BE PROTECTED.
3. THE CONTRACTOR SHALL BE BOUND TO THE "GUIDELINES FOR ASSESSMENT AND CONTROL OF DUST AND WINDBORNE MATERIAL FOR LAND DEVELOPED SITES" (INCLUDING APPENDICES 1 & 2) PUBLISHED BY THE D.E.P. - NOVEMBER 1996. SITE CLASSIFICATION AS SPECIFIED AND SHALL APPLY FOR THESE WORKS OTHERWISE VARIED BY THE SUPERINTENDENT.
4. ALL EARTHWORKS TO BE RESTRICTED TO THE LIMIT OF CONTRACT BOUNDARY. NO MACHINERY MOVEMENTS TO OCCUR OUTSIDE LIMIT OF CONTRACT BOUNDARY WITHOUT APPROVAL OF THE SUPERINTENDENT
5. THE CONTRACTOR SHALL REFER TO THE SPECIAL REQUIREMENTS SECTION OF THE SPECIFICATION.
6. REFERENCE SHALL BE MADE TO THE RELEVANT CLAUSES OF THE EARTHWORKS SPECIFICATION THE ENTIRE CONTRACT AREA (EXCEPT ROAD PAVEMENTS) SHALL BE STABILISED IN ACCORDANCE WITH THE SPECIFICATION
7. THE CONTRACTOR SHALL TAKE CARE WITH THE USE OF COMPACTION EQUIPMENT WITHIN THE VICINITY OF THE EXISTING RESIDENCES SO AS TO AVOID VIBRATION DAMAGE TO BUILDINGS. COST OF REPAIRS FOR ANY DAMAGE INCURRED WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
8. SOME EXISTING TREES WITHIN THE CONTRACT BOUNDARY WILL BE FLAGGED AND ARE NOT TO BE DISTURBED. CLEARING IS NOT TO COMMENCE UNTIL THE TREES ARE IDENTIFIED BY THE SUPERINTENDENT
9. CONTRACTOR TO STRIP TOPSOIL AND STOCKPILE ON SITE IN AREAS AGREED TO BY THE SUPERINTENDENT. RESPREAD TOPSOIL OVER NOMINATED EARTHWORKS AREA ON COMPLETION OF EARTHWORKS (EXCLUDING PAVEMENT AREAS).
10. CONTRACTOR TO LIAISE WITH RELEVANT SERVICE AUTHORITIES REGARDING COMPACTION REQUIREMENTS IN THE VICINITY OF EXISTING SERVICES.
11. CONTRACTOR TO ENSURE GRADES ADJACENT TO ROAD FRONTAGE TO BE 1:6 MAX.

LEGEND

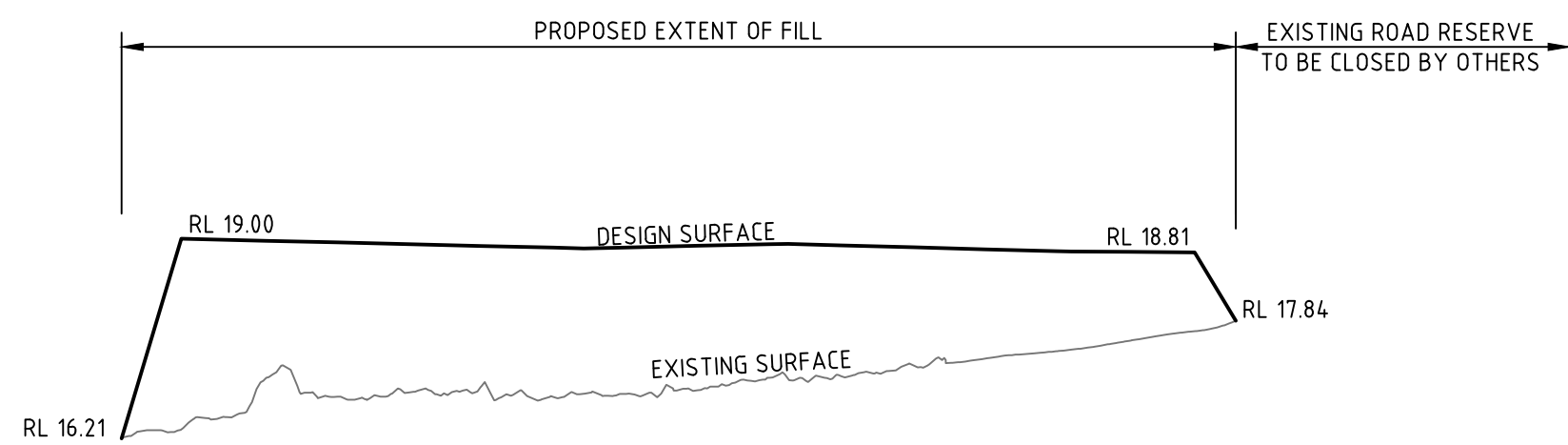
- EXISTING SURFACE CONTOUR (0.25m INTERVAL)
- FINISHED SURFACE CONTOUR (0.25m INTERVAL)
- EARTHWORKS BOUNDARY
- MGL GROUNDWATER CONTOURS (APPROX)
- FINISHED EARTHWORKED LOT LEVEL
- PROPOSED RETAINING WALL
- FUTURE RETAINING WALL
- EXISTING RETAINING WALL
- EXISTING TREES TO REMAIN
- EXISTING OVERHEAD POWER
- EXISTING DRAINAGE
- EXISTING WATER
- EXISTING SEWER



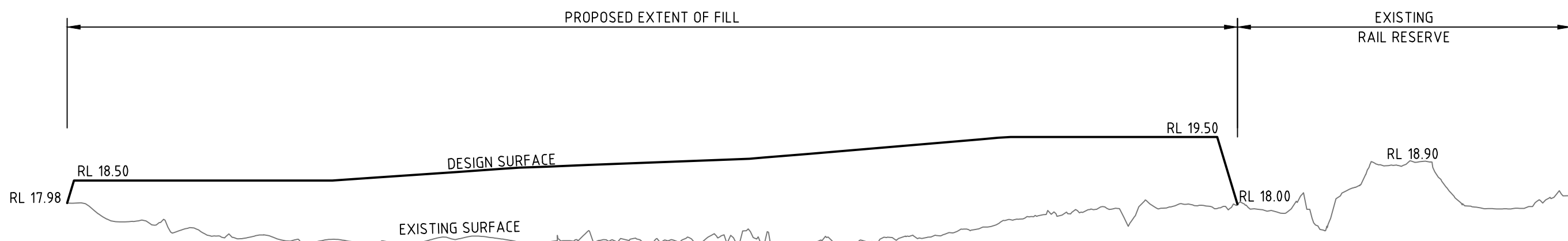
BATTER DETAIL FOR LOTS  
FRONTING OLD FARRALL ROAD  
N.T.S.



TYPICAL BATTER TO NSL  
N.T.S.



SECTION B FINAL SURFACE SECTION  
SCALES H 1:1000  
V 1:100



SECTION A FINAL SURFACE SECTION  
SCALES H 1:1000  
V 1:100



NOTE:  
ALL COORDINATES SHOWN ON THIS DRAWING SHALL BE VERIFIED BY  
CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS. ANY  
DISCREPANCIES TO BE REPORTED TO THE ENGINEER IMMEDIATELY.

CLIENT

PEET STRATTON  
PTY LTD



DRAWN J. Barram  
DESIGNED J. Barram  
CHECKED  
APPROVED  
DATE

TITLE

MOVIDA ESTATE - STAGE 11  
BULK EARTHWORKS PLAN

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consultingcivilengineers

38 Richardson Street  
West Perth WA 6005  
phone 9481 4255  
fax 9481 3900

info@civilgroup.com.au  
www.civilgroup.com.au



ORIGINAL  
SHEET  
SIZE

A1  
DO NOT  
SCALE

SCALE 1:1000 UNO

LEVEL DATUM : AHD

SHEET 1 OF 1

DRAWING No

7881-11-SK001 B



LSP No. 17- 42



# Attachment 5

Plant species list





**Flora Species List - Part Lot 9008 Farrall Road, Midvale**

Note: \* denotes introduced weed species, PI=planted, DP=declared pest under the BAM Act, WoNS=weed of National significance

| Family                  | Status | Species   |
|-------------------------|--------|---|
| <b>Anacardiaceae</b>    | *      | <i>Schinus terebinthifolius</i>                             |
| <b>Araceae</b>          | DP     | <i>Zantedeschia aethiopica</i>                              |
| <b>Asteraceae</b>       | *      | <i>Conyza bonariensis</i>                                   |
|                         | *      | <i>Hypochaeris glabra</i>                                   |
|                         | *      | <i>Ursinia anthemoides</i>                                  |
|                         | *      | <i>Cirsium vulgare</i>                                      |
| <b>Boraginaceae</b>     | *      | <i>Echium plantagineum</i>                                  |
| <b>Campanulaceae</b>    | *      | <i>Wahlenbergia capensis</i>                                |
| <b>Casuarinaceae</b>    | *      | <i>Allocasuarina fraseriana</i><br><i>Casuarina glauca</i>  |
| <b>Centrolepidaceae</b> |        | <i>Centrolepis aristata</i>                                 |
| <b>Fabaceae</b>         | *      | <i>Acacia longifolia</i><br><i>Acacia saligna</i>           |
|                         | *      | <i>Chamaecytisus palmensis</i><br><i>Kennedia prostrata</i> |
|                         | *      | <i>Lotus subbiflorus</i>                                    |
|                         | *      | <i>Trifolium campestre</i>                                  |
|                         | *      | <i>Trifolium arvense</i>                                    |
|                         | *      | <i>Genista linifolia</i>                                    |
| <b>Geraniaceae</b>      | *      | <i>Pelargonium capitatum</i>                                |
| <b>Haemodoraceae</b>    |        | <i>Conostylis aculeata</i>                                  |
| <b>Iridaceae</b>        | *      | <i>Gladiolus caryophyllaceus</i>                            |
|                         | *      | <i>Hesperantha falcata</i>                                  |
|                         | *      | <i>Watsonia meriana</i> var. <i>bulbillifera</i>            |
| <b>Juncaceae</b>        |        |   |



# Flora Species List - Part Lot 9008 Farrall Road, Midvale

Note: \* denotes introduced weed species, PI=planted, DP=declared pest under the BAM Act, WoNS=weed of National significance

| Family                | Status | Species   |
|-----------------------|--------|---|
|                       |        | <i>Juncus pallidus</i>  |
| <b>Moraceae</b>       | *      | <i>Ficus carica</i>   |
| <b>Myrtaceae</b>      |        | <i>Astartea scoparia</i><br><i>Calothamnus quadrifidus</i><br><i>Corymbia calophylla</i><br><i>Eucalyptus rudis</i>   |
|                       | *      | <i>Eucalyptus camaldulensis</i><br><i>Melaleuca incana</i><br><i>Melaleuca lateritia</i><br><i>Melaleuca preissiana</i><br><i>Melaleuca raphiophylla</i><br><i>Taxandria linearifolia</i> |
| <b>Orobanchaceae</b>  | *      | <i>Orobanche minor</i>  |
| <b>Papaveraceae</b>   | *      | <i>Fumaria capreolata</i>   |
| <b>Phytolaccaceae</b> | *      | <i>Phytolacca octandra</i>  |
| <b>Poaceae</b>        | *      | <i>Briza maxima</i>   |
|                       | *      | <i>Briza minor</i>  |
|                       | *      | <i>Bromus diandrus</i>  |
|                       | *      | <i>Cortaderia selloana</i>  |
|                       | *      | <i>Ehrharta calycina</i>  |
|                       | *      | <i>Ehrharta longifolia</i>  |
|                       | *      | <i>Eragrostis curvula</i>   |
|                       | *      | <i>Paspalum dilatatum</i>   |
|                       | *      | <i>Holcus lanatus</i>   |
|                       | *      | <i>Lolium sp.</i><br><i>Rytidosperma ?caespitosum</i>   |
| <b>Polygonaceae</b>   | *      | <i>Rumex crispus</i>  |
| <b>Proteaceae</b>     |        | <i>Adenanthos cygnorum</i><br><i>Stirlingia latifolia</i>   |

**Flora Species List - Part Lot 9008 Farrall Road, Midvale**

Note: \* denotes introduced weed species, Pl=planted, DP=declared pest under the BAM Act, WoNS=weed of National significance

| Family       | Status | Species                     |
|--------------|--------|-----------------------------|
| Restionaceae |        | <i>Dielsia stenostachya</i> |
| Solanaceae   | *      | <i>Solanum nigrum</i>       |
| Typhaceae    | *      | <i>Typha orientalis</i>     |



# Attachment 6

Wetland evaluation





## PRELIMINARY EVALUATION CRITERIA

REW UFI No. 12624

| No. | Criteria   | Y/N |
|-----|--|-----|
| 1   | The wetland is currently recognised as internationally or nationally significant for its natural values. Lists/registers include:  |     |
|     | The Ramsar Convention on Wetlands  | N   |
|     | State government endorsed candidate sites for the Ramsar Convention on Wetlands  | N   |
|     | Directory of Important Wetlands in Australia   | N   |
|     | National Heritage List   | N   |
|     | Or equivalent.   | N   |
| 2   | The wetland is spatially dominated by vegetation in a good or better condition using the vegetation condition scale outlined in Appendix B and is identified as significant for its natural values under one or more of the following:   |     |
|     | <i>Conservation Reserves for Western Australia Systems 1, 2, 3, 5</i>  | N   |
|     | <i>Conservation Reserves for Western Australia, The Darling System – System 6</i>  | N   |
|     | <i>A Systematic Overview of Environmental Values of the Wetlands, Rivers and Estuaries of the Busselton – Walpole Region</i>   | N   |
|     | <i>The Environmental Significance of Wetlands in the Perth to Bunbury Region</i>   | N   |
|     | <i>Bush Forever, Swan Bioplan</i> (including <i>Peel Regionally Significant Natural Area s</i> ) or equivalent.  | N   |
| 3   | The wetland supports a breeding, roosting, or refuge site or a critical feeding site for populations of fauna listed by the Australian Government (for example, <i>Environment Protection and Biodiversity Conservation Act 1999</i> , migratory bird agreements such as JAMBA, CAMBA and RoKAMBA) or the State (for example, threatened and specially protected fauna listed under the <i>Wildlife Conservation Act 1950</i> ). | N   |
| 4   | The wetland is spatially dominated by vegetation in a good or better condition using the vegetation condition scale outlined in Appendix B and supports one or more of the following:  |     |
|     | An occurrence of a Threatened Ecological Community   | N   |
|     | A confirmed occurrence of a Priority 1 or Priority 2 Ecological Community  | N   |
|     | A confirmed occurrence of a Declared Rare (Threatened) flora species.  | N   |
| 5   | Equal to or greater than 90% of the wetland supports vegetation in a good or better condition using the vegetation condition scale outlined in Appendix B.   | N   |
| 6   | The wetland is spatially dominated by vegetation in a good or better condition using the vegetation condition scale outlined in Appendix B and is known to support internationally, nationally or state-wide scientific values including geoheritage and geoconservation.  | N   |
| 7   | The wetland is spatially dominated by vegetation in a good or better condition using the vegetation condition scale outlined in Appendix B and meets one of the following:   | N   |
|     | ≤10% of wetlands of the same type are assigned Conservation management category within the Swan Coastal Plain (by area)  | N   |
|     | ≤10% of all wetlands in the same consanguineous suite are assigned Conservation management category (by area)  | N   |
|     | ≤10% of wetlands of the same type in its consanguineous suite are assigned Conservation management category (by area)  | N   |
|     | best representative of its type within its consanguineous suite domain.  | N   |

Note: If a wetland does not satisfy any of the above preliminary evaluation criteria or, does satisfy the preliminary evaluation criteria but is not considered to be commensurate with the values of a Conservation management category wetland then a secondary evaluation including a full site assessment is required. Refer to Step 3 and 4 of the evaluation procedure which indicates the process for conducting a secondary evaluation.

|        |                               |
|--------|-------------------------------|
| Result | Secondary evaluation required |
|--------|-------------------------------|

DBCA A methodology for the evaluation of wetlands on the Swan Coastal Plain, WA (December 2017)



## SECONDARY EVALUATION CRITERIA

REW UFI No. 12624

| Attributes/functions /values | General criteria    | Number | Criteria  | Y/N         | Score |
|------------------------------|---------------------|--------|---|-------------|-------|
| <b>Geomorphology</b>         | Representative-ness | 1      | ≤20% of wetlands of the same type are assigned Conservation on the Swan Coastal Plain by area.  | N           |       |
|                              |                     | 2      | ≤20% of wetlands in the same consanguineous suite are assigned Conservation by area.  | Y           | H     |
|                              |                     | 3      | ≤20% of wetlands of the same type in the same consanguineous suite are assigned Conservation by area.   | N           |       |
|                              |                     | 4      | The wetland is outstanding in some geomorphic aspect, for example size, origin, height relative to sea level, depth, age.   | N           |       |
|                              | Naturalness         | 5      | Alteration to the wetland's geomorphology by % area:<br>< 25% altered (=H)<br>25-75% altered (=I)<br>> 75% altered. (=L)  | Y<br>N<br>N | H     |
|                              | Scarcity            | 6      | The wetland exhibits unusual geomorphology or unusual internal geomorphic features compared to other wetlands of the same type in the consanguineous suite.   | N           |       |
|                              |                     | 7      | The wetland is the best example of its type in its consanguineous suite.  | N           |       |
| <b>Wetland processes</b>     | Representative-ness | 8      | The wetland is an important component of the natural hydrological cycle providing natural functions (e.g. flood protection and recharge/discharge).   | N           | I     |
|                              |                     |        | The wetland's vegetation, geomorphology, hydrology or sediments are modified; however, the wetland is still a component of the hydrological cycle providing natural and artificial functions (e.g. flood remediation, recharge/discharge and hydrological storage).                                   | Y           |       |
|                              |                     |        | The wetland's vegetation, geomorphology, hydrology or sediments are modified to the extent that the wetlands hydrological functions are artificial such as storage, or the wetland has been disconnected from the natural hydrological cycle and no longer provides natural attributes and functions. | N           |       |
|                              |                     | 9      | The wetland supports a representative process (e.g. wetland process typical of the wetland's hydrological setting, sediment accretionary process typical of the wetland's geomorphic setting or hydrochemical process typical of the wetland's geological setting).                                   | N           |       |

|          |                     |    |   |             |   |
|----------|---------------------|----|---|-------------|---|
|          | Naturalness         | 10 | <p>The wetland is not subject to altered wetland processes or, is subject to altered wetland processes and the wetland's natural attributes and functions are maintained.</p> <p>The wetland is subject to altered wetland processes and the wetland's natural attributes and functions have been changed; however, they have the potential to be rehabilitated.</p> <p>The wetland is subject to altered wetland processes to the extent that the wetland no longer supports natural attributes and functions.</p> | N           | I |
|          | Scarcity            | 11 | The wetland exhibits unusual processes (e.g. hydrological, sedimentological, chemical, biological) compared to other wetlands of the same type in the consanguineous suite.   | N           |   |
| Linkages | Representative-ness | 12 | The wetland is a hydrological link in a larger or more complex and intact system.   | N           | y |
|          | Naturalness         | 13 | <p>The wetland is part of a continuous ecological linkage or wildlife corridor, or a regionally significant ecological linkage or wildlife corridor connecting bushland or wetland areas.</p> <p>The wetland is part of a fragmented ecological linkage or wildlife corridor. The wetland is disturbed and isolated, surrounded by either a built or highly disturbed environment with no nearby native vegetation or waterways to support an intact or fragmented ecological linkage or wildlife corridor.</p>     | N<br>Y<br>N |   |
|          | Scarcity            | 14 | The wetland has unusual hydrological, hydrochemical or ecological linkages with adjacent wetland or bushland.   | N           |   |
| Habitats | Representative-ness | 15 | The wetland is isolated from other undisturbed wetlands or bushland and as a result, maintains important ecological or genetic fauna or flora diversity within its consanguineous suite domain.   | N           |   |
|          |                     | 16 | <p>The wetland contains evidence of surface water or groundwater expression that is vital for maintaining regionally significant populations of native aquatic or terrestrial flora or fauna.</p> <p>The wetland contains evidence of surface water or groundwater expression that is important for maintaining populations of native aquatic or terrestrial flora or fauna.</p>  | N<br>N      |   |
|          |                     | 17 | The wetland provides a nursery for native fauna populations, or maintains fauna populations at a vulnerable stage of their life cycle.  | N           |   |

**Flora**

|                     |    |  |             |   |
|---------------------|----|--|-------------|---|
| Naturalness         | 18 | The wetland supports habitats that are unaltered or the wetland has been altered and its natural habitats are maintained. The wetland supports habitats that are altered; however, the habitats are still identifiable and have the potential to be rehabilitated. The wetland is altered and as a result is no longer supporting natural habitats which can be rehabilitated. | N<br>Y<br>N | I |
|                     | 19 | The wetland supports habitats that are unusual compared to other wetlands of the same type on the Swan Coastal Plain.  | N           |   |
| Representative-ness | 20 | The wetland's current diversity of native flora is similar to what would be expected in an unaltered state. The wetland supports a reduced diversity of native flora due to human induced disturbances. The wetland supports a significantly reduced diversity of native flora species due to human induced disturbances.  | N<br>N<br>Y | L |
|                     | 21 | The wetland is identified in a vegetation complex (Hedde et al. 1980) which is represented by:<br>≤30% of the pre-European extent<br>30-50% of the pre-European extent.  | Y<br>N      | H |
| Naturalness         | 22 | Using the vegetation condition scale outlined in Appendix B, the wetland's vegetation condition by area is:<br>≥ 75% Good, Very Good, Excellent or Pristine<br>25-75% Good, Very Good, Excellent or Pristine<br>< 25% Good, Very Good, Excellent or Pristine.  | N<br>N<br>Y | L |
|                     | 23 | The wetland or ≥ 50% of the wetland boundary is surrounded by land dominated by remnant native vegetation. The wetland or 10-50% of the wetland boundary is surrounded by land dominated by remnant native vegetation. The wetland or < 10% of the wetland boundary is surrounded by land dominated by remnant native vegetation.  | N<br>N<br>Y | L |
| Scarcity            | 24 | The wetland supports an occurrence of Declared Rare, Priority 1, Priority 2, Priority 3 or Priority 4 flora, or an occurrence of 3 or more significant flora taxa.   | N           |   |
|                     | 25 | The wetland is likely to support Declared Rare, Priority 1, Priority 2, Priority 3 or Priority 4 flora; however, the occurrence cannot be located or its habitat has been altered and is no longer in a natural state.   | N           |   |

|       |                     |    |   |        |   |
|-------|---------------------|----|---|--------|---|
| Fauna |                     | 26 | The wetland supports an occurrence of a Threatened Ecological Community, Priority 1 or Priority 2 ecological community.   | N      |   |
|       |                     | 27 | The wetland supports an occurrence of a Priority 3 or Priority 4 ecological community.  | N      |   |
|       | Representative-ness | 28 | The wetland is an ecological refuge for regionally significant fauna species or fauna assemblages.<br>The wetland has the potential to be an ecological refuge but is disturbed and its attributes and functions require rehabilitation.  | N<br>Y | I |
|       |                     | 29 | The wetland supports a permanent or seasonal feeding, breeding, roosting or watering site for regionally significant native fauna.<br>The wetland supports a permanent or seasonal feeding, breeding, roosting or watering site for regional or local fauna but only in association with other surrounding natural areas. | N<br>N |   |
|       | Naturalness         | 30 | The wetland's current diversity of native fauna is similar to what would be expected in an unaltered state, or the wetland supports diverse fauna compared to other wetlands of the same type.<br>The wetland supports a reduced diversity of fauna compared to other wetlands of the same type.                          | N<br>Y | I |
|       |                     |    | The wetland supports limited attributes and functions for fauna populations due to human induced disturbances.  | Y      | L |
|       | Scarcity            | 31 | The wetland is likely to support a breeding, roosting, refuge or feeding site for populations of fauna listed by the Commonwealth (e.g. EPBC Act 1999, JAMBA, CAMBA, RoKAMBA Agreements) or the State (e.g. Threatened or Specially Protected Fauna listed under the Wildlife Conservation Act 1950).                     | N      |   |
|       |                     | 32 | The wetland supports a breeding, roosting, refuge or feeding site for Priority 1, Priority 2, Priority 3 or Priority 4 fauna.   | N      |   |
|       |                     | 33 | The wetland supports an occurrence of a Threatened Ecological Community, Priority 1 or Priority 2 ecological community.   | N      |   |
|       |                     | 34 | The wetland supports an occurrence of a Priority 3 or Priority 4 ecological community or a breeding, roosting, refuge or feeding site for significant fauna.  | N      |   |

|                                   |                         |    |   |             |   |
|-----------------------------------|-------------------------|----|---|-------------|---|
| <b>Cultural</b>                   | Representative-<br>ness | 35 | The wetland or its immediate surrounds is identified for its natural values on a national or State heritage list or the wetland supports other known regional heritage values.  | N           |   |
|                                   |                         | 36 | The wetland or its immediate surrounds is identified for its natural values on a municipal heritage list or the wetland supports other known local heritage values.   | N           |   |
|                                   |                         | 37 | The wetland or its immediate surrounds is identified on a national, State or local list or register for its Aboriginal cultural value (e.g. Department of Aboriginal Affairs register).   | Y           | H |
|                                   |                         | 38 | The wetland is important to the local community either nationally or state wide for its natural values.   | N           |   |
|                                   |                         | 39 | The wetland is or has the potential to be a site for public or private based recreation.  | N           |   |
|                                   |                         | 40 | The wetland is the subject of a recognised ecological restoration / rehabilitation project by a community group, landowner or land manager that aims to improve the wetland's natural, heritage, cultural or social values<br>The wetland is likely to support heritage, cultural or social values; however, the value cannot be confirmed or the value has been disturbed and are no longer as important or significant.<br>The wetland did support heritage, cultural or social values; however, these have been significantly disturbed and are no longer important or the values have been removed. | N<br>N<br>N |   |
| <b>Scientific and educational</b> | Representative-<br>ness | 41 | The wetland supports known important teaching or research characteristics and for this reason is an existing or potential education or research site. Note, the wetland must still support the relevant teaching or research characteristics.<br>The wetland has the potential to be used as a study or research site.  | N<br>N      |   |
|                                   |                         |    | The wetland supports known scientific, geoheritage or geoconservation values.   | N           |   |

## SECONDARY EVALUATION TALLY

REW UFI No. 12624

| Attributes / functions / values      | Scores        |              |          |
|--------------------------------------|---------------|--------------|----------|
|                                      | High          | Intermediate | Low      |
| Geomorphology                        | 2             | 0            | 0        |
| Wetland processes                    | 0             | 2            | 0        |
| Linkages                             | 0             | 0            | 0        |
| Habitats                             | 0             | 1            | 0        |
| Flora                                | 1             | 0            | 3        |
| Fauna                                | 0             | 2            | 1        |
| Cultural                             | 1             | 0            | 0        |
| Scientific and educational           | 0             | 0            | 0        |
| <b>Total score</b>                   | <b>4</b>      | <b>5</b>     | <b>4</b> |
| Defining attributes/functions/values | Geomorphology |              |          |

|                                       |                                 |
|---------------------------------------|---------------------------------|
| <b>Applicable management category</b> | <b>Rehabilitation potential</b> |
|---------------------------------------|---------------------------------|

Updated from DBCA 2017

*A methodology for the evaluation of wetlands on the  
Swan Coastal Plain, Western Australia*





# Attachment 7

Extracts from LSP approval process






#### Extracts from LSP Approval Process

1. *Farrall Road Local Structure Plan No. 42*
2. *Environmental Assessment and Management Strategy, Midvale Local Structure Plan*. Extract pg 33-35. (Emerge Associates 2015 EP14-043(07)—003d VMK)
3. *Farrall Road Local Structure Plan agency comments and proponent responses* (CLE 2015)

**LEGEND****LOCAL RESERVES**

-  Public Open Space
-  Utilities / Infrastructure  
Western Power

**ZONES**

-  Residential - R30/R40/R60/R80

The allocation of residential densities shall be in accordance with the following locational criteria:

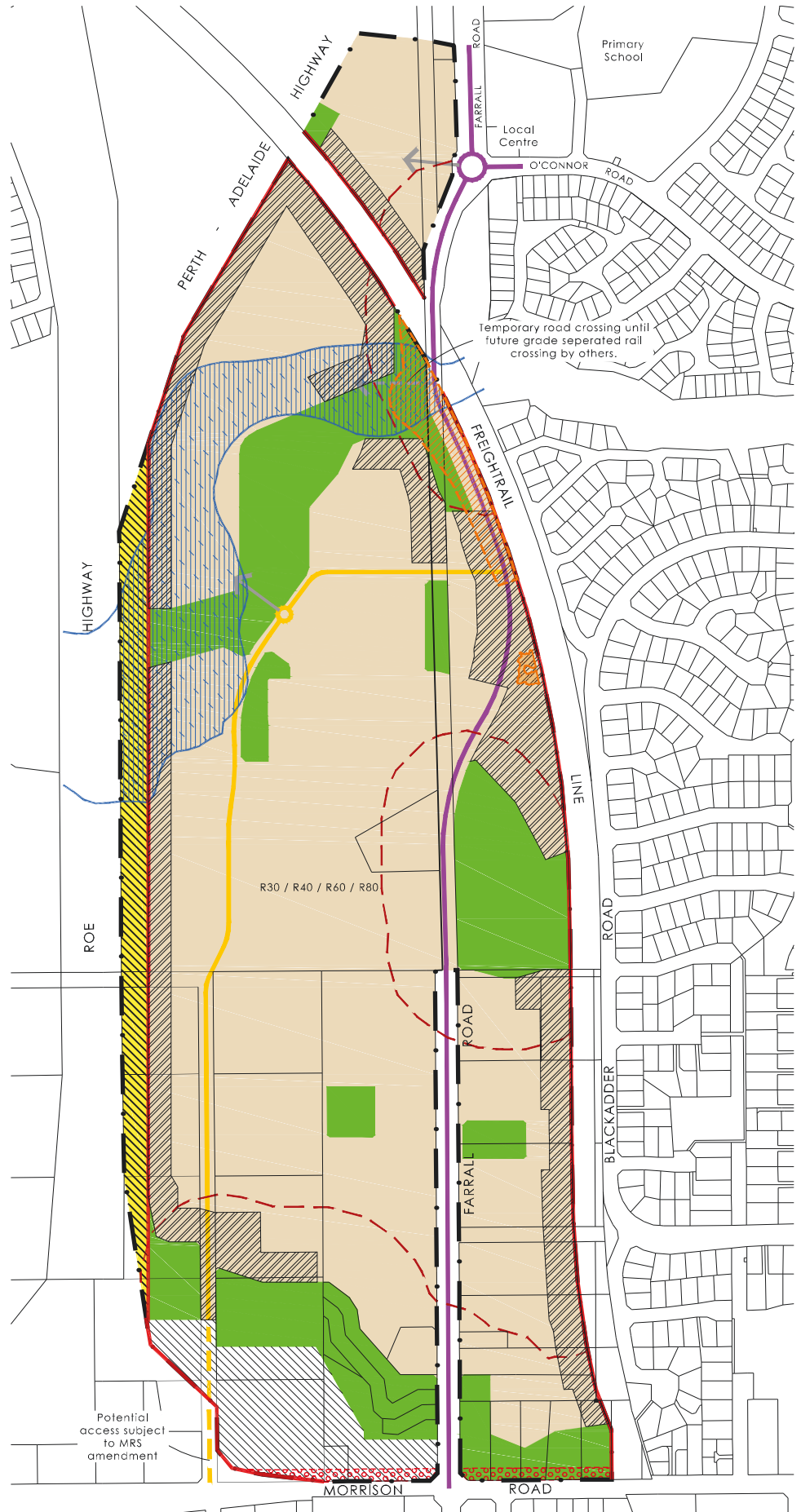
- 1) The R30 density code shall apply as the base code to all 'Residential' zoned lots, with the exception of those lots coded R40 – R80 as set out in 2), 3) and 4) below.
- 2) The R40 density code shall apply to 'Residential' zoned lots where:
  - i) The lot is located within 800m of community centres;
  - ii) The lot is located within 400m of public open space; or
  - iii) The lot is located within 250m of public transport or neighbourhood connector routes.
- 3) The R60 density code shall apply to 'Residential' zoned lots where:
  - i) The lot is located within 400m of community centres;
  - ii) The lot is located within 200m of public open space;
  - iii) The lot is located within 200m of public transport or neighbourhood connector routes.
- 4) The R80 density code shall apply to 'Residential' zoned lots that meet one or more of the criteria set out in 3) above and where:
  - i) The lot is abutting or directly adjacent to public open space not less than 3,000m<sup>2</sup> in area; or
  - ii) The lot is greater than 800m<sup>2</sup>, excluding balance of title lots.

**OTHER**

-  Structure Plan Boundary
-  District Distributor B
-  Neighbourhood Connector
-  Access Street
-  Area subject to Future Planning Investigation.
-  Area subject to future investigation for grade separated railway crossing
-  Area Subject to Further Investigation
-  Designated Bushfire Prone Area (100m setback from bushfire hazard)
-  Western Power Easement (16m wide) (Local Development Plan required)
-  Flood Prone Areas (Local Development Plan required)
-  Dwellings subject to Quiet House Design principles (Local Development Plan required)
-  Noise Wall (indicative)

**Notes:**

1. Local road network and public open space is indicative only and subject to change and refinement at subdivision stage.
2. Notwithstanding any statement to the contrary with AS3959-2009, (or relevant equivalent) any Class 1, 2 or 3 buildings or a class 10a building or deck associated with a Class 1, 2 or 3 building to be erected on residential lots within Structure Plan 42, that are either partly or wholly within 100 metres of the 'extreme' or 'moderate' Bushfire risk areas as identified in 'Appendix 8 - Fire Management Plan' or shall comply with the requirements of AS3959-2009, or equivalent Australian Standard.

**PLAN A: LOCAL STRUCTURE PLAN**

**ENVIRONMENTAL ASSESSMENT AND MANAGEMENT STRATEGY**  
MIDVALE LOCAL STRUCTURE PLAN

Woodbridge Creek. Discharge from these flood storage areas will be designed to ensure that pre-development flow rates leaving the site are maintained (Emerge Associates 2015a).

A typical cross section illustrating the accommodation of drainage areas within the public open space areas associated with each waterway is provided in **Appendix E**. Please refer to the LSP's LWMS (Emerge Associates 2015a) and the LOSMP (Place Laboratory 2015) for further details.

#### 4.6.3 Future surface water management requirements

The Environmental Management Plan to be prepared to support subdivision within the site will outline the management requirement associated with the Blackadder and Woodbridge Creeks, including fencing, weed control, revegetation works, fauna management, landscape treatments etc. and will be prepared to support future subdivision within the site, in accordance with the WAPC standard subdivision condition EN1 which states:

*Prior to the commencement of subdivisional works an environmental management plan is to be prepared and approved to ensure the protection and management of the sites environmental assets with satisfactory arrangements being made for the implementation of the approved plan*

An Urban Water Management Plan (UWMP) will be required for each stage of subdivision within the site, in order to address WAPC's standard model subdivision condition D2 (WAPC 2012) which states:

*Prior to the commencement of subdivisional works, an urban water management plan is to be prepared and approved, in consultation with the Department of Water, consistent with any approved Local Water Management Strategy. (Local Government).*

#### 4.6.4 Predicted environmental outcomes

The ecological and hydrological features of Blackadder Creek and Woodbridge Creek will be enhanced and improved while incorporating adequate flood conveyance corridors to ensure flood events will not pose risks to development within the site.

The LWMS provides the framework for the LSP to manage surface water within the site in a contemporary best-practice approach utilising WSUD objectives, and in accordance with the WAPC and EPA guidelines and policy frameworks. The preparation of a UWMP at future subdivision will provide design details for WSUD within the site and will ensure the sustainable use of surface water resources.

### 4.7 Hydrology – Wetlands

#### 4.7.1 Policy framework and management objective

*State Planning Policy 2.9 Water Resources* (WAPC 2006) outlines the following key policy objectives for the management of wetlands:

- Protect, conserve and enhance water resources that are identified as having significant economic, social, cultural and/or environmental values;
- Assist in ensuring the availability of suitable water resources to maintain essential requirements for human and all other biological life with attention to maintaining or improving the quality and quantity of water resources; and
- Promote and assist in the management and sustainable use of water resources.

**ENVIRONMENTAL ASSESSMENT AND MANAGEMENT STRATEGY**  
MIDVALE LOCAL STRUCTURE PLAN

Of particular relevance for the site, key policy measures for Multiple Use (MU) wetlands outlined in *State Planning Policy 2.9* include:

- Ensure use of best management practices in the development and use of multiple use wetlands, consistent with the principles of total water cycle management.
- Ensure adequate and appropriate buffering of wetlands, waterways and estuaries to maintain or enhance the environmental attributes, functions and values of the water resource and minimise the impact of nearby land uses, both existing and future.

#### 4.7.2 LSP considerations for wetlands

Spatial consideration for wetlands within the site has been provided through the retention and placement of public open space over remnant vegetation in the east of the site associated with Bush Forever Site No. 309. This vegetation is mapped as MU wetland (as is the majority of the site), however the flora and vegetation assessments undertaken for the site by Coffey Environments Pty Ltd (2010) and Emerge Associates (2015b) found it to be representative of CC wetlands and the LSP has accommodated these values accordingly. A 50 m wetland buffer has been provided within the LSP along the north-east edge of the wetland vegetation within Bush Forever Site No. 309, in order to ensure development does not encroach on the wetland values in this area. This buffer will be a landscaped/semi-vegetated strip (incorporating remnant vegetation) between the vegetation associated with the CC representative wetland and proposed development, and will provide a low bushfire threat interface with the built form of development. Existing and future road reserves (e.g. Farrall Road to the west of Bush Forever Site No. 309) provide adequate separation from proposed development.

As outlined in **Section 4.2** above, none of the vegetation is considered to be typically representative of the “Guildford” complex (described as “A mixture of open forest to tall open forest of *Corymbia calophylla* - *Eucalyptus wandoo* - *Eucalyptus marginata* and woodland of *Eucalyptus wandoo* (with rare occurrences of *Eucalyptus lane-poolei*). Minor components include *Eucalyptus rudis* - *Melaleuca raphiophylla*.”) including the vegetation present within wetlands. Vegetation within the RE wetland in the north of the site is in ‘Completely Degraded’ to ‘Degraded’ condition (Emerge Associates 2015a) and consists of *Melaleuca preissiana*, with an understorey dominated by invasive grass and forb species. On this basis the existing RE wetland in the north of the site is not considered a critical asset of the site, is not proposed for retention and is not considered to require an offset.

The requirement for environmental offsets in WA is guided by the *WA Environmental Offset Guidelines* (Government of Western Australia 2014), which states that “environmental offsets will only be applied where the residual impacts of a project are determined to be significant...” The impacts of implementation of the proposed LSP are not considered to be significant and are considered to deliver a net environmental benefit through the retention and ongoing management for conservation of a CC wetland (and Bush Forever), PECs, PF and waterways with riparian vegetation.

The RE wetland (UFI No. 12624) in the north of the site is isolated, separated from other land parcels by Farrall Road, the freight rail and land reserved for the future Perth – Adelaide Highway. The retention of this wetland would pose issues for ongoing maintenance, particularly in regards to security and passive surveillance. Amenity values provided by this isolated parcel would also be limited. Conversations with the City of Swan have indicated their preference to reduce public open space obligations over the site particularly given the large areas of public open space required for existing waterways and flood conveyance.

**ENVIRONMENTAL ASSESSMENT AND MANAGEMENT STRATEGY**  
**MIDVALE LOCAL STRUCTURE PLAN**

In contrast, the Bush Forever site, which contains wetland vegetation (of a similar type to the RE wetland) in 'Excellent' condition and is proposed to be retained for conservation purposes within public open space and managed as part of the urban development of the site. The provision for the retention and/or enhancement of this vegetation (within the Bush Forever site and 50m buffer area) within the LSP will allow for intact wetland values within the site to be retained.

Under the proposed LSP, while this RE wetland is to be removed to accommodate urban development, the development proposes to achieve a net environmental benefit through the enhancement of remaining values across the entire site, such as the protection of the CC representative wetland and significant vegetation values (PF and PEC), creation of a living stream within the realigned Blackadder Creek and the reestablishment of vegetation values associated with this waterway, and through the enhancement of existing riparian values within Woodbridge Creek. In addition, intact wetland values associated with the CC wetland will be retained and subject to a management plan to identify and manage ongoing threats.

#### **4.7.3 Future wetland management requirements**

An Environmental Management Plan is to be prepared as part of future subdivision stages for the ongoing management of wetland values within Bush Forever Site No. 309 in the east of the site, and will detail the ongoing management and maintenance requirements including fencing (limiting access), weed control etc. and will be prepared to support future subdivision.

#### **4.7.4 Predicted environmental outcomes**

Values representative of CC wetlands in the east of the site will be retained within Bush Forever Site No. 309, and weed management and proposed planting regimes within this CC representative wetland and buffer area will contribute to the protection, conservation and enhancement of wetland values, as per the management objective outlined in *State Planning Policy 2.9*. This will also contribute to the net environmental benefit achieved through the development of the site.

MU wetland values present within the site will be utilised in the total water cycle management for the site, outlined in the LWMS report prepared for the LSP, and to be addressed in future UWMPs.

### **4.8 Heritage – Indigenous Heritage**

#### **4.8.1 Policy framework and management objective**

The *Aboriginal Heritage Act 1972* (Aboriginal Heritage Act) makes provision for the preservation of places and objects customarily used by, or traditional to, they original inhabitants of Australia or their descendants, on behalf of the community.

#### **4.8.2 LSP considerations for Indigenous Heritage**

Based on the high level of historic disturbance within the site, there is unlikely to be significant disturbance to Indigenous heritage values through the implementation of the LSP.

Historical Section 18 approvals indicated that the main issues posed to Indigenous heritage within the site were associated with the Blackadder and Woodbridge Creeks. Extensive consultation with Indigenous representatives has been undertaken to determine the response to the proposed enhancement and improvement of the ecological values of the Blackadder Creek (particularly



City of Swan – Planning

| Agency Comments |   | Proponent Response   | Document Modification                     |
|-----------------|---|--|---|
| 1.              | Remove Neighbourhood connector currently shown heading east from Orchard Ave onto Morrison road   | The Local Structure Plan (Plan A) has been updated to remove the Neighbourhood Connector.  | LSP Part One<br>- Plan A                  |
| 2.              | Western power 132KV to be identified on LSP DAPs required for these lots  | The Local Structure Plan (Plan A) has been updated to identify the 132kV Western Power easement (16m wide) along Morrison Road.<br><br>Section 6.2 has been updated to require a Local Development Plan be required for lots within the easement.  | LSP Part One<br>- Plan A                  |
| 3.              | Flood Prone layer to be shown on the structure plan, necessary to reflect which lots will be subject to Development approval DAP may be required for these lots   | The Local Structure Plan (Plan A) has been updated to identify the Flood Prone Area Special Control Area as detailed in the City of Swan's Local Planning Scheme No. 17.<br><br>Section 6.2 has been updated to require a Local Development Plan be required for lots within the Flood Prone Area.   | LSP Part One<br>- Plan A<br>- Section 6.2 |
| 4.              | Insert line to indicate area subject of noise attenuation measures, include reference as to where these measures are outlined DAP required for these lots   | The Local Structure Plan (Plan A) has been updated to identify the first row of housing subject to Quiet House Design as prescribed in the LSP Transportation Noise Assessment.<br><br>Section 6.2 includes the requirement for a Local Development Plan be lots subject to Quiet House Design principles.   | LSP Part One<br>- Plan A<br>- Section 6.2 |
| 5.              | Indicate location of acoustic noise wall  | The Local Structure Plan (Plan A) has been updated to identify the indicative extent of acoustic noise walls as prescribed in the LSP Transportation Noise Assessment.   | LSP Part One<br>- Plan A                  |
| 6.              | Identify public purpose reserve for Water Corp pumping station  | Identification of the Waste Water Pump Station on the Local Structure Plan (Plan A) is premature as Water Corporation approval is required to confirm location of such infrastructure. It would be more appropriate to confirm the location at subdivision design and identify the WWPS site as a separate lot as part of the subdivision application, once Water Corporation approval has been secured. This will ensure the appropriate size and location of the site is determined and will avoid the potential for unnecessary amendments to the Local Structure Plan. | No modification undertaken                |
| 7.              | Require BAL disclaimer to be inserted on plan : Notwithstanding any statement to the contrary with AS3959-2009, (or relevant equivalent) any Class 1, 2 or 3 buildings or a class 10a building or deck associated with a Class 1, 2 or 3 building to be erected on residential lots within Structure Plan 42, that are either partly or wholly within 100 metres of the 'extreme' or 'moderate' Bushfire risk areas as identified in 'Appendix 8 - Fire Management Plan' or shall comply with the requirements of AS3959-2009, or equivalent Australian Standard. | The Local Structure Plan (Plan A) has been updated to include the requested BAL disclaimer and is provided as 'Note 2' on Plan A.  | LSP Part One<br>- Plan A                  |

|     |   |   |  |
|-----|---|---|--|
| 8.  | Remove r-code variations as per the changes to the Regs these can now only be considered in a Local Development Plan or local planning policy. Could still identify types of lots that require DAP minimum lot frontage   | The R-Code Variations Tables (Tables 2A, 2B and 2C) have been deleted from the Local Structure Plan (Part One).<br><br>Additionally, Section 6.3 has been updated to remove reference to R-Code Variations Tables and instead refer to a Local Planning Policy. | LSP Part One<br>- Section 6.3                  |
| 9.  | Western Power wants high voltage power line area to be included within POS reserve for management by the City instead of Public Purpose. Assets have advised this is not preferred, proceed with seeking this to remain as Public Purpose reserve   | Note. The Local Structure Plan (Plan A) is unchanged in this regard.  | No modification undertaken                     |
| 10. | Amend 3.0, 4.0 to remove reference to Part 5A of the Scheme   | Section 3.0 and Section 4.0 of the Local Structure Plan (Part One) have been updated to remove reference to Part 5A of the Scheme and replaced with reference to the <i>Planning and Development (Local Planning Scheme) Regulations 2015</i> .                 | LSP Part One<br>- Section 3.0<br>- Section 4.0 |
| 11. | Amend 5.2.3<br>With regards to the locational criteria mentions being within proximity of activity or community centre. Activity centre is defined as land designated under State Planning Policy, since this area is not identified as an activity centre, should consider removal of this to avoid confusion. | Section 5.2.3 of the Local Structure Plan (Part One) has been updated to remove reference to 'activity' centres and retained reference to 'community' centres.<br><br>The Local Structure Plan (Plan A) has also been updated to reflect this modification.     | LSP Part One<br>- Plan A<br>- Section 5.2.3    |
| 12. | 5.3 update POS schedule in accordance with LWMS requirements  | The review and revision of the LWMS has not resulted in any spatial change to the public open space identified on Plan A or the areas prescribed in Section 5.3. Accordingly, the Local Structure Plan (Part One and Plan A) is unchanged in this regard.       | No modification undertaken                     |
| 13. | 5.4 include Local Development Plan  | Section 5.4 of the Local Structure Plan has been updated to include the preparation of a Local Development Plan as a condition of subdivision which may be imposed, as applicable.  | LSP Part One<br>- Section 5.4                  |
| 14. | Amend 6.1 to remove reference to Part 5A of the City's Scheme   | Section 6.1 of the Local Structure Plan (Part One) have been updated to remove reference to Part 5A of the Scheme and replaced with reference to the <i>Planning and Development (Local Planning Scheme) Regulations 2015</i> .                                 | LSP Part One<br>- Section 6.1                  |
| 15. | Amend 6.2 to refer to Part 6 cl. 47of the Regs as being the means for effect  | Section 6.2 of the Local Structure Plan (Part One) has been updated to refer to Clause 47 of the <i>Planning and Development (Local Planning Scheme) Regulations 2015</i> .   | LSP Part One<br>- Section 6.2                  |
| 16. | Remove 6.3  | Section 6.3 of the Local Structure Plan (Part One) has been updated to remove reference to R-Code Variations Tables and instead refer to a Local Planning Policy as the mechanism by which to implement R-Code Variations.                                      | LSP Part One<br>- Section 6.3                  |
| 17. | Amend 6.5 to read in accordance with the LPS 17 Scheme the land is affected by Part 6 of the Scheme and is mapped as flood prone. Planning approval for land subject of flood shall be as per the provisions of Part 6 of the Scheme  | Section 6.5 of the Local Structure Plan (Part One) has been updated to include development requirements for lots within the Flood Prone Area consistent with the requirements set out in the City of Swan's Local Planning Scheme No. 17.                       | LSP Part One<br>- Section 6.5                  |

City of Swan - Traffic

| Agency Comments |   | Proponent Response  | Document Modification  |
|-----------------|---|---|--|
| 1.              | <p>There are currently 7000vpd on Farrall Road north of Morrison Road.</p> <p>The LSP area has 1300 new residences which would generate approx. 10,300 vpd.</p> <p>According to Table 3 page 24, 77% (40%+6%+31%) would head south on Farrall Road towards Morrison Road, being another 7,931vpd.</p> <p>Based on existing traffic plus proposed traffic we are looking at 14,931vpd for the southern end of Farrall Road just north of Morrison road.</p> <p>City is in the process of preparing a Greater Midland Traffic Study for which Cardno are modelling various scenarios for road modifications into and surrounding Midland, work is still required but this document considers that with the loss of access to Roe Hwy at Morrison Road, traffic along Farrall Road will increase by approximately 2,500vpd with traffic heading along Farrall north to Toodyay Road.</p> | <p>Noted. The revised Transport Assessment (TA) report includes revised traffic projections consistent with this existing traffic count and analysis.</p>   | <p>Transport Assessment</p> <ul style="list-style-type: none"> <li>- Figure 16</li> <li>- Section 6.3</li> </ul> |
| 2.              | <p>At which point we are looking at around 17,500vpd which is will into the need for a dual carriageway to be provided.</p>   | <p>This 17,500vpd maximum on Farrall Rd immediately north of Morrison Rd assumes Roe Hwy overpass at Morrison Rd but no Orchard Ave link from the LSP area to Morrison Rd. Even in that worst case scenario traffic volumes would diminish further north on Farrall Rd to 15,700vpd south of the east-west neighbourhood connector B link and 12,200vpd at the railway crossing. In all other scenarios the traffic volumes would be lower.</p> <p>Liveable Neighbourhoods indicates the capacity of a two-lane divided Integrator B road (as proposed for Farrall Rd) is at least 15,000vpd and can be up to 20,000vpd. "Volumes above 15,000 vehicles per day need detailed design to manage traffic at intersections, facilitate bus movement and deal with parking and access." The MRWA suggested intersection layout at Morrison Rd / Farrall Rd intersection provides appropriate widening of Farrall Road on the northern approach and exit at this intersection but this widening would not need to extend further north than Woodbridge Creek.</p> <p>A short section of Farrall Rd immediately north of Woodbridge Creek would potentially be around 16,000vpd but this section of Farrall Rd already has an existing 30m road reserve, which would allow the extra flexibility in the wider verge to accommodate minor improvements that might be identified at detailed design stage.</p> <p>The proposed two-lane divided Integrator B road standard on Farrall Rd within the LSP area north of Woodbridge Creek is appropriate for the forecast traffic flows within the LSP area.</p> | <p>Transport Assessment</p> <ul style="list-style-type: none"> <li>- Figure 16</li> <li>- Section 6.3</li> </ul> |
| 3.              | <p>Figure 17 page 27; shows the majority of the intersections onto Farrall road as left in/ left out only. In particular there is one section on the east side of the road which only has two left in / left out only so residents would not be able to turn north at all; recommend review;</p>  | <p>In the revised TA report a roundabout is added on Farrall Rd immediately north of the Bush Forever site (at the City's request) and a full movement T-intersection is proposed for access to the eastern cell identified in this comment.</p>  | <p>Transport Assessment</p> <ul style="list-style-type: none"> <li>- Figure 17</li> </ul>                        |
| 4.              | <p>Comment made on page 28 that any laneway connections on to Farrall Road would be restricted to left in /left out only. City does not permit any laneway connections to local distributor and above classified roads.</p>   | <p>Noted. Laneways are not depicted on the statutory LSP plan and would be subject to detailed design during the subdivision design and approval process.</p>   | <p>No modification undertaken</p>  |



|    |   |   |                            |
|----|---|---|----------------------------|
| 5. | <p>Regarding the cross sections. These are general accepted but will require 1.8m paths with 2.3m shared paths on kerb line rather than the property line. Will need 4.3m minimum verge width to allow for street lights on the 2.4m alignment and still fit in 1.8m back of kerb path.</p> <p>Follow up comment: Due to the requirement to reduce verge maintenance costs the City's preference is to place the paths adjacent to the kerb. To address safety issues footpaths are increased in width to a minimum of 1.8m and DUP are increased to 2.3m. On higher volume, faster roads then the kerb line placement of paths is not required however if car parking or cycle lanes are in place on these roads then again the preference is for paths adjacent to the kerb. It is noted that in the cross sections Farrall Rd Typology 1, 2 and 3 parking and cycle lanes are shown.</p> | <p>Liveable Neighbourhoods requires footpaths 1.5m wide offset 0.3m from the property boundary or built at 1.8m wide if abutting the property boundary. Requirement R33 states, "Footpaths should be separated from the street pavement and usually located against or close to the property boundary. Footpaths may only be located abutting kerbs where site constraints preclude alternative siting and where vehicle volumes or road design speeds are low."</p> <p>It appears this issue is only in relation to reducing verge maintenance costs incurred by the City. If the verge is in front of a residential property it is the home owner or resident that is responsible for maintaining the verge, not the City.</p> <ul style="list-style-type: none"> <li>• Access Roads (low traffic volume) – street typology cross-section shows 4.1m verges – can accommodate 1.8m path at property boundary (i.e. adjacent to residential lots), so can avoid the need to widen verges to 4.3m by always locating the path on the residential side of the street.</li> <li>• Character Streets (low traffic volume) – street typology cross-section shows 4.1m verges with embayed parking, so path just fits in between property boundary and parking bays anyway.</li> <li>• Neighbourhood Connector B (less than 3000vpd) - street typology cross-sections show 5.5m verge including embayed parking (Types 1 and 2) or 4.1m verges without embayed parking (Type 3). Paths are required on both sides of a Neighbourhood Connector. Locate paths adjacent to residential property boundaries where applicable. If there is any Type 3 cross-section adjacent to POS widen the verge as appropriate to accommodate whichever type of path adjacent to the POS.</li> <li>• Farrall Rd Typology 1 - street typology cross-section shows 5.5m verges including embayed parking so no need to widen verge.</li> <li>• Farrall Rd Typology 2 - street typology cross-section shows one 5.5m verge including embayed parking (as above) and a 3m verge adjacent to the rail reserve sound wall. Shared path in that 3m verge needs to be widened to 2.3m adjacent to the sound wall anyway (or 0.3m separation, which would just fill up with weeds). Suggest widening the shared path to full width of 3m verge to eliminate maintenance issue (except local narrowing of shared path to 2.3m to accommodate street trees where required).</li> <li>• Farrall Rd Typology 3 - street typology cross-section shows 5.5m-7.0m verges including embayed parking so no need to widen verge.</li> <li>• Farrall Rd Typology 4 - street typology cross-section shows 4.1m verges adjacent to CAPs. Only occurs adjacent to residential properties; no maintenance issue for the City so can locate the paths adjacent to the property boundary. No widening of the verge is required.</li> </ul> | No modification undertaken |
| 6. | <p>2.1m wide parking is only ok for low volume roads with low parking turnover. City requires wider parking bays where traffic volume is higher and more rapid parking turnover is expected.</p> <p>Follow up comment: Any parking on Farrall Road (as indicated in the cross sections) would need to be 2.5m.</p>  | <p>More rapid parking turnover would be expected adjacent to schools, shops and other commercial land uses. This does not apply in the wholly residential part of the LSP area which is all the area north of Woodbridge Creek. All roads within the residential LSP area will be low volume (less than 3000vpd) Access Streets or Neighbourhood Connector B roads except Farrall Road. The only 2.1m parking bays shown on the cross sections are on the Neighbourhood Connector Type 1 and Neighbourhood Connector Type 2 cross sections, which are both low volume Neighbourhood Connector B roads carrying less than 3000vpd in this LSP area, and therefore appropriate for 2.1m wide parking bays. Requirement for any parking embayments on Farrall Rd to be 2.5m wide is noted and can be addressed as part of detailed design.</p>   | No modification undertaken |
| 7. | <p>Left/right staggered intersections won't be permitted. Right/left staggers should be either minimum of 19m from centre line to centre line or City's preference is to have splitter islands on intersecting roads.</p> <p>Follow up comment: Previous experience has shown that it is important to stress this point early in the planning process.</p>  | <p>Noted and can be addressed as part of detailed subdivision design.</p>   | No modification undertaken |

City of Swan - Environmental

| Agency Comments |   | Proponent Response  | Document Modification   |
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| 1.              | <p>Various comments, provided as 'marked up' pages of the report:</p> <ul style="list-style-type: none"> <li>- Change all reference to public open space associated with the waterways to "foreshore reserves"</li> <li>- Provide typical cross section of waterway to demonstrate median width.</li> </ul> | <p>For the purpose of this report, the use of the reference to 'Blackadder and Woodbridge Creek POS area' has been applied when discussing the areas of public open space associated with the waterways of Blackadder and Woodbridge Creek. It is not considered necessary to rename these areas to 'foreshore reserve' for the purposes of this document.</p> <p>The POS areas associated with each waterway have been sized to accommodate the existing hydrological and ecological values of each waterway as determined by the biophysical assessment attached to the EAMS as Appendix C, which was found to be no more than 40m (20m on either side of the creekline) for each waterway.</p> <p>The POS areas provided for the protection and enhancement of the Blackadder and Woodbridge Creeks within the LSP design are provided at a minimum width of between 42 and 60m and will incorporate drainage infrastructure, other public uses and facilities in some areas, whilst protecting the remaining riparian vegetation and the required hydrological functions.</p> | <p>EAMS<br/>Various section of the EAMS have been amended to reflect consistency associated with the definition provided.</p> <p>A typical waterway POS area cross section has now been added as Appendix E to further illustrate the POS areas associated with the waterways.</p>  |
| 2.              | <p>Bush Forever Site 309:</p> <p>Included as POS, however no POS credit will be awarded to the BF Site.</p>   | <p>Noted. The BF site was not included in the POS credit calculations.</p> <p>The Bush Forever site was included within POS for conservation purposes only, and to allow limited public use (e.g. walking paths) within the wetland buffer associated with vegetation within the BF site.</p>   | <p>No modification undertaken</p>   |
| 3.              | <p>Surface water management within LSP:</p> <p>Provide cross sections demonstrating that treatment and infiltration of the 1 year 1 hour ARI events can be accommodated within median swales.</p>   | <p>The EAMS provides a summary of the surface water management outlined in the LWMS prepared for the LSP, and refers to this document for the provision of further detail. Detailed engineering design will be provided as part of detailed design at future subdivision.</p>   | <p>No changes have been made to the EAMS in this regard however clarification of this matter is provided within the LWMS for the site.</p>  |
| 4.              | <p>Aboriginal heritage</p>  | <p>-</p>  | <p>EAMS<br/>Section 4.8 of the report has been updated to provide a more detailed outline of the Aboriginal heritage consultation process that has been undertaken by the proponent, and the results of this process.</p> <p>The results of the Section 18 application have been provided as a new appendix (Appendix E) to the EAMS.</p> |

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| 5. | <p><b>Various comments, provided as ‘marked up’ pages of the report:</b></p> <ul style="list-style-type: none"><li>• Specify 30m waterway buffer instead of 20m buffer (on each side of waterway)</li></ul> | <p>The biophysical assessment of the waterways determined that a 20 m waterway buffer provided on each side of the Creek (total 40 m) is sufficient to accommodate both the hydrological and ecological values associated with the waterways. This biophysical assessment has been reviewed and endorsed by the Department of Water.</p> | <p>No modification undertaken as the Biophysical Assessment clearly articulates the requirements for waterway buffer width based on a comprehensive investigation of both the hydrological and ecological functions of the waterways.</p> |
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| Agency Comments  | Proponent Response   | Document Modifications   |
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| <p>1.</p> <ul style="list-style-type: none"> <li>The DoW disagrees with the statement "Lot scale retention across the majority of the site is not proposed due to the low permeability of underlying clays. Runoff from events greater than the 1 year 1 hour ARI event will be conveyed downstream to Flood Storage Areas (FSAs) via surface flow" (Page 3, third-last paragraph). Through the application of Water Sensitive Urban Design (WSUD) principles, management of the 1 year 1 hour ARI event on lot and within the road reserve should be achievable, particularly as sand filling of the site is proposed to achieve a better lot classification.</li> </ul>  | <p><i>Lot retention of the 1 year 1 hour ARI event has been included for the southern portion of the site.</i></p> <p>As discussed during meetings with DoW the site conditions show low permeability clays, with perched water above the clay. There is no permanent aquifer. We will be proposing to minimise import of fill and this could be as low as 200-300mm in some places, though likely to average perhaps 700mm. We have also analysed the benefits of bringing in fill so that we can soak at site vs the cost of fill and the land downstream and our analysis shows that not only is soakwell installation at lot for small lots problematic in a site like this, it is more expensive. We therefore do not propose at-lot soakage in the northern (low-lying) portion of the site.</p> <p>As to 1yr 1hr in the road reserve, you will note that there are a number of wider road reserves with median swales proposed. These are described in the current document.</p> <p>In order to leave flexibility to consider other WSUD measures in future stages the LWMS will have an additional subsection in to Section 8 indicating that WSUD measures will be further investigated at UWMP stage. This will also be acknowledged within the text of Section 6 (which describes the measures currently proposed).</p> | <p>LWMS<br/>Section 7.1.1 and 7.2.1</p> <ul style="list-style-type: none"> <li>- Revised discussion regarding lot retention</li> </ul> <p>Section 7.1</p> <ul style="list-style-type: none"> <li>- Additional sub-sections for tree-pits and bio-filters as potential WSUD measures</li> </ul> <p>Section 8</p> <ul style="list-style-type: none"> <li>- Additional sub-section indicating that WSUD measures will be further investigated at UWMP stage</li> </ul>  |
| <p>2.</p> <ul style="list-style-type: none"> <li>Table E1, Criteria SW5 states "Minor roads remain passable in the 5 year ARI storm event" and the manner in which compliance will be achieved states "Pit and pipe network will be designed to convey up to the 5 year ARI event". The DoW's position is that the minor event road safety criterion can be achieved, in conjunction with the 1 year 1 hour ARI event criterion by the use of tree pits, median and/or roadside swales and bio-filters (rain gardens) and overland flow paths are used to manage minor storm events up to 5 year ARI. The DoW recommends that the use of pit and pipe type of conveyance is minimised as this increases the amount of water to be managed in the parks via bio-filters.</li> </ul> | <p>The civil designs will need to meet the civil design criteria from the City of Swan, and we will also comply with DOW published policies. Specifically, the first 15mm of runoff will be retained at source or as close to source as practicable. This may include road reserves (such as the median swales proposed) or bio retention areas located within POS. Note that the project team will be trying to minimise the use of traditional drainage wherever practicable, however we will be required to meet the City's standards for trafficability and civil design. The Executive Summary and Section 6 of the LWMS will be updated to include some commentary regarding road hierarchy, as the approach to managing drainage will vary depending on the road type and context.</p>  | <p>LWMS<br/>Section 7.2 &amp; ES</p> <p>Added sub-section regarding road hierarchy, as the approach to managing drainage will vary depending on the road type and context.</p>   |
| <p>3.</p> <ul style="list-style-type: none"> <li>Criteria GW4 states that subsoil drains from developed residential areas should have a free draining outfall located 150 mm above the invert of Blackadder or Woodbridge Creeks. The criterion should be revised to state that free outfall of subsoil drains should be ensured via outfall inverts being at or above the seasonal maximum winter base flow levels in the Blackadder and Woodbridge Creeks.</li> </ul>  | <p>We anticipate seasonal baseflow to be &lt;150mm in the base of the creeks and therefore we can modify wording on this to provide a greater level of comfort to DOW.</p>   | <p>LWMS<br/>Section 4.3 <b>Criteria GW4</b></p> <ul style="list-style-type: none"> <li>- Amended to read "Outfall inverts to be set at or above seasonal maximum winter base flow levels in Blackadder and Woodbridge Creeks</li> </ul> <p>Section 6.1.1 paragraph 4</p> <ul style="list-style-type: none"> <li>- Updated consistent with the above.</li> </ul> <p>Section 6.3 Table 6</p> <ul style="list-style-type: none"> <li>- Updated consistent with the above.</li> </ul> <p>ES Table E1</p> <p>Updated consistent with the above.</p> |



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| 4. | <ul style="list-style-type: none"> <li>Criteria GW5 states that BRAs and median swales will have invert at least 500 mm above the Blackadder or Woodbridge Creeks. This statement is not clear about the reference levels at the Blackadder and Woodbridge Creeks. The DoW advises that the invert levels of BRAs and median swales should be with reference to the seasonal maximum winter base flow levels in the Blackadder and Woodbridge Creeks.</li> </ul> | As per 3.  | <p>LWMS<br/>Section 4.3 <b>Criteria GW5</b></p> <ul style="list-style-type: none"> <li>Amended to read “BRAs and median swales will have invert above seasonal maximum winter base flow levels in Blackadder and Woodbridge Creeks.”</li> </ul> <p>Section 6.1.1 paragraph 4</p> <ul style="list-style-type: none"> <li>Updated consistent with the above.</li> </ul> <p>Section 6.3 Table 6</p> <ul style="list-style-type: none"> <li>Updated consistent with the above.</li> </ul> <p>ES Table E1<br/>Updated consistent with the above.</p> |
| 5. | <ul style="list-style-type: none"> <li>Criteria SW3 states “Detain flows up to the 100 year ARI storm event within the development boundary to maintain pre-development peak flow rates leaving the site”. The DoW advises to rewrite the criteria as “<i>Detain flows up to the 100 year ARI storm event within the development boundary to prevent downstream peak flood levels increasing</i>”.</li> </ul>  | <p>The intention of the water management approach proposed is to maintain the site hydrology. We have engaged with Water Corporation from the very start on this, and they have advised that they will be assessing our peak flows entering Blackadder Creek and Woodbridge creek where it discharges from our site. We are in receipt of their feedback on the LWMS and have already engaged with them to ensure that the approach proposed will meet their requirements – we will be meeting with them over the coming weeks.</p> <p><i>Recent meetings with Water Corporation has since confirmed the requirement to maintain pre-development peak flows (as opposed to flood levels). As the two Creeks are Water Corporation assets the criteria will remain as “Detain flows up to the 100 year ARI storm event within the development boundary to maintain pre-development peak flow rates leaving the site.” Note however that future detailed designs will also be assessing peak flood levels with the aim of minimising final lot levels.</i></p> | No modification undertaken  |
| 6. | <ul style="list-style-type: none"> <li>As per preliminary comments, in regards to Section 5.1.2 Surface water harvesting, please include the relevant details and approvals required for the LWMS stage in accordance with the <i>Guideline for the approval of non-drinking water systems Western Australia</i> (DoW, 2013).</li> </ul>   | As discussed, Emerge will ensure that an assessment of the approval framework for non-drinking water proposals is adequately covered in the LWMS. We have agreed that given the simple nature of the proposal the information requirements should be able to be met within the LWMS, and should not need stand alone documentation.  | <p>LWMS<br/>Preliminary feasibility for surface water harvesting provided in Section 5.1.2</p>  |
| 7. | <ul style="list-style-type: none"> <li>The DoW advises that an application for a temporary establishment licence for POS irrigation could be considered, but is not guaranteed. The proponent would need to demonstrate an adequate supply for ongoing/permanent irrigation first, such as a suitable trade or approved stormwater harvesting system.</li> </ul>   | Noted. Note also that the assumptions we have used to determine yield volumes are very conservative and the demand would easily be met by the catchment onsite. Note also that we have been seeking a trade partner but response so far have been negative, at times hostile, from existing licence holders.   | No modification undertaken  |

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| 8.  | <ul style="list-style-type: none"> <li>The irrigation strategy in Appendix D just states irrigated areas. Please provide a breakdown of areas of permanent irrigation (i.e. turf) and establishment irrigation (i.e. planted areas) and then give volumes required per park/POS.</li> </ul>   | <p>The irrigated areas are minor (less than 1ha). Landscape concept plans were already included in Appendix D of the LWMS, however where these are updated they will also be included in the updated LWMS.</p>  | <p>LWMS<br/>Appendix D</p> <ul style="list-style-type: none"> <li>Updated landscape irrigation breakdown</li> </ul> <p>Section 5.4</p> <ul style="list-style-type: none"> <li>Add discussion of permanent/establishment irrigated areas</li> </ul> |
| 9.  | <ul style="list-style-type: none"> <li>Given the soil is rich in nutrients (TN and TP), please articulate how the groundwater mobilised by the subsoils will be treated prior to discharge into the receiving environment.</li> </ul>   | <p>Subsoil drains will not be installed below the clay layer (and seasonal perched layer). We will therefore not be draining an aquifer or any nutrients currently resident in groundwater. Subsoils will be used to control post-development rise in groundwater, should this occur. Any water conveyed by the subsoils will be runoff infiltrated onsite, which will be minimal from lots (given the higher densities proposed) or will be discharged via a vegetated median swale or BRA and will therefore be treated.</p>  | <p>No modification undertaken</p>  |
| 10. | <ul style="list-style-type: none"> <li>Please provide pre-development and post-development groundwater levels for the development area north of the railway reserve.</li> </ul>   | <p>Agreed. Additional monitoring to 'top up' the groundwater data that was available at the time of preparation of the LWMS has been undertaken in 2015.</p>  | <p>LWMS<br/>Section 3.6.1<br/>Figure 2 contours updated</p>  |
| 11. | <ul style="list-style-type: none"> <li>The DoW does not support the criteria that the majority of lots will not retain 1 yr 1hr volume (runoff from first 15mm rainfall) due to low permeability of underlying clay layer and will be retained in median swales and bioretention areas. The DoW advises that infiltration for first 15mm, on lot and in road reserves, is feasible, especially if 1.5m of sand fill (hydraulic conductivity of 4m/day) is placed above the natural ground surface and/or proposed subsoil inverts.</li> </ul> | <p>An indicative fill strategy has been included in Appendix E of the LWMS. We note our discussion on legibility of the fill strategy, and would note that the pdf version on the CD provided can be scrutinised in significant detail. The final version of the LWMS will have an A3 version to assist legibility, and we will also include a sample of the detailed earthworks modelling that is being prepared which shows how the clay layer will be shaped and how much fill will subsequently be imported above the clay layer. Note that this will not cover the entire site as the detailed design is still in process, and will be included in the appropriate UWMP which covers the subdivision area/development stage. The final amount of fill proposed will not be available until final detailed designs have been developed.</p> <p><i>See also response to Comment 1.</i></p> | <p>LWMS<br/>Appendix E</p> <ul style="list-style-type: none"> <li>Fill strategy at A3 size</li> </ul>  |
| 12. | <ul style="list-style-type: none"> <li>100 year ARI TWLs in FSA 1 + BRA 1 is 18.5m AHD. Finished lot levels are as low as 17.45m AHD. These lots may therefore be inundated and the LWMS does not meet the requirement of minimum clearance. Please clarify if this is an error.</li> </ul>   | <p>Noted. Note that the LWMS provides bulk earthwork levels, not finished detailed designs. Earthwork levels that will be detailed in the future UWMP will be revised so that appropriate clearance is provided to all BRAs.</p>  | <p>LWMS<br/>Appendix E</p> <ul style="list-style-type: none"> <li>Updated earthworks</li> </ul>  |
| 13. | <ul style="list-style-type: none"> <li>Swales, tree pits and bio-filters (rain gardens) in the road reserves, in medians or along lot frontages, should be more extensive and distributed, especially along the east-west roads. Consideration of adjusting the current draft Structure Plan to accommodate this WSUD principle should be seriously considered as a part of this step in the planning process. This approach will reduce the sizing and requirement for biofilters in the parks and living stream corridors.</li> </ul>       | <p>As discussed, the WSUD approach that we have proposed includes wider road reserves and median swales to cater for minor events. This has been discussed with and in principle agreed to by the City. We have sought to maintain the existing hydrology of the site by locating surface flow pathways generally aligned with existing site flow paths/catchments. Maintenance and City of Swan design standards that we will need to satisfy are our greatest consideration. As discussed in response to point 1, the LWMS will have additional references to other WSUD measures that may be considered for implementation within the UWMP</p>   | <p>See response to comment #1</p>  |

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| 14. | <ul style="list-style-type: none"> <li>For major events (up to 100 yr/1%AEP) the criteria of 'post development flows not exceeding pre development flows' should be replaced with 'downstream flood heights should not be increased' and modelling undertaken to demonstrate this, thus utilising the large culvert capacity under the Roe Hwy already in place courtesy of Main Roads.</li> </ul>                   | As discussed, the WSUD approach that we have proposed includes wider road reserves and median swales to cater for minor events. This has been discussed with and in principle agreed to by the City. We have sought to maintain the existing hydrology of the site by locating surface flow pathways generally aligned with existing site flow paths/catchments. Maintenance and City of Swan design standards that we will need to satisfy are our greatest consideration. As discussed in response to point 1, the LWMS will have additional references to other WSUD measures that may be considered for implementation within the UWMP  | See response to comment #1  |
| 15. | <ul style="list-style-type: none"> <li>A preliminary assessment of the 1yr (bankfull) flows should be undertaken to enable the preliminary sizing of the 'bankfull' channels for the Blackadder and Woodbridge creek lines and their associated 'floodplains', incorporating some bio-filtration areas for those road reserves immediately adjacent to the corridors.</li> </ul>                                     | Noted. This can (and will need to be) undertaken at detailed design stage.  | No change in response to this comment   |
| 16. | <ul style="list-style-type: none"> <li>The current cross-sections in the landscaping report (Appendix D) are not supported by DoW, as they show the channels as elevated above the floodplain areas, which are trying to accommodate the extensive large bio-filtration areas resulting from the current drainage design approach, which appears to be based on a traditional pit/pipe design assumption.</li> </ul> | The sections provided in Appendix D do not show channels elevated above floodplain areas, however the inverts will require refinement at detailed design. The LWMS has been updated to indicate that this aspect will require further investigation and resolution within detailed designs, and that the outcome would be reported in the future UWMP. The landscape cross sections have been updated as per the modelling updates to meet Water Corporation requirements.  | LWMS<br>Appendix D <ul style="list-style-type: none"> <li>Updated landscape cross-sections</li> </ul> Section 8.1 <ul style="list-style-type: none"> <li>Added discussion clarifying future detailed design of channel, basin inverts</li> </ul>  |
| 17. | <ul style="list-style-type: none"> <li>Inverts of Blackadder Creek and proposed Flood Storage Areas (FSAs) are at the same level (14.80m AHD). Due to base flow in the Blackadder Creek, the FSAs will remain inundated. Please clarify this.</li> </ul>   | The design intention was that the floodplain would not receive runoff until it overtops an in-stream control level, which would occur perhaps at > a 2 year ARI event. It is acknowledged that seasonally these flood storage areas will not be high and dry, however the approach mimics the current hydrology of the site. Note that the runoff modelling, including the cross sectional profile of basins and the streamline have been revised in response to Water Corporation feedback. As indicated in response to point 16, the LWMS has had additional wording added that recognises that future detailed design will need to consider the useability and amenity of the flood storage areas. | LWMS<br>Section 8.1 <ul style="list-style-type: none"> <li>Added wording recognising future detailed design will need to consider the useability and amenity of the flood storage areas.</li> </ul>   |
| 18. | <ul style="list-style-type: none"> <li>The DoW advises that the inverts of FSAs should be set above the seasonal maximum winter base flow level of the Blackadder Creek and Woodbridge.</li> </ul>   | Advice noted.   | LWMS<br>Section 4.3 <ul style="list-style-type: none"> <li>Added FSAs to <b>Criteria GW5:</b> FSAs inverts are to be above the seasonal maximum winter base flow level of Blackadder and Woodbridge Creeks.</li> </ul> Section 7.2.2 Paragraph 2 <ul style="list-style-type: none"> <li>Updated consistent with the above.</li> </ul> Table 8 <ul style="list-style-type: none"> <li>Updated inverts</li> </ul> |

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| 19. | <ul style="list-style-type: none"> <li>Amend Figure 2 to show the groundwater depths, direction of flow and quality.</li> </ul>  | The levels and flow directions are self-explanatory based on the values presented in the contours. Note that the nutrient concentrations are provided in Section 3.6.2, which directly references Figure 2.   | No modification undertaken  |
| 20. | <ul style="list-style-type: none"> <li>Figure 6 does not reflect the actual pre-development hydrology. It omits the Blackadder tributary and the culvert under Roe Highway. In addition, the figure should also show the floodways, flood plains, catchments and capacity of surface-water flows and existing drainage infrastructures including analysis of 1 year, 5 year and 100 year ARI pre-development flows.</li> </ul> | Noted. Emerge will add in the culvert beneath Roe Highway and a flow pathway however note there is no streamline or flow pathway in this location, as discussed in our previous meetings. We will be happy to add whatever detail will add value to the figures, however note most of the requested information is already in the LWMS. | LWMS<br>Figure 6<br><ul style="list-style-type: none"> <li>Added Roe Highway culvert and an indication of the mapped location of the (non existent) Blackadder tributary</li> </ul> |
| 21. | <ul style="list-style-type: none"> <li>Amend Figures 7, 8, 9 &amp; 10 to show the surface water management strategy, flow direction and top water level.</li> </ul>  | Note that Figures 8, 9 and 10 are only included to satisfy the event plans requested in BUWM (the value of which we have always queried). If DOW needs further details on these to assist their understanding, we will be happy to do this. We note that the City of Swan did not request such additions to figures.                    | No modification undertaken  |
| 22. | <ul style="list-style-type: none"> <li>Please include the figures illustrating the groundwater management system and figure of the geotechnical plan in the LWMS.</li> </ul>   | While we can provide some conceptual figures showing the groundwater management system, we will not be undertaking detailed designs at LSP stage. Likewise the grading of the clay layer and geotechnical response (fill levels) will not be finalised until detailed design stage.   | LWMS<br>Appendix E<br><ul style="list-style-type: none"> <li>Updated earthworks. Additional indicative fill strategy</li> </ul>   |

#### Department of Water – Additional comment

| Agency Comments |  | Proponent Response  | Document Modifications         |
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| 23.             | 5. and 14. – Please clarify if the wording suggested by the DoW will be adopted. I believe this was agreed to at the meeting.  | This was agreed to, however since this time Water Corporation have confirmed that they require the peak flow rate to be the key guiding criteria. Note that the LWMS now also indicates that assessment of peak flood levels will be undertaken. See also response to comments 5 & 14 | See response to comment 5 & 14 |
| 24.             | 8. – The DoW requests that POS concept landscape plans are provided, as required by the LWMS Guidelines.   | See response to comment 8   | See response to comment 8      |
| 25.             | 11. – Please provide an indicative fill strategy (discussion of fill levels proposed and a figure of indicative fill levels) that indicates the amount of fill proposed (note that Appendix E is too small to be read).  | See response to comment 11  | See response to comment 11     |
| 26.             | Table E 1 Water management criteria and compliance summary<br><ul style="list-style-type: none"> <li>The reduced irrigation figure of 6,750kL/ha/annum needs to be broken down into irrigation requirements for turf and for other vegetation. 6,750kL was calculated as the average of all requirements.</li> </ul> | See response to comment 8   | See response to comment 8      |
| 27.             | Table E 1 Water management criteria and compliance summary<br><ul style="list-style-type: none"> <li>500mm above the Maximum Groundwater Level (MGL) - Where has this requirement come from?</li> </ul>  | This has been developed based on clearance of at-lot soakage structures (being used in a portion of the site which is not low lying) for installation of soakwells (where appropriate)  | No modification undertaken     |

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| 28. | Table E 1 Water management criteria and compliance summary<br>• Inverts 500mm above Blackadder and Woodbridge Creeks - Please provide an explanation of why 500mm is required. The DoW will accept lower inverts.  | Noted. Management criteria has been revised to 300mm above 100 year ARI flood levels  | LWMS<br>Management criteria has been revised to 300mm above 100 year ARI flood levels   |
| 29. | Table E 1 Water management criteria and compliance summary<br>• GW3, GW5 & SW6 are confusing. Please clarify which criteria are required on which part of the site.  | All criteria are relevant to the entire site, where such measures are implemented.  | No modification undertaken  |
| 30. | 5.1.2 Surface water harvesting<br>• In accordance with the DoW's Guideline for the approval of non-drinking water systems Western Australia (DoW, 2013), the non-drinking water proposal needs to be submitted to the department and other relevant agencies. The report should have a level of detail required at LWMS stage, as dictated by the guideline. However, as discussed at our meeting please consider the information requirements in the Non-drinking water process and consider providing this information within the LWMS rather than following the separate process. | See response to comment 6   | See response to comment 6   |
| 31. | 5.1.2 Surface water harvesting<br>• Consideration needs to be given to the effect surface water harvesting may have on predevelopment flows, the environment, and downstream users.  | Surface water harvesting of water that has infiltrated into the shallow soil profile beneath BRAs will not have any impact on the event based flow rates calculated for the site. The proposed harvesting volume would mostly be harvested during winter months (when there is excess water) and stored for use in summer months, and would therefore have little to no effect on the environment or downstream users (we are not aware of any abstraction of water from Blackadder Creeks downstream). Further, the evapotranspiration losses currently experienced at the site will be approximated by the surface water harvesting proposed. | LWMS<br>Section 5.1.2 has had additional text added which discusses potential impacts on predevelopment peak flows, the environment and downstream users.                                 |
| 32. | 6.1.2 Imported fill and earthworks<br>• Please specify where the criteria of 1.2m above MGL has come from.   | This is not proposed as a criteria.   | LWMS<br>Section 6.1.2 has been modified such that the final text indicates the need for separation between the base of infiltration structures and either the clay layer or MGL of 500mm. |
| 33. | 7.1.1 Lot scale stormwater management<br>• Please provide a figure showing where soakwells can be placed on the site.  | This will be determined at detailed design, however nominally it has been assumed that the area north of the railway and the southern third of the site will utilise soakwells as these parts of the site are not as low lying as the remainder.  | LWMS<br>Section 7 contains a description of those lots where at-lot retention is anticipated to be possible.  |
| 34. | How is it proposed to manage lot runoff where soak wells can't be placed? DoW does not generally support lot connections.  | Noted. See response to 1. Note also that we have not assumed formal engineered 'connections' from lots that do not have onsite soakage, rather we have accounted for the runoff within a downstream treatment area. The manner in which runoff leaves the lot and enters the road drainage system is yet to be finalised.   | See response to 1.  |
| 35. | 7.1.5 Flood storage areas<br>• What is the difference between flood storage area 1 and the other flood storage areas?  | Flood storage area 1 has higher permeability of underlying sands, and does not have the ability to outlet. Therefore the flood storage area needs to be designed for full retention of the 100 year ARI event.  | No modification undertaken  |



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| 36. | This FSA is described as a fenced sump. The DoW does not support fenced sumps.   | The revised surface runoff modelling assumes that the flood storage area will have a maximum depth of 1.2m and 1:6 side slopes and will therefore not require fencing.   | LWMS<br>Section 7.1.7 will be updated with the design details now proposed.  |
| 37. | 7.1.6 Living stream conveyance<br>• A bed and banks permit will be required for the works to be carried out on Woodbridge Creek and Blackadder Creek.  | Noted  | LWMS<br>Section 7.1.8 Paragraph 1 updated to refer to permit requirements  |
| 38. | 7.2.2 Major event runoff management<br>• Please provide justification for FSA1 retaining 100 year flood events.  | The design is consistent with the pre-development hydrology, is reflective of the highly permeable sands underlying this part of the site and the fact that there is no potential outlet for this FSA i.e. it is land locked by the existing railway and the future MRWA road reserve. | No modification undertaken   |
| 39. | 8. Subdivision and Urban Water Management Plans<br>• Woodbridge Creek needs to be included for further clarification at UWMP stage.  | Noted.   | LWMS<br>No changes are proposed to be made to the existing Woodbridge creek channel configuration. Section 8.1 updated to include Woodbridge Creek |
| 40. | • Stormwater detailed designs need to be included at UWMP stage.   | Noted. This has already been stated in Section 8.1   | No modification undertaken   |
| 41. | • It is understood that Black Creek will be re-aligned from its current path. While the DoW does not object to this re-alignment justification is required.  | Justification is provided in 3.5.1.  | No modification undertaken   |
| 42. | • Pre-development monitoring. The DoW does not consider further groundwater monitoring required given the sites soil types and perched groundwater system. However, additional surface water monitoring of both Creeks should be undertaken before the UWMP and subdivision stage. | Noted. Additional monitoring has been conducted during late 2015 to ensure that the groundwater and surface water data available is as up to date as possible.   | LWMS<br>Additional water quality monitoring has been included in the revised LWMS in Section 3.5 and 3.6 and relevant figures                      |

## Water Corporation

| Agency Comments |   | Proponent Response  | Document Modifications  |
|-----------------|---|---|---|
| 1.              | Heritage. Concern was raised about drainage infrastructure being included within the 60m wide corridor provided for Woodbridge and Blackadder Creeks  | WCorp and City of Swan concern in this regard is noted. A Section 18 approval has been provided by the Minister for Indigenous Affairs for the development – see attached. The S18 allows “all things associated with the development of a residential subdivision”. The consultations with the informants onsite specifically raised the shifting of the alignment of Blackadder Creek, and the incorporation of drainage features into the streamline corridor to create a living stream. The proponent will comply with all requirements of the S18 approval.  | No modification undertaken  |
| 2.              | Catchment boundaries to Woodbridge Creek. Concern was raise regarding changes proposed to runoff catchment which diverted more runoff to Woodbridge Creek. WCorp wanted to see catchment mimic existing, which would minimise the amount of flood storage required in the Woodbridge Creek corridor | The earthworks strategy has been revised such that the catchments to Woodbridge Creek now closely mirror the predevelopment environment, and on the northern side is limited to the immediately adjacent road only. This results in there being no requirement for flood detention in the Woodbridge Creek corridor. In order to address runoff treatment, the road along the northern side of Woodbridge (which is now the only catchment on the north) has been widened to 18m and treatment will occur within a roadside swale located in road reserve. Predevelopment and post development catchments are shown in the attached figure and working drawing (respectively)   | LWMS<br>Appendix E<br>Updated earthworks. Additional<br>indicative fill strategy<br>Updated catchment plan/LSP (Figure 7) |
| 3.              | Catchment boundaries to the Bush Forever site wetland. For reference, we note that this wetland is listed as a Multiple Use Wetland. WCorp was of the opinion that the catchment for this wetland was between the railway and Farral Road and extended all the way north to Blackadder Creek.       | The project team have considered the site characteristics and the area suggested as being catchment for the BF site. This portion of the site is sandy, and 2D modelling undertaken using LiDAR data to create a DEM (see screen shot below) confirms that there is some measure of localised ponding that may recharge the wetland, but that it does not extend as far north as Blackadder Creek. The post development catchments have been revised so that there is localised infiltration that seeks to maintain the predevelopment catchment to the BF site. We also note that geological investigations indicate that this area is an area of ‘upwelling’, and groundwater expresses close to the surface which would assist in maintaining the wetland.   | LWMS<br>Updated catchment plan<br>Added minor event drainage adjacent BF.   |
| 4.              | Peak flow rates shown in the pre and post development modelling. WCorp indicated that while the peak flow rates calculated by the project team did not need to exactly match WCorp modelling exactly, they needed to be much closer than proposed. No firm value for variance was provided.         | In consideration of WCorp comments, Emerge have revised the assumptions for the site. The 2D modelling undertaken showed significant ponding along the western boundary at the discharge point for Blackadder Creek. We have represented this in the 1D post-development model as storage nodes, the sizing of which is informed by the flooded area and flooded depth in the 2D model. The resulting predevelopment peak flow rate (from Blackadder and its tributary) is 2.76m <sup>3</sup> /s as compared to the Water Corporation’s modelled 2.49m <sup>3</sup> /s. The post-development modelling has then assumed that the existing storage area in the Western Power easement would be retained as ‘natural storage’. The portions of the existing storage that would be developed under the Structure Plan will be replaced by detention storage located within the Structure Plan area. This will be a combination of online storage (achieved by throttling flows with Blackadder Creek in major events) and detention areas located in POS within the site. Localised treatment areas that will be located within median swales and bio-retention areas within POS will also assist in controlling major event peak flow rates. The resulting post development peak flow rates in Blackadder (and its tributary) is 2.63m <sup>3</sup> /s. | LWMS<br>Section 3.5.3<br>Appendix C – Modelling Assumptions<br>Report   |

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| 5. | Site runoff/catchment assumptions used in modelling. | Our previous modelling has used the Laurensens method, we have selected the Runoff method, and have used the initial and proportional loss parameters below.<br>Pre Development infiltration Parameters |                   |                        | LWMS<br>Appendix C – Modelling Assumptions<br>Report |
|    |  | Catchment Description   | Initial Loss (mm) | Proportional Loss (mm) |  |
|    |  | Ct 1 (Internal – Wood bridge)   | 9                 | 0.2                    |  |
|    |  | Ct 2 ( Internal – Blackadder BD)  | 9                 | 0.5                    |  |
|    |  | Ct 3 ( Internal – Blackadder MD)  | 9                 | 0.4                    |  |
|    |  | Ct 4 ( External –Woodbridge)  | 17                | 0.265                  |  |
|    |  | Ct 5 ( External – Blackadder MD)  | 17                | 0.47                   |  |

Department of Parks and Wildlife

| Agency Comments |  | Proponent Response  | Document Modifications   |
|-----------------|--|---|--|
| 1.              | 4a. The LWMS relies heavily on downstream biofiltration areas located within the Blackadder and Woodbridge Creek foreshore areas to manage 1-year average recurrence interval (ARI) events. In accordance with the Decision Process for Stormwater Management in WA (DoW, 2009), stormwater runoff from constructed impervious services generated by up to the 1-year, 1-hour ARI events on-site, as high in the catchment and as close to the source as possible. While Rivers and Estuaries acknowledges that the clayey soils across much of the site limit the potential for infiltration, further consideration should be given to detaining the 1-year ARI events in lots, lot frontages, medians and road reserves throughout the site.   | See response to DoW comment 1. Those portions of the site where it is appropriate for lots to manage small event drainage will do so. Further, roadside and median swales are proposed high in the catchment where possible via use of wider road reserves. This achieves the requirement for at-source retention and treatment.  | See response to DoW comment 1.   |
| 2.              | 4b. The proposal to discharge water directly from subsoil drains to the creeks is not supported and is inconsistent with Better Urban Water Management (WAPC, 2008), which requires treatment of subsoil drainage water prior to discharge to the surface water system. The rationale provided – that the water will all be clean, infiltrated stormwater and will not include groundwater, which is known to contain high levels of nutrients – has not been adequately supported with information about the level of the controlled groundwater level with respect to the clay layer, the consistency of the clay layer across the site and the depth of the groundwater samples that showed high levels of nutrients. Treatment of the subsoil drainage water prior to discharge to the creeks is therefore recommended.  | Subsoil drainage will not be set at a level which intersects legacy nutrients i.e. it will be set at or above the graded clay layer. Legacy nutrients will therefore not be mobilised. Further, pre-treatment of the subsoil drains can be achieved where localised monitoring suggests it may be required. This can be done by setting the subsoil pipes in a trench backfilled with material capable of removing nutrients before it enters the subsoil pipes. Note that the grading of the clay layer and geotechnical response (fill levels) will not be finalised until detailed design stage.   | LWMS<br>Section 6.1.1 has been updated to indicate that in addition to subsoil drains being set at or above the clay layer (and therefore not intersecting legacy nutrients) collected water could be pre-treated by using a suitable soil media around the drains as required is indicated by predevelopment groundwater nutrient concentrations. |
| 3.              | 4c. Both surface water and groundwater quality data is outdated and updated data should be included, if not in the LWMS, then in future Urban Water Management Plans. The LWMS should be updated to report the sample/bore screening depth (for groundwater) and data should be presented with the minimum, maximum, median, 85%, with a full set of data as an appendix.  | Additional data has been collected in late 2015, capturing the 2015 winter peak. Results obtained from ongoing water quality monitoring have been added to the LWMS and will be provided in future UWMPs. As stated in Section 9.3.1 "These [trigger] values should be reviewed for each UWMP to include additional data gained from any continued monitoring."   | LWMS<br>Results obtained in 2015 have been added to Section 3.<br>Section 9.3.1 has been updated to confirm that these trigger values should be reviewed.  |
| 4.              | 4d. The proposed post-development trigger values for nutrient concentrations in surface water are not appropriate (they are 4 and 8 times the long-term nutrient targets for the protection of ecological health in the Swan Canning river system – 1.0mg/L TN and 0.1 mg/L TP). Long term nutrient reporting (both 5-year reports and annual reports) for the Blackadder Creek sub-catchment is available at <a href="http://www.swanrivertrust.wa.gov.au/the-river-system/evaluation-and-reporting/catchment-water-quality-monitoring-and-reporting/annual-sub-catchment-nutrient-reports">http://www.swanrivertrust.wa.gov.au/the-river-system/evaluation-and-reporting/catchment-water-quality-monitoring-and-reporting/annual-sub-catchment-nutrient-reports</a> - the background water quality of the site and the target nutrient criteria should be discussed and established in this context. | <p>The surface water quality data indicate the nutrient sources within Blackadder Creek are upstream of the site. The LWMS does not propose to manage upstream nutrient sources. Therefore trigger values should be based upon upstream water quality data (SW1).</p> <p>The surface water quality data indicate the site contributes some nutrients to the Woodbridge Creek. This is likely due to the existing industrial and peri-urban land-uses adjacent to the Creek. Development of the site for urban residential purposes is likely to reduce this nutrient input. As above, The LWMS does not propose to manage upstream nutrient sources. Therefore trigger values should be based upon upstream water quality data (SW3).</p> | LWMS<br>Surface water quality triggers have been revised and separated for each Creek to more accurately reflect the upstream nutrient levels.   |

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| 5. | The LSP should be updated to clearly indicate in a plan the location of the Blackadder Creek tributary that has been mapped by DoW as 'water course – minor, perennial' and identify the reasons that this previously identified tributary will not be retained.                | This has been identified and articulated within Section 2.5.2 of the EAMS and within the supporting Biophysical Assessment. Figure 11 of the EAMS clearly identifies the Blackadder Creek tributary in its predevelopment location. | No modification undertaken  |
| 6. | The LSP should be updated to indicate both Blackadder and Woodbridge Creeks will be rehabilitated and revegetated with suitable endemic species. The plan currently indicates that Woodbridge Creek will be revegetated, but the intention with Blackadder Creek is less clear. | Noted. The creation of a Living Stream through the realignment of Blackadder Creek will involve revegetation works to re-establish the ecological values of the waterway.   | EAMS<br>References to revegetation works throughout the EAMS have been amended to provide further clarity surrounding the proposed rehabilitation works associated with both waterways. |



# Attachment 8

Local Structure Plan Landscape Masterplan (LD Total 2015)









Figure 3. Illustrative Landscape Master Plan



