3.2 Fauna

3.2.1 Significant fauna species

One fauna species of national significance, Golden Sun Moth *Synemon plana*, was recorded within the project area during targeted surveys. Golden Sun Moth were sighted in a number of patches of grassland within the project area during targeted surveys undertaken in the 2013/2014 survey season (Figure 3). One additional species, Growling Grass Frog, was recorded less than 3 km downstream of the project area during targeted surveys for the broader Green Fields Station assessment in 2013 and is considered highly likely to make use of the unnamed tributary and adjacent terrestrial habitat along the north-eastern boundary of the current project area.

No species of state significance were recorded within the project area during targeted surveys, however a number of state significant fauna species and near-threatened or data-deficient species have been recorded within the broader Green Fields Station project area (Appendix 2).

The general habitat requirements of all state and nationally significant species that have been recorded or are predicted to occur within 5 km of the project area are discussed in Appendix 2: Fauna.

DEPI's habitat importance models for the project area show modelled habitat for 18 species listed in Table 4. The areas of modelled habitat are shown in Figure 4.

Table 4: Summary of rare or threatened fauna species' habitats modelled in the project area under DEPI's Habitat Importance Models.

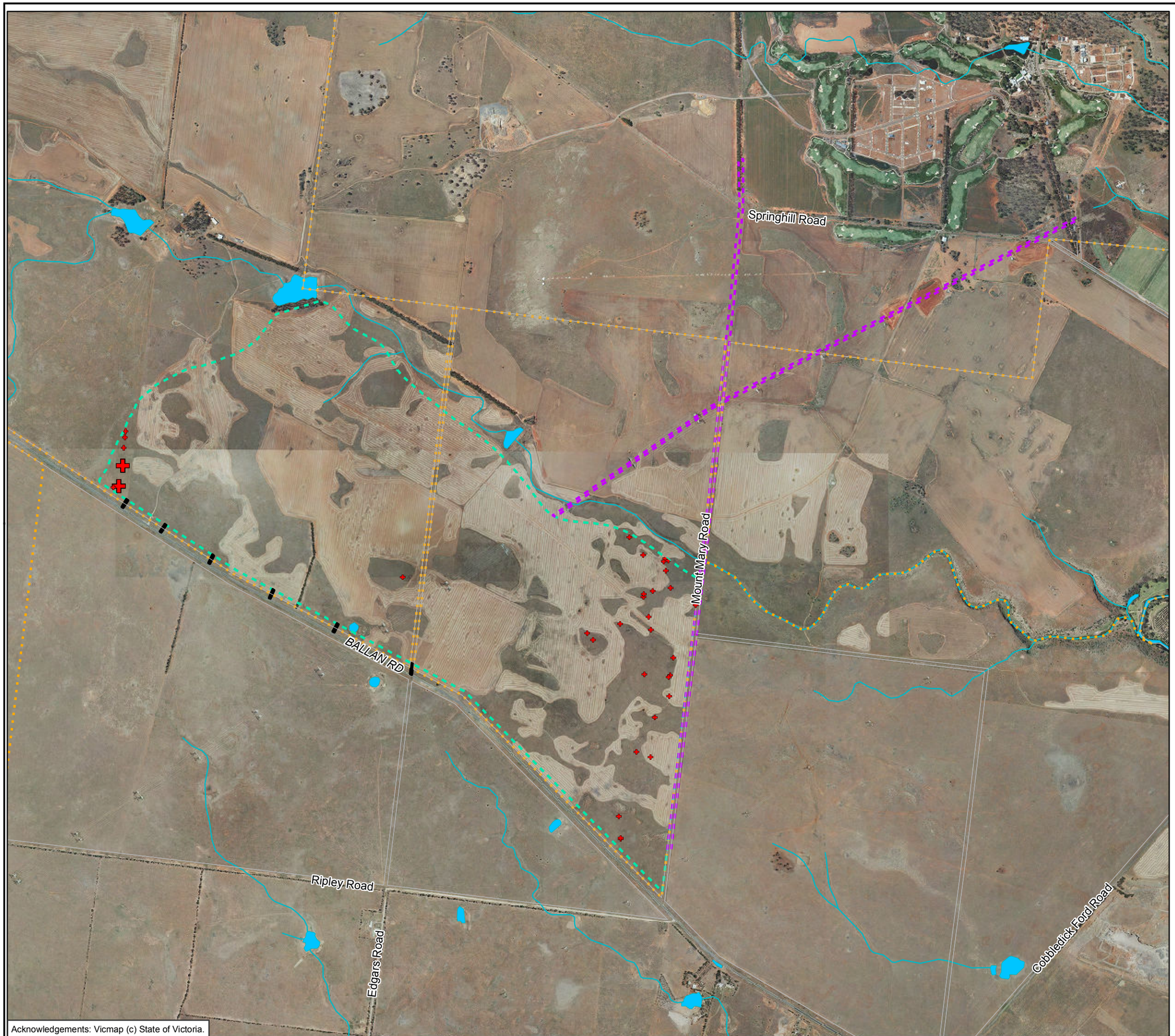
Common name	Species name	Typical habitat
Australasian Bittern	*Botaurus poiciloptilus*	wetlands
Australasian Shoveler	*Anas rhynchotis*	wetlands
Australian Painted Snipe	*Rostratula australis*	wetlands, lignum swamp
Baillon's Crake	*Porzana pusilla palustris*	wetlands
Black Falcon	*Falco subniger*	grassland
Brolga	*Grus rubicunda*	wetlands, grassland
Brown Toadlet	*Pseudophryne bibronii*	woodland, wetlands
Bush Stone-curlew	*Burhinus grallarius*	woodland
Golden Sun Moth	*Synemon plana*	grassland
Grey Goshawk	*Accipiter novaehollandiae*	woodland, forest
Growling Grass Frog	*Litoria raniformis*	wetland
Hardhead	*Aythya australis*	wetland
Lace Monitor	*Varanus varius*	woodland
Little Bittern	*Ixobrychus minutus dubius*	wetland
Painted Honeyeater	*Grantiella picta*	woodland
Red-chested Button-quail	*Turnix pyrrhothorax*	grassland
Square-tailed Kite	*Lophoictinia isura*	woodland

Common name	Species name	Typical habitat
Striped Legless Lizard	*Delma impar*	grassland

3.3 Further survey recommendations

General flora surveys have mapped and quantified the extent of native vegetation within the proposed project area. All areas identified as potential habitat for threatened species have been surveyed in detail for threatened flora and fauna, with the exception of Ballan Road which has had only a general inspection.

Prior to development occurring within the Ballan Road reserve a more detailed survey or micro-siting exercise for the placement of access cross-overs would be required to ensure that the development does not impact on EPBC Act listed species.



Legend

- Green Fields Station
- Hydroponics project area
- Hydroponics area
- Ballan Road Access
- Service corridors
- Cadastre
- Golden Sun Moth (Males) with counts
  - 0 - 3
  - 8 - 12

NB: For clarity only fauna values within the impact area are displayed in the map. Fauna values exist outside of the displayed project area

Figure 3: Fauna values within the study area

0 220 440 660 880 1,100

Metres
Scale: 1:20,000 @ A3
Coordinate System: GDA 1994 MGA Zone 55

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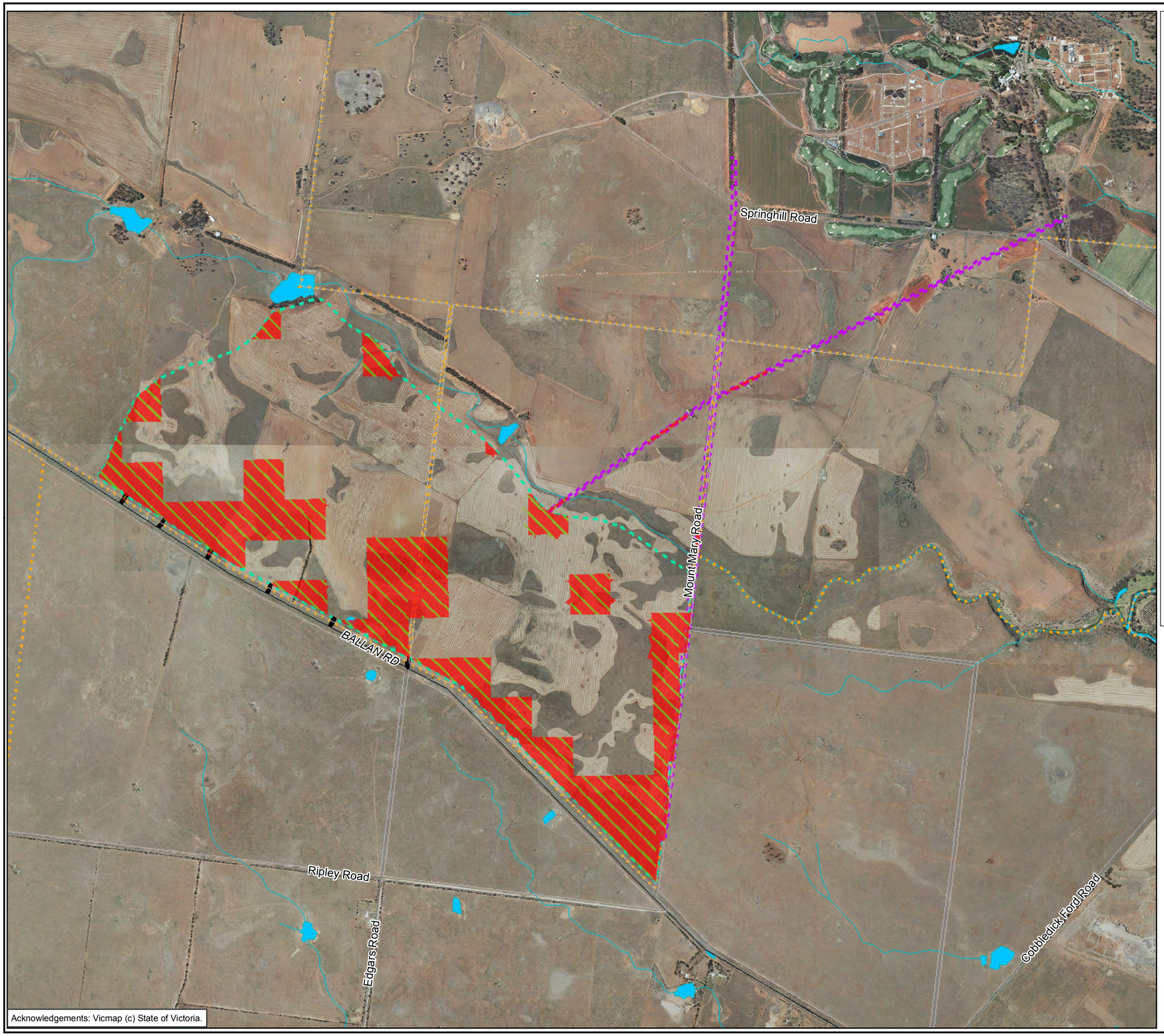
N

Matter: 16089,
Date: 21 May 2014,
Checked by: RDS, Drawn by: JMS, Last edited by: jshepherd
Location:P:\16000s\16089 Eynesbury Re-referral T+C\Mapping\16089_F3_PermitArea(fauna)_20140521



Legend

Green Fields Station

Hydroponics project area

Hydroponics area

Ballan Road Access

Service corridors

Cadastre

Habitat importance models

Fauna

Flora

Fauna species

- Australasian Bittern
- Australasian Shoveler
- Australian Painted Snipe
- Baillon's Crake
- Black Falcon
- Brolga
- Brown Toadlet
- Bush Stone-curlew
- Golden Sun Moth
- Grey Goshawk
- Growling Grass Frog
- Hardhead
- Lace Monitor
- Little Bittern
- Painted Honeyeater
- Red-chested Button-quail
- Square-tailed Kite
- Striped Legless Lizard

Flora species

- Austral Crane's-bill
- Buloke Mistletoe
- Clover Glycine
- Heath Spear-grass
- Large-headed Fireweed
- Matted Flax-lily
- Pale Swamp Everlasting
- Purple Blown-grass
- Rosemary Grevillea
- Rye Beetle-grass
- Small Milkwort
- Small Scurf-pea
- Snowy Mint-bush
- Spiny Rice-flower
- Swamp Sheoak
- Tough Scurf-pea

Figure 4: DEPI Habitat importance models for the Hydroponics Project Area

0 220 440 660 880 1,100

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Matter: 16089,
Date: 21 May 2014,
Checked by: RDS, Drawn by: JMS, Last edited by: jshepherd
Location:P:\16000s\16089 Eynesbury Re-referral T+C\Mapping\16089_F4_DEPIHab_Import_20140521

Springhill Road

BALLAN RD

School Road

Bluegum Track

Agars Road

Ripley Road

Ripley Road

Ripley Road

Moretons Road

Acknowledgements: Vicmap (c) State of Victoria.

Legend

Green Fields Station

Cadastre

Potential Offset Area

Habitat importance models

Fauna

Flora

Fauna species

- Black Falcon
- Chestnut-rumped Heathwren
- Golden Sun Moth
- Lace Monitor
- Painted Honeyeater
- Red-chested Button-quail
- Striped Legless Lizard

Flora species

- Austral Crane's-bill
- Clover Glycine
- Fragrant Saltbush
- Giant Honey-myrtle
- Pale Swamp Everlasting
- Small Milkwort
- Snowy Mint-bush
- Spiny Rice-flower
- Sticky Wattle

Figure 5: DEPI Habitat importance models for the potential offset area

0 220 440 660 880 1,100

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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Matter: 16089,
Date: 21 May 2014,
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Location:P:\16000s\16089 Eynesbury Re-referral T+C\Mapping\16089_F5_DEPIHab_Import_Offset_20140521

4. Biodiversity legislation and government policy

This section provides an assessment of the project in relation to key biodiversity legislation and government policy. Where available, links to further information are provided. This section does not describe the legislation and policy in detail and guidance provided here does not constitute legal advice.

4.1 Commonwealth

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (NES) protected under the Act.

Link for further information including a guide to the referral process is available at: http://www.environment.gov.au/epbc/index.html

There are three matters of national significance that may be of relevance to any development of land within the project area:

- listed threatened species and ecological communities
- listed migratory species
- wetlands of international importance (Ramsar sites).

These are summarised below.

Listed threatened species and/or ecological communities

Listed ecological communities: One listed community occurs within the project area:

- Natural Temperate Grassland of the Victorian Volcanic Plain

Listed flora species: Flora species listed under the Act are discussed in Section 3.1.2 and tabled in Appendix 1: Flora Table A1.2. One listed plant species, Spiny Rice-flower, was recorded from the project area. An additional six listed plant species (Curly Sedge, Small Golden Moths, Clover Glycine, Maroon Leek-orchid, Button Wrinklewort and Large-headed Fireweed) are predicted to occur in the project area. There is at least a medium likelihood of occurrence for one these species, Large-fruit Fireweed, to occur. This species can become more prevalent following disturbance and may be present on the site in very low numbers that may expand in the future.

Listed fauna species: Fauna species listed under the Act are discussed in Section 3.2.1 and listed in Appendix 2: Fauna In summary, 15 listed fauna species have been recorded or are predicted to occur within 5 km of the project area. Of these, five are considered to have at least a medium likelihood of occurrence within the project area. Targeted survey has been undertaken within the project area for three listed fauna species, including:

- Golden Sun Moth
- Plains-wanderer
- Striped Legless Lizard

The results of these surveys are discussed in Section 3.2.1. In summary, one listed species, Golden Sun Moth, was recorded in the project area during the current assessment. One additional species, Growling Grass

Frog, was recorded less than 3 km downstream of the project area during targeted surveys for the broader Green Fields Station assessment in 2013 and is considered highly likely to make use of the unnamed tributary and adjacent terrestrial habitat along the north-eastern boundary of the current project area.

Listed migratory species

The list of migratory species under the EPBC Act is a compilation of species listed under four international conventions: China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA), Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Species listed under the 'migratory' provisions of the EPBC Act are listed in Appendix 2: Fauna

While some of these species would be expected to use the project area on occasions, and some of them may do so regularly or may be resident, it does not provide important habitat for an ecologically significant proportion of any of these species.

Wetlands of International Importance (Ramsar sites)

The project area is identified by the DoE database as being within the catchment of a Wetland of International Significance (Ramsar site): Port Phillip Bay (western shoreline) and Bellarine Peninsula. Most of the project area drains to the Werribee River and the remainder drains to Lollypop Creek. Both of these waterways drain to and actually become part of the Port Phillip Bay (western shoreline) and Bellarine Peninsula Ramsar Site approximately 21 km downstream of the project area. Impacts to water quality and quantity are essentially the only means by which impacts to the Ramsar site could eventuate. A range of mitigation measures aimed at avoiding or minimising impacts to water quality and hydrological alterations are outlined within this report. Provided these mitigation measures are appropriately adhered to, the development of the project area is not likely to result in a significant impact to a Ramsar wetland.

Implications for the proposed project area

A referral to the Australian Government will be required for any development activity in the project area that impacts on matters of national environmental significance. This is relevant for any proposed removal of grassland or changes in land use that are likely to cause significant impacts on listed threatened species and ecological communities. Any proposed development should respond to EPBC policy guidelines relating to matters occurring within the project area.

4.2 State

4.2.1 Flora and Fauna Guarantee Act 1988 (FFG Act)

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. Under the FFG Act a permit is required from DSE to 'take' protected flora species from public land. A permit is generally not required for removal of protected flora from private land. Authorisation under the FFG Act is required to collect, kill, injure or disturb listed fish.

Link for further information: http://www.dse.vic.gov.au/plants-and-animals/native-plants-and-animals/threatened-species-and-communities/flora-and-fauna-guarantee-act

Two threatened communities, Western (Basalt) Plains Grassland Community, and Grey Box-Buloke Grassy Woodland Community are present within the project area. These communities are mapped as *Low-rainfall* Plains Grassland (EVC 132_63) and Plains Woodland (EVC 803) in Figure 2.

Listed threatened and protected species recorded during the current assessment and predicted to occur within 5km of the project area are identified in Appendix 1: Flora and Appendix 2: Fauna.

Implications for the proposed project area

The majority of the project area is privately owned and is not declared 'critical habitat'. Therefore a permit to 'take' listed flora and fauna species is not required under the FFG Act. However, the presence of listed threatened communities and flora and habitat for listed threatened fauna may be considered by the regulatory authorities in determining the response to an EES referral or application for native vegetation removal under Clause 52.17 of the planning scheme (see below). In all areas of public land, such as Ballan Road reserve and Mt Mary Road reserve, a permit will be required to take listed species. Within Ballan Road and Mt Mary Road reserves indigenous grasses are considered a component of a listed community (Western (Basalt) Plains Grassland) and other common listed species such as members of the Asteraceae family are present. A permit to 'take' threatened flora would be required for development in these areas.

Future planning for the project area should have regard for the relevant threatening processes and the Action Statements prepared under the FFG Act for the following listed species and communities:

- Plains-wanderer
- Brolga
- Australian Painted Snipe
- Swift Parrot
- Striped Legless Lizard
- Golden Sun Moth
- Grassland Earless Dragon
- Growling Grass Frog
- Yarra Pygmy Perch
- Large-fruit Fireweed
- Spiny Rice-flower
- Maroon Leek-orchid
- Brittle Greenhood
- Button Wrinklewort
- Small Scurf-pea
- Western (Basalt) Plains grassland.

4.2.2 Catchment and Land Protection Act 1994 (CaLP Act)

The CaLP Act identifies and classifies certain species as noxious weeds or pest animals, and provides a system of controls on noxious species.

Declared noxious weeds identified in the project area are listed in Appendix 1: Flora and established pest animals are listed in Appendix 2: Fauna.

Implications for the proposed project area

The proponent/land owner must take all reasonable steps to eradicate regionally prohibited weeds, prevent the growth and spread of regionally controlled weeds, and prevent the spread of and as far as possible eradicate established pest animals. The State is responsible for eradicating State prohibited weeds from all land in Victoria.

Link for further information: http://www.dpi.vic.gov.au/agriculture/pests-diseases-and-weeds/protecting-victoria-pest-animals-weeds/legislation,-policy-and-permits/legislation

4.2.3 Planning and Environment Act 1987 (incl. Planning Schemes)

The *Planning and Environment Act 1987* controls the planning and development of land in Victoria, and provides for the development of planning schemes for all municipalities.

Reforms to the native vegetation permitted clearing regulations were gazetted on 20 December 2013 through planning scheme amendment VC105. The reforms made changes to the Victoria Planning Provisions including the State Planning Policy Framework (SPPF), Clause 52.16 and 52.17 of all planning scheme within Victoria and introduced the Permitted clearing of native vegetation: Biodiversity Assessment Guidelines (the Guidelines, DEPI 2013.

Of particular relevance to the development proposal are controls relating to the removal, destruction or lopping of native vegetation contained within the Wyndham Planning Scheme (the Scheme), including permit requirements. The Scheme (Clause 72) defines 'native vegetation' as 'Plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'. It is an objective of Clause 12.01-2 of the SPPF (Native Vegetation Management) that permitted clearing of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity. For more information on these reforms refer to www.depi.vic.gov.au/nativevegetation.

Clause 52.17 (Native Vegetation) requires a planning permit to remove, destroy or lop native vegetation including some dead native vegetation. Decision guidelines are contained in Clause 52.17-5. Clause 52.17 does not apply if a Native Vegetation Precinct Plan corresponding to the land is incorporated in the Scheme. It should be noted that where native vegetation does not meet the definition of a remnant patch or scattered trees, as described in Section Section 2.5.1 , the Guidelines do not apply. However, a permit may still be required to remove, destroy or lop native vegetation under the provisions of the Scheme.

Under Clause 66.02 a permit application to remove, destroy or lop native vegetation is required to be referred to DEPI as a recommending referral authority if any of the following apply:

- the area of native vegetation to be removed is greater than 0.5 hectares
- the class of application is on the high risk-based pathway
- a property vegetation precinct plan applies to the site or
- the native vegetation is on Crown land occupied or managed by the Responsible Authority.

The need for a permit to remove native vegetation may also be triggered by two overlays within the Scheme. The location of the overlays in relation to the project area can be determined via the following link: http://planningschemes.dpcd.vic.gov.au/index.html. The provisions of the following overlays apply to the project area:

Schedule 1 to the Environmental Significance Overlay (ESO1) – This overlay is only relevant to a small area at the northern end of the project area and will be impacted by the northern part of the services alignment. This schedule to the ESO aims to protect waterways in the Wyndham area.

Schedule 5 to the Environmental Significance Overlay (ESO5) – This overlay applies to much of the project area. This schedule to the overlay exists to protect the grasslands within the Werribee Plains Hinterland.

Implications for the proposed project area

The hydroponics project will require a planning permit for the removal of native vegetation. A planning permit application will be referred to DEPI as a recommending referral authority.

Victoria's Biodiversity Assessment Guidelines

The Guidelines are incorporated into the Victoria Planning Provisions and all planning schemes in Victoria (DEPI 2013a). The Guidelines replace Victoria's Native Vegetation Management – A Framework for Action. It should be noted that assessment against the Guidelines has not been undertaken in detail for this project as the project is currently being referred to Minister for Planning for an Environment Effects Statement determination. The existing EES referral criteria and guidance reference the previous native vegetation policy (the Framework).

The purpose of the new Guidelines is to guide how impacts to biodiversity should be considered when assessing a permit application to remove, destroy or lop native vegetation. The objective for permitted clearing of native vegetation in Victoria is 'No net loss in the contribution made by native vegetation to Victoria's biodiversity'.

A summary of the implications for the project under the Guidelines is provided in Section 5 of this report. . Under the Guidelines, there are three risk-based pathways for assessing an application for a permit to remove native vegetation: low, moderate and high.

A determination of the risk-based pathway for any future planning permit application relevant to the project is provided in Section 5.3. In summary, a planning application for removal of native vegetation is likely to be assessed under the high risk-based pathway.

4.2.4 Wildlife Act 1975 and associated Regulations

The *Wildlife Act 1975* is the primary legislation in Victoria providing for protection and management of wildlife.

The Wildlife Regulations 2002 of the Act prescribe penalties for certain activities relevant to wildlife including disturbance of habitat without appropriate authorisation (Section 9).

Implications for the proposed project area

A permit is required to remove native vegetation at the site. If permission for removal of vegetation is granted under provisions of other Victorian legislation a separate permit under the *Wildlife Act 1975* is not required for removal of vegetation that constitutes habitat for fauna. However, there are areas of vegetation within the project area that, while not native vegetation, are habitat for threatened fauna listed under the Act. Removal of this habitat may require a permit under the *Wildlife Act 1975*. If construction activities are likely to result in the death of wildlife or the need to remove it, a permit will be required.

4.2.5 Environmental Effects Act

The *Environment Effects Act* 1978 establishes a process to assess the environmental impacts of a project. If applicable, the Act requires that an Environment Effects Statement (EES) be prepared by the proponent. The EES is submitted to the Minister for Planning and enables them to assess the potential environmental effects of the proposed development.

The general objective of the assessment process is *to provide for the transparent, integrated and timely assessment of the environmental effects of projects capable of having a significant effect on the environment* (DSE 2006).

The 'Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978*' (DSE 2006a) provide a range of criteria that can be used to determine whether an EES may be required for a project. These criteria relate to individual potential environmental effects and a combination of (two or more) potential environmental effects.

An assessment of the project against the individual potential effects criteria has been undertaken. The clearing of greater than 10 ha of native vegetation from an endangered EVC has been identified as a potentially state significant environmental effect. On this basis, a referral is being made to the Minister for Planning for an EES determination.

4.2.6 Water Act 1989

The primary purpose of this Act is to provide a framework for the allocation and management of surface water and groundwater throughout Victoria. It provides a principal mechanism for maintenance of ecosystem functions including those of aquatic ecosystems. Any construction or maintenance activity that affects beds and banks of waterways, riparian vegetation, quality or quantity of water, requires a licence, permit or approval from Melbourne Water.

Implications for the proposed project area

Proposed development within the project area that incorporates works on waterways associated with stormwater facilities etc. will require approval from Melbourne Water via an Agreement process set out in their Land Development Manual http://ldm.melbournewater.com.au/content/introduction/introduction.asp.

4.2.7 Environment Protection Act 1970: State Environmental Protection Policy (Waters of Victoria) 2003

The Environment Protection Act underpins the *State Environmental Protection Policies (SEPP)* which provides a legal framework for the protection and rehabilitation of Victoria's surface water environments. The uses and values of the water environment are known as 'beneficial uses'.

Environmental quality objectives and indicators are defined to protect beneficial uses and an attainment program provides guidance on protection of the beneficial uses. The key beneficial use of relevance to biodiversity is 'Aquatic ecosystems'. The Policy requires that aquatic ecosystems be protected.

Impacts to surface water quality must not result in changes that exceed water quality objectives specified to protect beneficial uses. Proponents and land managers need to ensure that direct and indirect (e.g. runoff) impacts to surface water quality do not exceed the water quality objectives.

The SEPP provides recommendations to ensure that beneficial uses are protected.

Link to further information: http://www.epa.vic.gov.au/water/epa/wov.asp.

Implications for the proposed project area

Development within the project area may directly and/or indirectly impact upon the Werribee River, associated waterways and their aquatic ecosystems. Relevant actions identified in the applicable policy clauses have been incorporated into the mitigation measures (Section 6.1).

Ongoing monitoring of affected surface waters may be required to assess if beneficial uses are being protected. The EPA and Melbourne Water may need to be consulted with regard to establishing appropriate

water quality objectives and monitoring requirements. Impacts to waterways may be avoided through site selection.

4.2.8 Regional Catchment Strategy and River Health Strategy

State Planning Policy Framework Clause 15.01 (Protection of catchments, waterways and groundwater) states that planning and responsible authorities must have regard for the objectives of the *Regional Catchment Strategy* (PPWCMA, 2004). The *Regional River Health Strategy* (PPWCMA, Melbourne Water 2007) provides further recommendations on the protection of existing high-value rivers and creeks that are in good condition and strategic improvement of other rivers and creeks.

Implications for the proposed project area

The key biodiversity objectives of the above Strategies with respect to the aquatic environment will be met if the mitigation measures outlined in this report are complied with.

5. Quantification of native vegetation losses

This report has been prepared to support a referral to the Minister for Planning requesting a decision on whether an Environment Effects Statement (EES) is required for the hydroponics precinct project. Currently, the criteria for deciding whether a project should be referred are listed in the Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978*. For native vegetation impacts, these criteria still reference the former State policy *Victoria's Native Vegetation Management – A Framework for Action 2002*. This policy was replaced, in the context of land use and development controls under the *Planning and Environment Act 1987*, by VC105 amendment to the Victoria Planning Provision in December 2013. The contemporary policy 'Permitted clearing of native vegetation: Biodiversity assessment guidelines' (the Guidelines) is now being used to assess native vegetation removal and offsets in Victoria. Given the divergence between the EES Ministerial Guidelines and the new native vegetation policy setting, this report attempts to provide sufficient information to address the implications of the previous and the current native vegetation policies.

5.1 Permitted clearing of native vegetation: Biodiversity assessment guidelines (the Guidelines)

The Guidelines describe the following objective for permitted clearing of native vegetation in Victoria:

"No net loss in the contribution made by native vegetation to Victoria's biodiversity"

This objective is to be achieved through Victoria's planning system using a risk-based approach that relies on strategic planning and the permit and offset system. The key strategies for achieving no net loss at the permit level are:

- avoiding the removal of native vegetation that makes a significant contribution to Victoria's biodiversity
- minimising impacts to Victoria's biodiversity from the removal of native vegetation
- where native vegetation is permitted to be removed, ensuring it is offset in a manner that makes a contribution to Victoria's biodiversity that is equivalent to the contribution made by the native vegetation to be removed.

The steps that have been taken during the design of the development to ensure that impacts on biodiversity from the removal of native vegetation have been minimised include:

- Location of the project within the area of Green Fields Station where vegetation is highly fragmented, thus, avoiding more intact areas of native vegetation elsewhere on the property.
- Provision of a 25 meter buffer along Ballan Road to ensure the protection of Spiny Rice-flower within the property and populations within the road reserve.
- Retaining a 200 m buffer along the un-named waterway that is located along the northern boundary of the Project Area. Allowance for this buffer avoids any impact to the land covered by the Environmental Significance Overlay – Schedule 1 (Waterway Corridors). It is also in alignment with the federal guidelines for protection of Growling Grass Frog habitat, which recommend a 200 m buffer around water bodies and 100 m buffer along terrestrial corridors (DEWHA 2009).

It should be noted that some works may be required in these buffer areas for service corridors and access to the project area.

DEPI has provided biodiversity information tools to assist with determining the risk associated with permitted clearing and the contribution that native vegetation within the project area makes to Victoria's biodiversity.

All planning permit applications to remove native vegetation are assigned to a risk-based pathway determined by the extent and location of proposed clearing. The risk-based pathway will dictate the information to be provided in a planning permit application and the decisions guidelines the responsible authority (e.g. Council) and/or DEPI as a referral authority will use to assess the permit application.

The biodiversity information tools have two components:

Site-based information

The site-based information is observable at a particular site. Biosis has collected the requisite site-based information for the assessment against the Guidelines. This information is presented below in Section 5.2.1.

Landscape scale information

Landscape scale information requires consideration of information beyond the site. This information is managed by DEPI and can be accessed via the NVIM.

The following section summarises the results of the site-based assessment and the outputs from DEPI's modelled data for the site. At this stage native vegetation data has not been submitted to DEPI for calculation of offset targets under the Guidelines. Therefore, all analysis presented here is based on information available via the NVIM on-line tool and DEPI's spatial layers.

Note: a glossary of terms used in relation to the Guidelines and Habitat hectares assessment is provided in Appendix 4: Glossary.

5.2 Proposed removal of native vegetation

The extent of native vegetation patches and the number of scattered trees were mapped within the project area (Figure 2) and the condition was assessed in relation to standard methods provided by DEPI (DSE 2004). The condition of native vegetation was assessed using the DEPI Vegetation Quality Assessment Sheet (DSE 2004) and pre-determined EVC benchmarks: http://www.dse.vic.gov.au/conservation-and-environment/ecological-vegetation-class-evc-benchmarks-by-bioregion.

The proposed removal of native vegetation was assessed in accordance with the concept design provided (master plan version 6). A total of 160.82 hectares of vegetation was mapped within the proposed project area and associated services alignments within Green Fields Station. Additional vegetation was mapped within the Ballan Road reserve, which is part of a linear patch of vegetation that continues along Ballan Road.

All vegetation within the project area and services alignment is proposed for removal. In addition to this there are a series of cross-overs from Ballan Road to the project area, which will involve removal of vegetation from within Ballan Road reserve. The total proposed area of vegetation removal associated with the project is 161.07 hectares. This equates to a total of 86.88 habitat hectares (Table 5)

5.2.1 Habitat hectares

Areas of uniform quality for each EVC within the patches are termed 'habitat zones' and are assessed separately. The condition score of the habitat zone is multiplied by the extent of the zone to give a value in Habitat hectares.

A total of 90 habitat zones were identified within the project area. The areas of impact for each habitat zone are provided in Appendix 3: Habitat hectare assessment results and summarised below in Table 5 which shows the areas of vegetation to be impacted by the proposed development in habitat hectares.

Table 5: Summary of total number of habitat hectares to be impacted by proposed development

	Plains Grassy Wetland (HHa)	Low-rainfall Plains Grassland (HHa)	Stony knoll Shrubland (HHa)	Plains Woodland (HHa)	Total (HHa)
Ballan Road Access		0.145			0.145
Hydroponics area	0.127	82.948	0.577		83.652
Services alignment	0.118	2.911		0.053	3.082
Total	0.245	86.004	0.577	0.053	86.879

There are ten scattered remnant trees within the project area that are proposed for removal. Under the Guidelines, to calculate the offsets required for removal of a scattered tree, each tree is allocated an area value of 0.071 hectares. These trees equate to 0.71 hectares. A full list of trees recorded within the project area is provided in Appendix 3: Habitat hectare assessment results.

Summary of Habitat hectares within the project area

In summary, the project area contains 86.88 habitat hectares and ten scattered trees that will be impacted by the proposed development. For the purposes of calculating offsets under the Guidelines the project area supports 87.59 Habitat hectares, including the conversion of scattered tree numbers to habitat hectares.

5.3 Determining the risk-based pathway

To determine the risk based pathway for the permit application, two factors are considered: **location risk** and **extent risk**.

Location risk has been pre-determined by DEPI for all locations in Victoria. The location of a particular site is determined using the *Native vegetation location risk map* available in the Native Vegetation Information Management (NVIM) system (http://nvim.depi.vic.gov.au).

The extent risk is based on the extent of native vegetation proposed to be removed. Extent risk is determined with reference to

- the area of any remnant patches of native vegetation proposed to be removed
- the number of any scattered trees proposed to be removed.

DEPI's location risk modelling for the project area is shown in Figure 7. The proposed project area is composed primarily of location risk A, with smaller areas of location Risk B.

The current design plans would involve more than 1 hectare of clearing within location risk B. Therefore, the application for removal of this native vegetation must meet the requirements of, and be assessed on, the high risk-based pathway.

5.4 Offset requirements

Offset requirements for the proposed development are complicated by the Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act 1978* that still reference the previous native vegetation policy (the Framework). Offset requirements under the new Biodiversity Assessment Guidelines use different metrics to the previous Framework policy. Clarification on which approach is most appropriate will be required prior to the precise offsets being calculated in the new metric (i.e. Biodiversity Equivalence Units).

Offsets for cleared vegetation are measured in habitat hectare 'gains'. Habitat hectare gains are generated through protection of native vegetation within an offset reserve and by improvement through management. The area of land required as an offset for vegetation losses is calculated based on the amount of gain that can be generated on that land.

An area south of Ballan Road has been identified as potentially suitable for providing offsets associated with vegetation losses from the proposed development (Figure 6). The area contains a total of 536.76 hectares of native vegetation divided into two main habitat zones: 23A and 23B. By using DEPI's Gain Calculator it has been calculated that the offset site could generate a total gain of 211.69 habitat hectares (Table 6).

Table 6: Habitat hectare gains available from the proposed offset site

Habitat zone(s)	Asset Type*	Area (ha)#	Bioregion	Ecological Vegetation Class (EVC)	EVC number	Conservation status	Habitat score	Security Gain score	Total Gain Score	Total Gain (hha)
Site 23A	RP	85.15	VVP	Plains Grassland	132	Endangered	71	7.1	40.72	34.67
Site 23B	RP	451.58	VVP	Plains Grassland	132	Endangered	60	6.0	39.20	177.02
								Total Gain (hha)		**211.69**

5.4.1 Offsets under the Framework

Under the Framework all vegetation of Very High conservation significance proposed for clearing requires a gain of twice the number of habitat hectares lost. For the current proposal this would total 173.76 habitat hectares. This gain could easily be generated through protection of the proposed offset site as described above.

Under the Framework trees within patches of vegetation, and those outside of patches of native vegetation (termed 'scattered trees') are offset separately to habitat hectares. A total of ten scattered trees occur within the project area. For each tree that is to be removed a number of trees must be permanently protected, and new trees recruited to offset this loss. Table 7 below shows the required offsets for scattered trees within the project area. If all scattered trees are to be removed a total of 15 VLOTs, 12 LOTS and 8 MOTS would need to be protected, and 230 new trees recruited. Alternatively using a 'recruit only' option 1140 trees could be recruited.

Patches of Plains Woodland that are to be impacted by the proposed services alignment (see Figure 2) contain a number of large old trees (LOTs). For the removal of each LOT within these patches eight LOTS would need to be protected and an additional 40 new trees recruited.

The offset area identified in Figure 6 does not contain sufficient trees to meet the offset requirement for clearance of scattered trees and trees within patches under the Framework. If the vegetation losses associated with the project are to be offset under the Framework the offsets for scattered trees and trees in patches would need to be sourced elsewhere on the Green Fields Station property.

Table 7: Scattered tree offset prescription

					Tree Protection			Recruit Only	
Tree No.	Pre 1750 EVC	Conservation Significance	Tree Size	# Trees to be removed	Multiplier protect/ recruit	Offset Total*		Multiplier	Offset Total
88, 90	Plains Woodland	High	VLOT	3	5 / 30	15/90		180	540
91, 93, 95	Plains Woodland	High	LOT	3	4 / 20	12/60		120	360
89, 92	Plains Woodland	High	MOT	4	2 / 20	8/80	or	60	240
					TOTAL number of plants to be recruited				1140

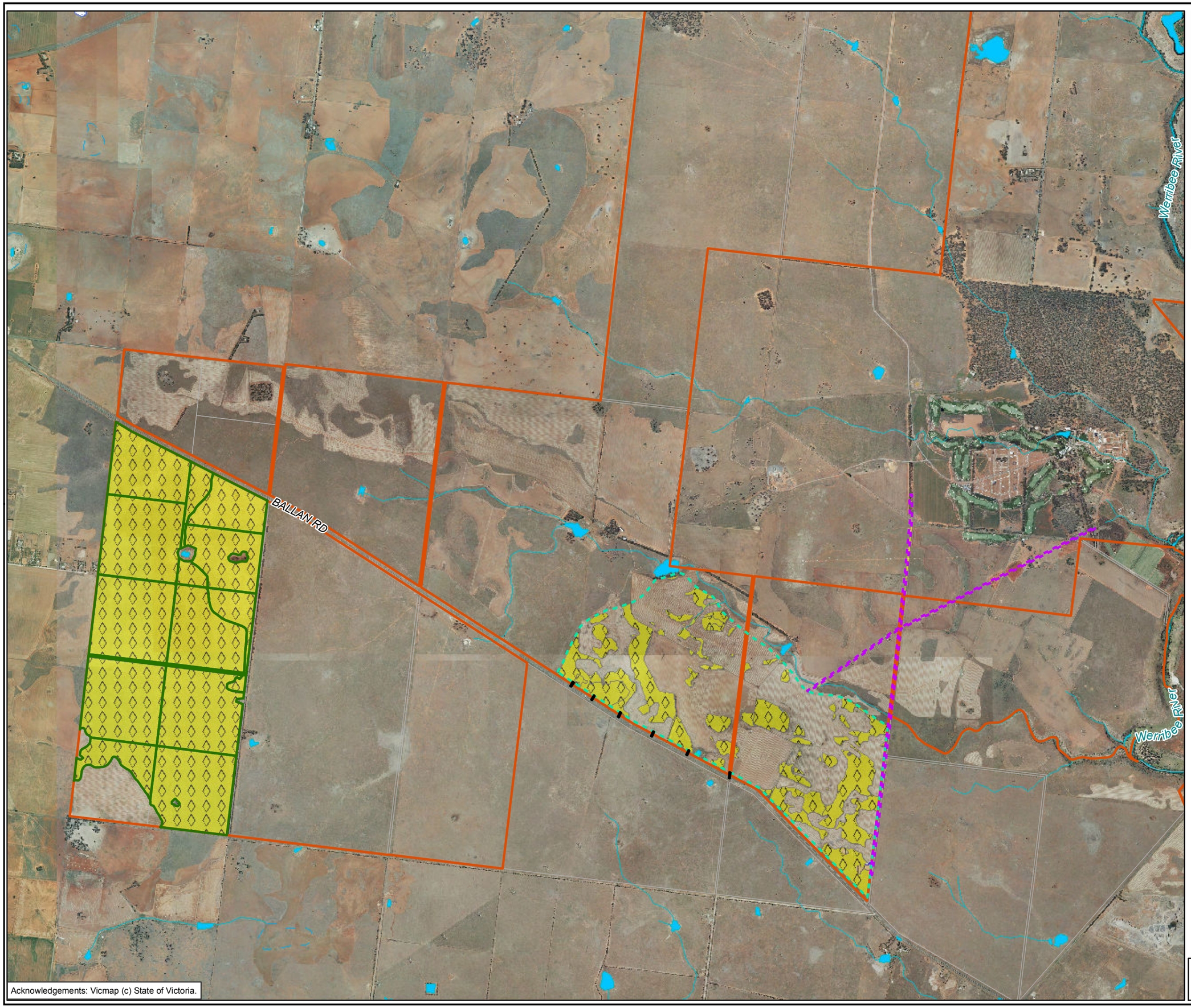
5.4.2 Offsets under the Biodiversity Assessment Guidelines

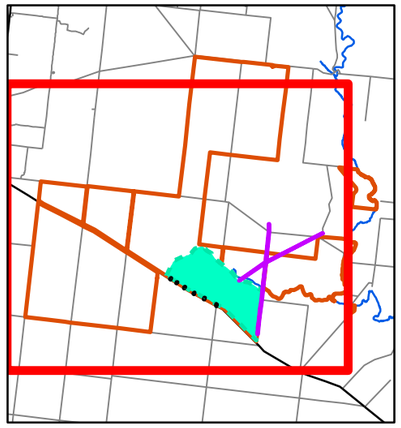
Under the Guidelines, both vegetation losses and offset gains are measured in Biodiversity Equivalence Scores and Units (BES and BEU). Biodiversity Equivalence Scores can be obtained by multiplying the habitat hectare value of the loss by the average strategic biodiversity score (SBS) of clearing site for general offsets, or the habitat importance score for specific offsets. The weighted-average strategic biodiversity score, and the specific-general offset test for determining the type of offset for high risk-based pathway applications, can only be determined accurately by submitting clearing data to DEPI native vegetation support. However, by examining DEPI's strategic biodiversity score model (Figure 8) we can indicatively determine the average SBS for the project area.

Strategic biodiversity scores for the project area range from very low to very high, so a mid-range SBS of 0.5 is appropriate for the project area. If a general offset was required, the loss of 86.88 habitat hectares would be multiplied by the SBS (0.5) to produce a general biodiversity equivalence score of approximately 43.44. Under the Guidelines the offset required for a given loss is calculated by multiplying the loss by a 'risk offset factor' which takes into account the potential for an offset to fail to adequately generate the gain required. For proposals requiring a general offset the risk factor is 1.5 times the general biodiversity equivalence score. Therefore, the project's general offset requirements would be in the order of 65.16 BEUs.

The strategic biodiversity score for the proposed offset area is relatively high with an approximate average value of 0.8. This would result in a total available gain of approximately 169.35 BEUs which would readily meet the requirement of 86.88 BEUs under the Guidelines. The high SBS and close proximity would meet the Guidelines offset attributes.

The above discussion does not address the potential need for specific offsets driven by modelled rare and threatened species habitat in the project area. The scale of specific offsets can only be determined by submitting clearing data to DEPI so the specific-general offset test can be applied. All vegetation mapping has been undertaken to DEPI standards for this project. If required, a request can be made to DEPI to undertake the detailed calculations.





Legend

- Green Fields Station
- Potential Offset area

Hydroponics project area

- Ballan Road Access
- Hydroponics area
- Service corridors
- Cadastre

Ecological Vegetation Classes

- 125 Plains Grassy Wetland
- 132_63 Low-rainfall Plains Grassland
- 649 Stony Knoll Shrubland
- 803 Plains Woodland

Figure 6: Potential offsets available from the Green Fields Hydroponic Precinct Project

0 350 700 1,050 1,400 1,750

Metres

Scale: 1:35,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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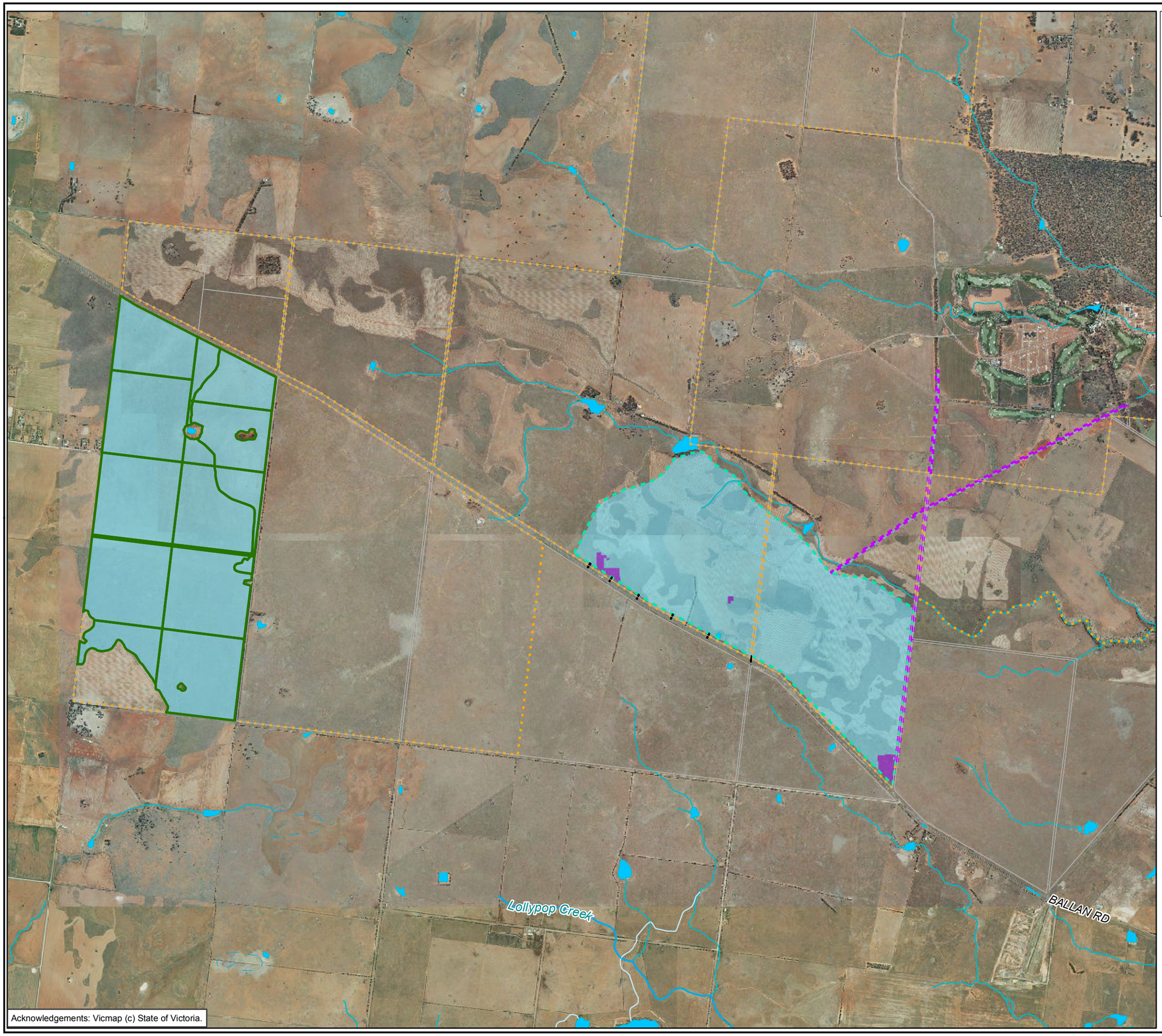

Legend

- Green Fields Station
- Hydroponics project area
- Hydroponics area
- Ballan Road Access
- Service corridors
- Cadastre

Location risk

- Location A
- Location B

Figure 7: DEPI Location Risk Map for the study area

0 350 700 1,050 1,400 1,750

Metres

Scale: 1:35,000 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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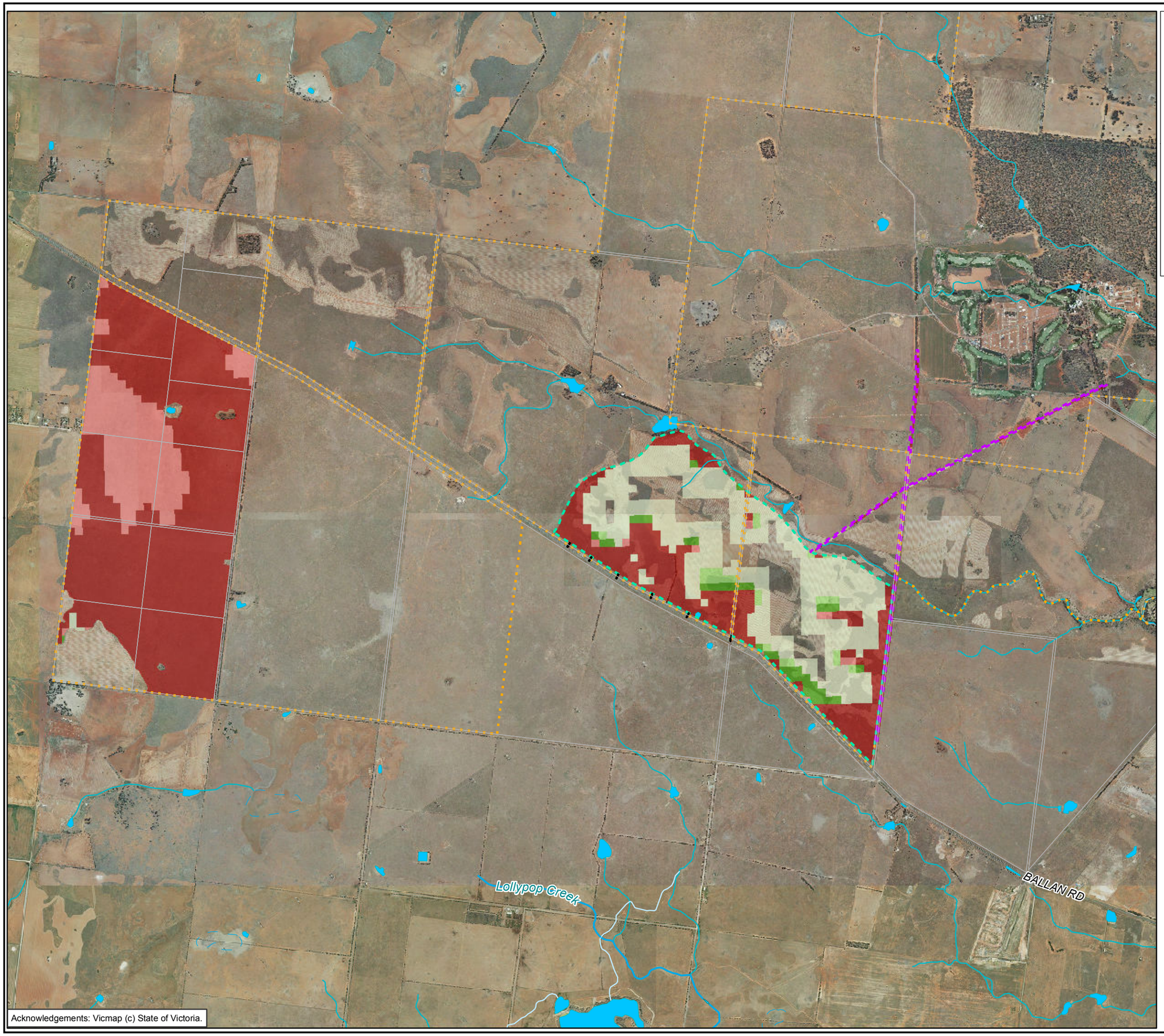

Legend
- Green Fields Station
- Hydroponics project area
- Hydroponics area
- Ballan Road Access
- Service corridors
- Cadastre

Strategic biodiversity score
- 0.81 - 1.00
- 0.61 - 0.80
- 0.41 - 0.60
- 0.21 - 0.40
- 0.01 - 0.20

Figure 8: DEPI Strategic Biodiversity Score for the study area

0 350 700 1,050 1,400 1,750

Metres
Scale: 1:35,000 @ A3
Coordinate System: GDA 1994 MGA Zone 55

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6. Key ecological values and mitigation measures

This report identifies extensive areas of native vegetation, including threatened vegetation communities and known populations of threatened species within the project area. The following recommendations and mitigation measures will assist JAC Land in ensuring that the impacts to these values are minimised where possible and that the development of the project area does not have a detrimental impact on the biodiversity of the wider Green Fields Station.

6.1 Opportunities to reduce potential impacts

The following general recommendations have been made regarding opportunities to reduce potential impacts to biodiversity values within the project area. Relevant points should be incorporated into a development planning and Construction Environmental Management Plans to ensure that the significant risk of adverse environmental impacts is minimised.

Design and pre-construction

- Avoid and minimise impacts to Victoria's biodiversity, in accordance with the Guidelines, by avoiding and minimising the removal of native vegetation.
- Identify and appropriately protect offsets for vegetation and habitat losses. This report identifies a potential on-site offset that would meet the requirements of the project (Section 5.4).
- Develop and implement an Offset Management Plan for any offsets on site.
- Incorporate buffers around areas to be retained for conservation to reduce the potential for spread of noxious weeds and feral animals.
- Prepare translocation plans for rare or threatened plant taxa which will be otherwise displaced by development.
- Within any Construction Environmental Management Plans, mitigation measures should be detailed for the potential encounter of significant species during the construction phase.
- During the design phase of the project conduct targeted surveys for threatened species, at the appropriate time of year, within Ballan Road reserve to ensure that threatened species are not impacted by the proposed cross over points from Ballan Road to the project area.
- Avoid and minimise alterations to waterways:
  - Waterways, wetlands and floodplains (1 in 100 years) should be retained within reserves and should be buffered from development and construction zones by a minimum distance of 30 m, and up to 100 m in areas known or likely to provide habitat for Growling Grass Frog. This will be achieved for the drainage line to the north of the project area.
  - Stormwater treatment facilities (e.g. treatment/retention wetlands) should not be placed online, but rather placed parallel (i.e. within reserves).
  - Minimise vehicle and pedestrian crossings of waterways and ensure that all crossings allow for unimpeded fish passage in accordance with relevant guidelines (Fairfull & Witheridge 2003).

- Minimise alteration to surface water and groundwater hydrology (including, timing, quality and quantity) through incorporation of Water Sensitive Design features. That is, the volume, timing and frequency of treated stormwater discharge (i.e. overflow) into waterways should mimic as closely the volume, timing and frequency that would be expected to be conveyed to waterways from each catchment unit under natural conditions in response to rainfall events.
- Monitor water quality within unnamed creeks/drainage lines and the Werribee River at an appropriate number of sites and locations relative to the project area (i.e. upstream and downstream) in a water quality monitoring program designed by an appropriately experienced aquatic ecologist in consultation with EPA Victoria and Melbourne Water.

Construction

- Keep the construction footprint to a minimum, especially in areas of native vegetation and fauna habitat. Utilise existing tracks and degraded areas where possible.
- Protect areas of retained native vegetation and areas of environmental sensitivity. These areas should be fenced and treated as no-go zones. This includes the buffers along the unnamed water course and Ballan Road.
- Prevent access to no-go zones; including vehicles, construction personnel, equipment and stockpiles.
- For any trees that are to be retained ensure that an adequate tree protection zone is fenced around the tree. This should be a circular zone with a radius 12 times the diameter of the tree trunk at 1.3 m from the ground, up to a maximum of 15 m radius.
- All tree lopping should be conducted by a qualified arborist.
- Limbs and trunks from any trees that are removed or lopped as part of construction works should be retained nearby where they can continue to provide fauna habitats.
- All protective fencing must be maintained in good repair throughout construction.
- Manage construction works to minimise discharge of sediments and other pollutants. Suitable measures are provided in Environmental Guidelines for Major Construction Sites (EPA 1996, amended) and Construction Techniques for Sediment Pollution Control (EPA 1991) and Guideline for Environmental Management. Doing it right on subdivisions. Temporary environmental protection measures for subdivision construction sites. (EPA 2004).
- All sediment control measures must be maintained in good repair and regularly inspected to ensure adequate performance throughout construction.
- Avoid operational discharges to waterways. If such discharges cannot be avoided they should be minimised through water re-use and recycling. Discharges should be monitored to assess the protection of beneficial uses.
- Consider undertaking monitoring of significant flora and fauna populations during and following development. Existing Spiny Rice-flower that are to be retained within the 25 m buffer along Ballan Road could be monitored to ensure their survival.

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