Native Vegetation Report
Detailed Assessment

for

Proposed Numurkah Flood Mitigation Project Stage 1 - Levee Construction, Numurkah, VIC 3636

Version 1

Date: 19/12/23

94 Kirby Flat Road,
Yackandandah, VIC 3749
Phone: 0402 344 574
ABN: 797 823 838 29
damian.wall@red-gum.com.au

RED-GUM Environmental Consulting

CERTIFIED ENVIRONMENTAL PRACTITIONER 2023/2024 CEnvP No. 237

Contents

LIST OF FIGURES

LIST OF MAPS

LIST OF TABLES

1 Introduction

1.1 Project Background

Red-Gum Environmental Consulting Pty Ltd (Red-Gum) was commissioned by Moira Shire Council (Council) to undertake a detailed native vegetation assessment of Stage 1 of the proposed Numurkah Flood Mitigation Project for the construction of a flood levee in the Numurkah township ('the project').

This project proposes the construction of approximately 3.5 kilometres of mounded-earth levees and levee walls which will be located north of Broken Creek (**Map 1A and Map 1B**). The project is seen as important to protect the township from potential future flooding events and has been designed as per the Victorian Government's Levee Management Guidelines (DELWP 2015).

The project proposes approximately 3.5 kilometres of flood levee installed over a three-hectare footprint and includes the following elements:

- Approximately 1.9 kilometres of one-metre-high permanent mounded-earth levee with a three-metre-wide crest and three-metre-wide battered slopes either side forming a total width of approximately 9 metres (**Figure 1 and Map 1B**). The levee core will be composed of clay, with batter-fill drawn from existing site material (sandy clay). The clay core will be excavated to a depth of 0.6 metres before installation, and topsoil either side of the core will be stripped to 0.15 metres. The earth levee will require a three-metre construction buffer either side during the build process (meaning a total impact width of 12 metres). The earth levee maintenance will occur via vehicle access along the levee itself on the 3-metre crest, which will act as walking track/maintenance track/emergency access.

- Approximately 1.5 kilometres of one-metre-high permanent concrete wall levee with a one-metre-wide and 0.45 metres deep footing on top of 0.15 metres of Fine Crushed Rocks (FCR) bedding (**Figure 2 and Map 1A**). Total excavation width to one-metre-wide to a depth of 0.6 metres. The permanent concrete wall levee will require a 3-metre construction buffer either side during the build process (meaning a total impact width of seven metres). No maintenance access is not required for concrete wall sections as all wall sections are adjacent to existing roads.

- Eleven (one-metre-high) temporary wall levees to be installed across existing roads/access points prior to and during flood events, totalling approximately 0.14 kilometres. These will be completely removed when floodwaters have receded. As these temporary levees will not impact any existing biodiversity or native vegetation, they have been excluded from this assessment.

The project aims to avoid biodiversity impacts, and where avoidance is not possible, minimise potential adverse effects on native vegetation and fauna, as well as address offset requirements consistent with the Guidelines for the removal, destruction or lopping of native vegetation.

1.2 Scope of the Assessment

The scope of works for the ecological assessment includes:

- Desktop review of known and/or predicted ecological values occurring within the study area;
- Assessing and mapping ecological values and identify their quality and extent within the study site;
- Identifying the presence and likelihood of occurrence of State and Commonwealth listed threatened flora, fauna, and communities within the study site;
- Identifying the potential impacts to these ecological values, including implications under relevant legislation and policies;
- Providing recommendations and outlining appropriate measures to avoid and minimise impacts, mitigate the effects of acceptable impacts and offset unavoidable impacts to native vegetation and threatened species, where applicable; and
- Preparing a report to document the results of the ecological assessment.

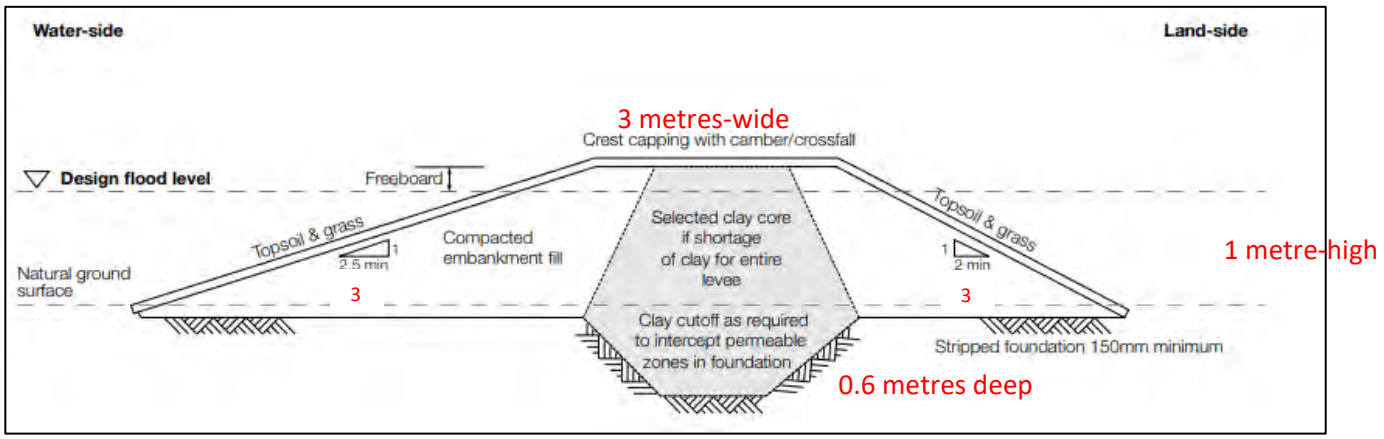


Figure 1. Components of the proposed permanent earthen levee bank for the Numurkah Flood Mitigation Project.

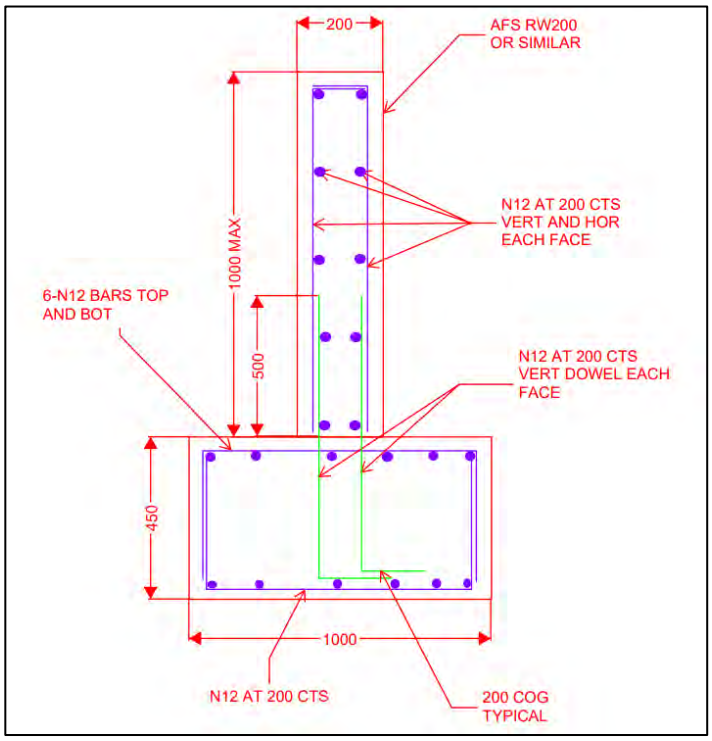


Figure 2. Components of the proposed permanent concrete wall levee for the Numurkah Flood Mitigation Project.

1.3 Location of the Study Area

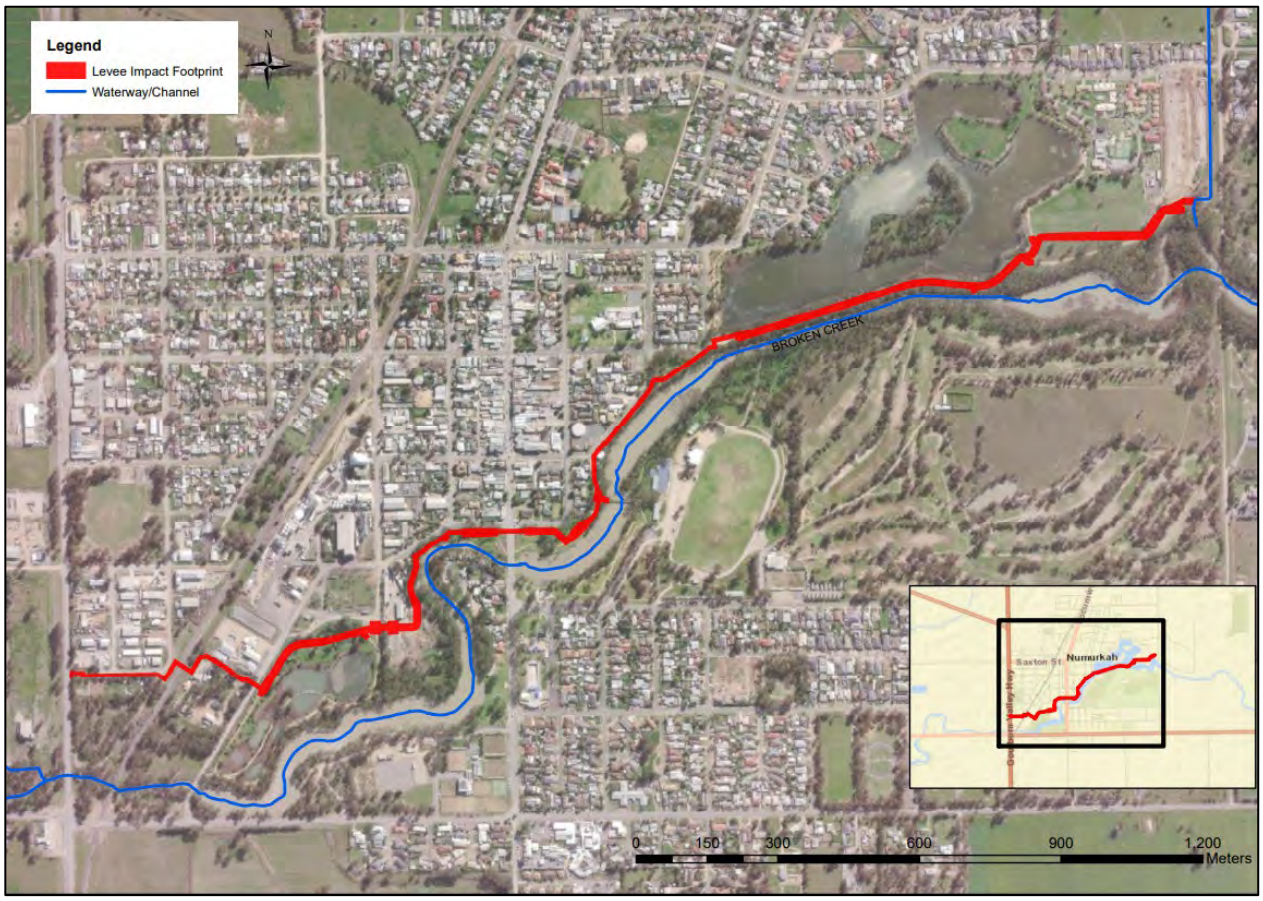
The project study area is located within the township of Numurkah, north of Broken Creek (Victoria), extending east of the Goulburn Valley Highway through to Kinnairds Road (**Map 1**).

The project study area occurs within the Victorian Riverina Bioregion, Moira Shire Council Local Government Area (LGA) and Goulburn Broken Catchment Management Authority (GBCMA) areas (**Map 1**).

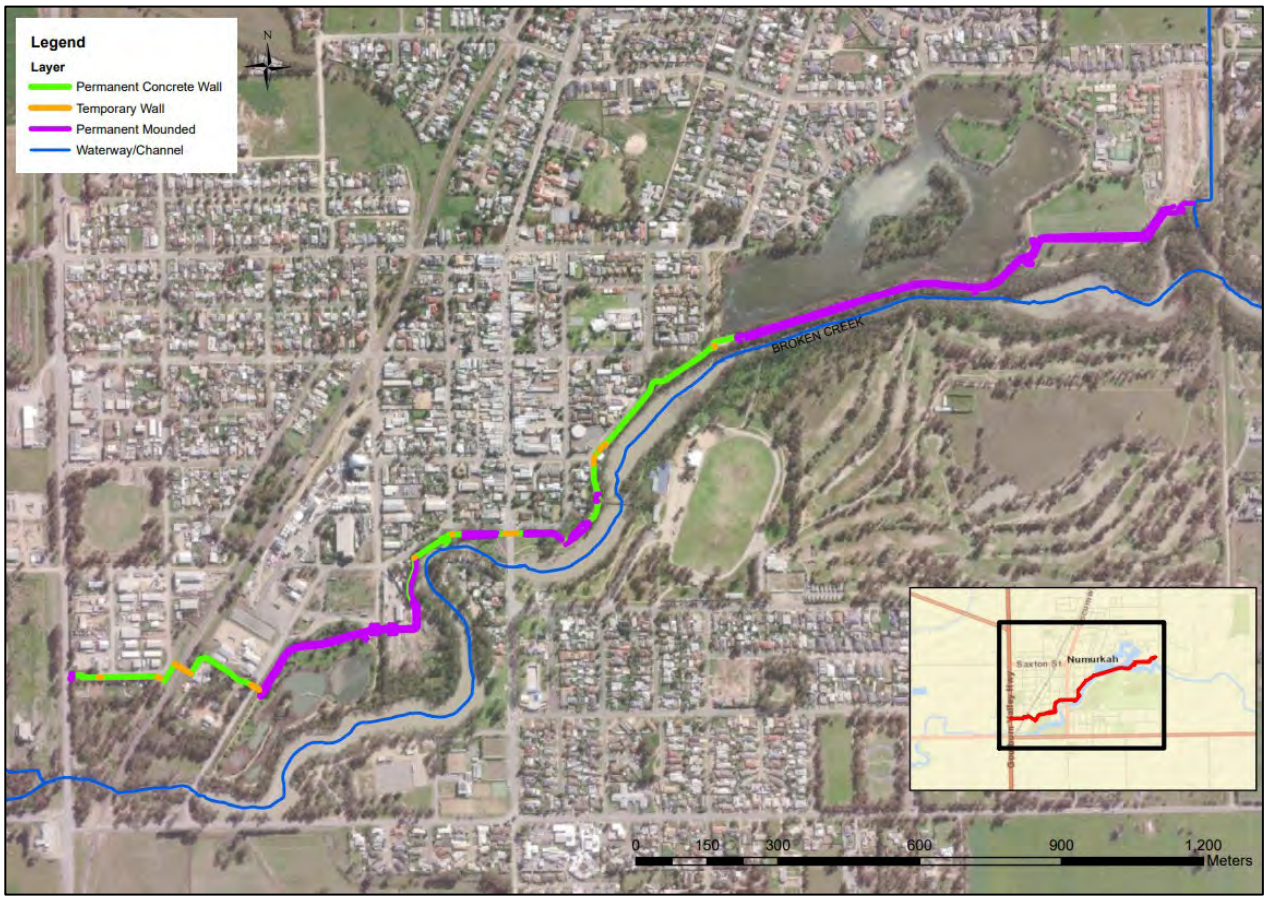
The 3.5-kilometre assessment area varied depending on the proposed permanent levee type with permanent mounded-earth levees requiring a 15-metre-wide impact zone, and permanent concrete levee walls requiring a 7-metre-wide impact zone (**Map 2**). The assessment covered approximately 15 hectares in total and included the mapping of impacted canopy and scattered trees (those with Tree Protection Zones (TPZs) occurring at least 20 metres from the impact zone (**Map 3 to 7)).**

The levee sections are specifically referred to as:

- Section 1: Goulburn Valley Highway/Needham Street to Station Street (**Map 3**)
- Section 2: Station Street to Melville Street (**Map 4**)
- Section 3: Melville Street – Gray Street to Numurkah Lake Carpark (**Map 5**)
- Section 4: Lake Numurkah Path West (**Map 6**)
- Section 5: Lake Numurkah Path East to Kinnairds Road (**Map 7**)



Map 1: Overview of the project study area north of Broken Creek, Numurkah, Victoria.

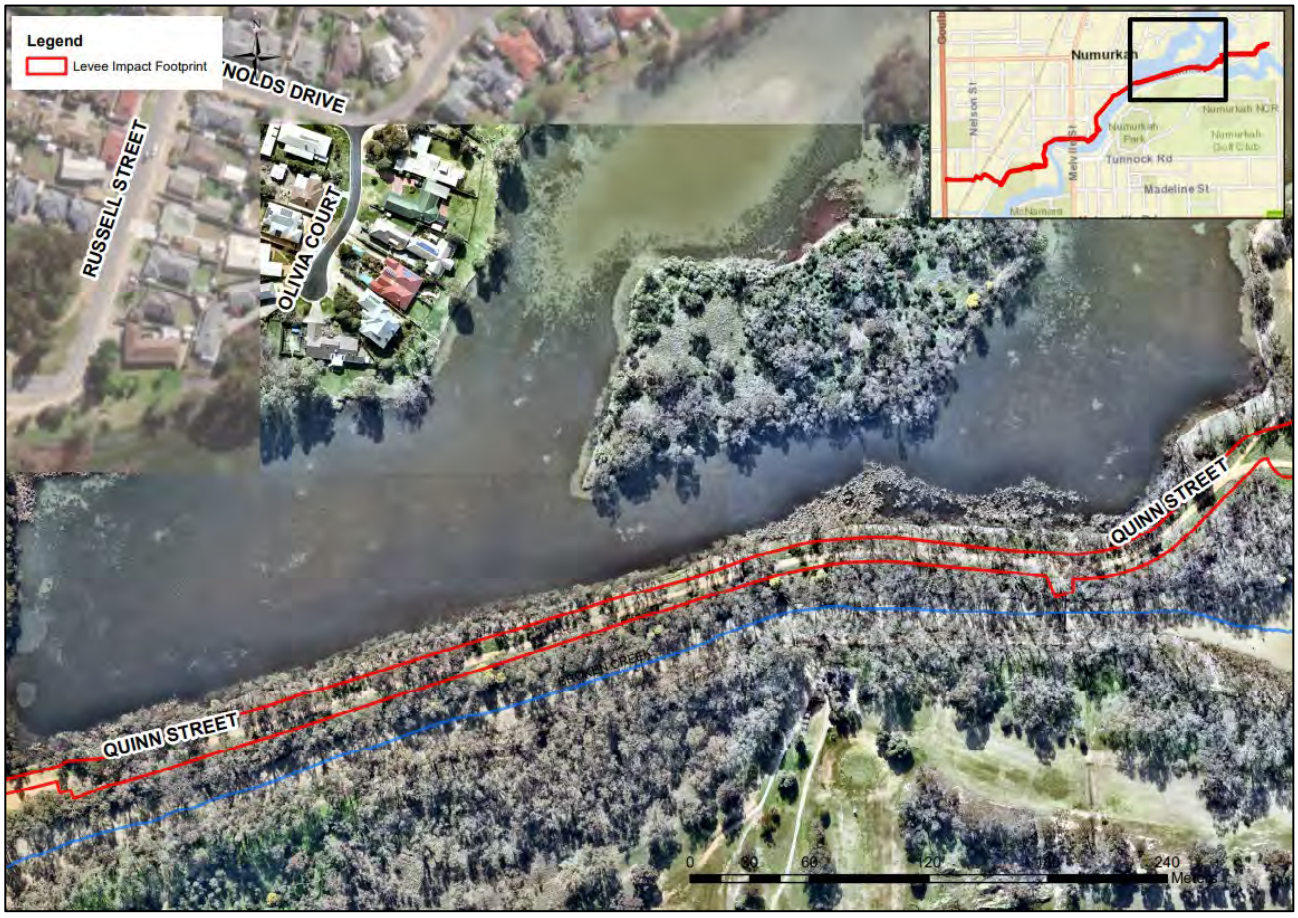


Map 2: Overview of the proposed flood levee type locations, Numurkah, Victoria.

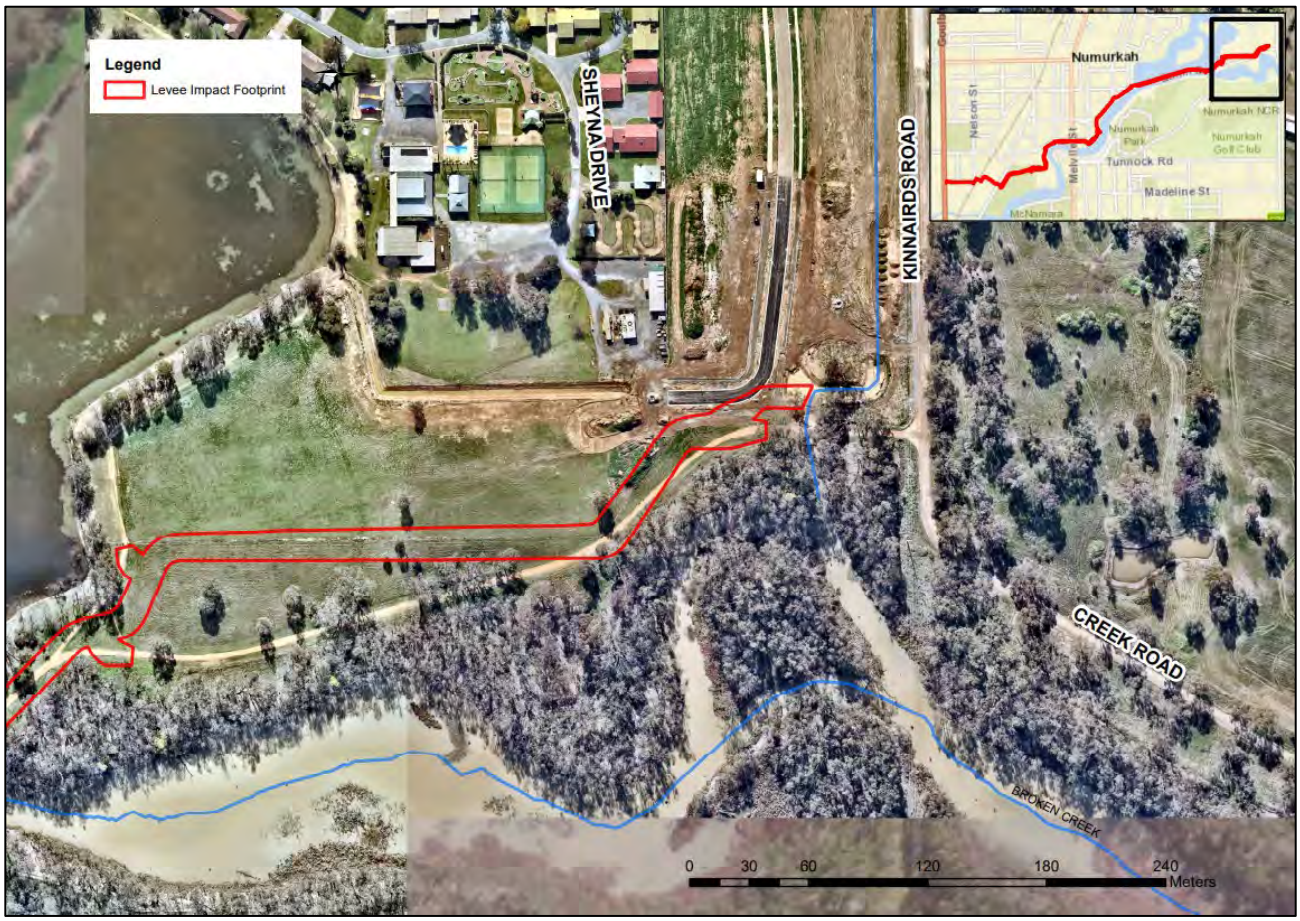
Map 3: Overview of Levee Section 1 - Goulburn Valley Highway/Needham Street to Station Street.

Map 4: Overview of Levee Section 2 - Station Street to Melville Street.

Map 5: Overview of Levee Section 3 - Melville Street – Gray Street to Numurkah Lake Carpark.



Map 6: Overview of Levee Section 4 – Lake Numurkah Path West from Quinn Street.



Map 7: Overview of Levee Section 5 - Lake Numurkah Path East to Kinnairds Road.

2 Methods

2.1 Database Review

As part of due diligence, a review of relevant Victorian and Commonwealth Government biodiversity databases was undertaken. Information about flora and fauna located within five kilometres of the study area was downloaded and assessed. The relevant records and provisions from the following databases were reviewed:

- The Department of Energy, Environment and Climate Action's (DEECA) Victorian Biodiversity Atlas (VBA) flora and fauna species.
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES) relevant to the study area, including wetlands, threatened ecological communities/species and migratory species.
- DEECA's NatureKit mapping for Ecological Vegetation Classes (EVCs) (extant and pre-1750s), location risk mapping, and Habitat Importance Maps (DEECA 2023a).
- DEECA's Native Vegetation Information System (NVIM) for biodiversity information relevant to the study area including public land, bioregions, catchments, and modelled native vegetation.
- DEECA's Mapshare Interactive Mapper and the Victorian Department of Planning and Transport Planning Schemes Online and Planning Maps Online for local government areas planning zones, overlays and schedules.

2.2 Definitions of Significance

Threatened species and communities are declared under the Commonwealth's *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act). The significance of a species or ecological community is determined by its listing status under the EPBC Act and FFG Act. Lists of significant species generated from the databases and all species recorded on site are provided in **Appendix 1B** (flora) and **Appendix 2B** (fauna), and the significant species have been evaluated regarding their likelihood of occurrence in the study area based on the process outlined below. The habitat value for species listed on the FFG Act is calculated by the Habitat Importance Modelling produced by DEECA.

2.3 Evaluating the Likelihood of Occurrence of Significant Species

The likelihood of occurrence indicates the potential for a significant or listed threatened species or ecological community to occur regularly within the study area. It is based on expert opinion, information in relevant biodiversity databases and reports, and an assessment of the habitats on site. The likelihood of occurrence is ranked as: Negligible, Low, Medium, High, or Recorded. The justification for ranking is provided in **Appendix 1B** and **Appendix 2B**. Species that have at least a medium likelihood of occurrence are given further consideration in this report. The need for targeted surveys for these species is also considered.

2.4 Site Assessment

The biodiversity assessment of the of the entire project area was undertaken over two survey efforts by two qualified Red-Gum Environmental Consulting ecologists/botanists between 26 July and 28 August 2023. A detailed ecological assessment was conducted which involved:

- A Habitat Hectares assessment in accordance with current DEECA methodology and the *Vegetation Quality Assessment Manual* (DSE 2004). Data was collected in accordance with the Victorian Guidelines for the removal, destruction or lopping of native vegetation (The Guidelines - DELWP 2017) and included mapping of:
  - Remnant patches of native vegetation (including canopy drip line and on-ground extent of understorey collected by a surveyor to an accuracy of <1 m)
  - Scattered trees and canopy trees within patches within the impact footprint (as per the Assessor's handbook Applications to remove, destroy or lop native vegetation, DELWP 2018).
  - Scattered and canopy trees within 20 metres of the impact footprint (as per the *Assessor's handbook Applications to remove, destroy or lop native vegetation*, DELWP 2018).
- Identifying the presence or likelihood of occurrence of threatened species and ecological communities listed under the FFG Act and EPBC Act.
- Recording the number of specimens of FFG Act-listed protected flora recorded within the study site; and
- Recording all native and exotic flora encountered during the site assessment.
- Recording all incidental fauna species encountered during vegetation assessment tasks.

Data from the site assessment was used to inform the outcomes of this report. Data was collected using a hand-held GPS unit and Avenza mapping software. The accuracy of the mapping is generally accurate to +/- 5 metres and is deemed to be sufficient for the purposes of the assessment. Where data accuracy is suspect, minor alterations may be made using the latest aerial photography available for the study area. The report mapping was developed using ArcGIS software. Species nomenclature for flora follows the Victorian Biodiversity Atlas (VBA). A variety of survey methods were employed during the field assessment stage.

2.5 Report Limitations

The biodiversity assessment of the of the entire project area was undertaken over two survey efforts by two qualified Red-Gum Environmental Consulting ecologists/botanists between 26 July and 28 August 2023. This provided high confidence that species for these areas have been adequately captured during the assessment process, even though the bulk of initial assessments were undertaken during a somewhat sub-optimal time of year for conducting surveys. A species list of flora encountered has been provided (**Appendix 1A**) which is considered an adequate representation of site condition and is sufficient to determine potential impacts associated with the development, while guiding ongoing land management across the site. Only incidental fauna species encountered during vegetation assessment tasks were recorded, therefore some fauna species onsite are likely to have not been observed. The focus regarding fauna was to undertake a likelihood assessment on the suitability of habitat present for any significant species recorded from the database search.

2.6 Review of Legislation and Policy

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- Matters listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), associated policy statements, significant impacts guidelines, listing advice and key threatening processes;
- Threatened taxa, communities and threatening processes listed under Section 10 of the *Flora and Fauna Guarantee Act 1988* (FFG Act);
- Guidelines for the Removal, Destruction or Lopping of Native Vegetation (DELWP 2017);
- Native Vegetation Management Plans prepared by Catchment Management Authorities;
- *Planning and Environment Act 1987* (specifically Clauses 12.01-2, 52.17 and 66.02) and overlays in the Indigo Planning Scheme;
- Noxious weeds and pest animals lists under the *Catchment and Land Protection Act 1994* (CaLP Act);
- *Fisheries Act 1995* (where relevant);
- *Water Act 1989* (where relevant); and
- *Environment Protection Act 1971*: *State Environmental Protection Policy (Waters of Victoria) 2003* (where relevant).

3 Results

Species recorded during the flora and fauna assessment are listed in **Appendix 1A** (flora) and **Appendix 2A** (fauna). A total of 155 flora species were identified, with 97 being introduced species. A total of 49 fauna species were identified, with 3 being introduced species. No rare or threatened flora or fauna species were observed on site (after DEECA 2023a; DCCEEW 2023b). Significant species predicted to occur in the local area are provided in **Appendix 1B** (flora) and **Appendix 2B** (fauna) along with a likelihood assessment of their suitability of habitat present within the study area.

3.1 Vegetation and Habitat

The linear impact site encompasses approximately 3.5 kilometres of flat plains north of Broken Creek between the Goulburn Valley Highway and Kinnairds Road in the township of Numurkah, covering approximately threehectares. The proposed levee occurs within public community parkland reserves and along existing multi-use paths, streets/roads and railway reserves, and is surrounded by a mix of residential and commercial properties (**Map 1 to Map 7**). Photos are provided in **Appendix 5**. Much of the study area has been cleared of native vegetation, supporting predominantly introduced vegetation that is frequently mown and/or planted ornamental trees/shrubs of limited value for native fauna and flora.

Notwithstanding the above, the study area supports a range of ecological features including areas (patches) of native vegetation, scattered trees and shrubs which are predominantly representative of Plains Grassy Woodland (EVC 55_61) and/or derived grassland or Plains Woodland (EVC 803) of varying condition from the Victorian Riverina bioregion. Riparian areas immediately adjoining the Broken Creek and Numurkah Lake are dominated by River Redgum *Eucalyptus camuldulensis* and Grey Box *Eucalyptus microcarpa*. These features are described further in **Table 1**. This mostly aligns with DEECA 2005 modelled EVC data which shows either Plains Grassy Woodland/Gilgai Wetland Mosaic (EVC 259) or Shallow Sands Woodland/Plains Woodland Mosaic (EVC 867) (**Map 8**).

Table 1. Summary of vegetation and habitat types within the study area.

Vegetation or Habitat Type	Description	Location	Significant Values
Plains Woodland (EVC 803)	Described formally as an open, eucalypt woodland to 15 metres tall over a sparse shrub layer with an understorey layer of grasses, herbs, and chenopods. Within the study site, Grey Box (*Eucalyptus microcarpa*) dominated the canopy. The quality of understorey varied from patches of purely introduced/exotic grasses and herbaceous weeds to areas of diverse native grasses, herbs, and chenopods. In these areas, the ground cover layer included: Spear-grass (*Austrostipa spp*), Wallaby Grass (*Rytidosperma spp.),* Windmill Grass (*Chloris truncata*), Silky Blue-grass (*Dichanthium sericeum*), Spider Grass (*Enteropogon acicularis*), Saloop (*Einadia hastata*), Nodding Saltbush (*Einadia nutans*) and Ruby Saltbush (*Enchylaena tomentosa var. tomentosa*).	Patches occurred in Levee Section 1 represented by Habitat Zones 1A (**Table 16A**).	A state and federally threatened ecological community (TEC) (endangered). Where canopy exists, some areas contained large remnant hollow-bearing trees. Includes some areas of potential habitat for those listed woodland flora and fauna species with greater than medium likelihood of occurrence **Appendix 1B and 2B**.
Plains Grassy Woodland (EVC 55_61)	Occur on the secondary or non-active alluvial terrace (as opposed to the floodplain) and described as an open eucalypt woodland to 15 metres tall over a sparse shrub layer with a diverse layer of grasses and herbs. Within the study site, River Redgum and Grey Box dominated and the occasional Golden Wattle (*Acacia pycnantha)*, Sweet Bursaria (*Bursaria spinosa*), Gold-dust Wattle, (*Acacia acinacea*) Lightwood (*Acacia implexa*), Kurrajong (*Brachychiton populneus subsp. populneus*), Varnish Wattle (*Acacia verniciflua*), Hop-bush (*Dodonaea viscosa subsp. cuneata*) and/or Silver Wattle (*Acacia dealbata*). The quality of understorey varied from patches of purely introduced lawn grasses and herbaceous weeds to areas of diverse native grasses and herbs such as Common Tussock-grass (*Poa labillardierei*), Spear-grasses (*Austrostipa spp.),* Wallaby Grasses (*Rytidosperma spp.)*, Sedge (*Carex* spp.), Rush (*Juncus* spp.), Windmill Grass (*Chloris truncata*), Spider Grass (*Enteropogon acicularis*), Roly-poly (Sclerolaena spp.), Saloop (*Einadia hastata*), Nodding Saltbush (*Einadia nutans*), Cudweed (*Euchiton* spp.) and Cotton Fireweed (*Senecio quadridentatus*). Some patches were only native canopy and/or derived low diversity mown native grasses.	Patches occurred in Levee Section 2, 3, 4 and 5. Patches are represented by Habitat Zones 2A and 2B, 3A to 3G, 4A to 4G, 5A and 5B (**Table 16A**).	A state and federal endangered vegetation community. Where canopy exists, many areas contained large remnant hollow-bearing trees with some fallen woody debris below. Includes some areas of potential habitat for those listed woodland flora and fauna species with greater than medium likelihood of occurrence **Appendix 1B and 2B**.

Vegetation or Habitat Type	Description	Location	Significant Values
Broken Creek waterbody/wetland	This waterbody/wetland includes floodplain associated with the Broken Creek (as a distributary of the Broken River west of Winton Wetlands) with a mean annual discharge of ~74,300 megalitres into the Murray River. It is kept artificially high for for irrigation purposes and largely dominated by River Redgum with generally poor water quality reflecting the highly modified natural environment. It is eventually associated with RAMSAR-listed Barmah-Millewa Forest wetlands.	Adjoin all levee sections, but all occur outside the impact footprint area in the aquatic areas.	The Lower Broken Creek is listed in *the Directory of Important Wetlands in Australia* for containing threatened aquatic species and being important for many listed and/or migratory waterbirds (Environment Australia, 2001). It's also an important habitat corridor throughout the predominantly cleared broader landscape, especially in times of drought.
Scattered trees	Scattered small, medium and large trees (as determined by their EVC benchmark and diameter at breast height) that are dead or alive. Most scattered larger trees contain hollows.	Throughout the study area.	Many scattered trees were large remnant hollow-bearing trees with some fallen woody debris below. Eucalypts in these areas offer potential habitat for foraging and breeding for more mobile fauna species, and act as stepping-stones of habitat.
Predominantly introduced vegetation	Much of the study area supports non-native species, particularly exotic annual and perennial grasses and herbs such as Brome Grass (*Bromus spp*.), Rye Grass (*Lolium spp*.), Paspalum (*Paspalum spp.*), Veldt grass (*Ehrharta* spp.), Wild Oats (*Avena fatua*), Kikuyu (*Cenchrus clandestinus*), Cocksfoot (*Dactylis glomerata*), Couch (*Cynodon dactylon var. dactylon*) Canary-grass (*Phalaris* spp), Soursob (*Oxalis pes-caprae*), Annual Meadow-grass (*Poa annua*), Prickly Lettuce (*Lactuca serriola*), Mallow (*Malva* spp.), Nightshade (*Solanum* spp.), St John's Wort (*Hypericum perforatum*), Ribwort (*Plantago lanceolata*), Flatweed (*Hypochaeris* spp.), Ox-tongue (*Helminthotheca echioides*), Paterson's Curse (*Echium plantagineum*), Cape Weed (*Arctotheca calendula*), Heron's-bill (*Erodium* spp), Clover (*Trifolium* spp.) and Sow-thistle (*Sonchus* spp) . Some non-native garden escapees or environmental weeds occurred too such as Peppercorn (*Schinus molle*), Sweet Briar (*Rosa rubiginosa*), Blackberry (*Rubus fruticosus*), Privet (*Ligustrum spp*.), White Cedar (*Melia azedarach*), Desert Ash (*Fraxinus angustifolia*), Box Thorn (*Lycium ferocissimum*), Wild Olive (*Olea europaea subsp. europaea*), and Willow (*Salix* spp.).	Majority of the study area – across all levee sections with or without native canopy. Often Mown.	Little habitat value for flora and fauna.

Vegetation or Habitat Type	Description	Location	Significant Values
Non-endemic planted vegetation	Non-endemic planted vegetation commonly occurs in public parklands and community spaces as part of gardens/landscaping; and nearby private residential/commercial gardens and streetscapes or as agricultural or irrigation channel bank plantings. These generally contain few habitat values for most indigenous fauna species; however, these gardens may support a range of common native and introduced bird species, particularly when in flower.	Throughout the study area in public parklands and community spaces, streetscapes and private residential/commercial properties.	These gardens may support a range of common native and introduced bird species, particularly when in flower. Flowering eucalypts that are not indigenous to the local area offer possible foraging habitat for Regent Honeyeater, Swift Parrot (*Lathamus discolor*) and Grey-headed Flying-fox (*Pteropus poliocephalus*) on an irregular basis.

3.2 Landscape Value

At the broader landscape scale, the landscape is largely cleared and modified by human-induced action such as agriculture and urban development, leaving the key native vegetation patches and habitat refuges along the Broken Creek, local roadsides and within public reserves, all of which are listed as endangered woodland communities by both the Commonwealth and Victorian governments. These areas perform as important habitat corridors, being the main and last remaining habitat connection across the broader area from the Broken River to the Murray River/Barmah-Millewa forests and wetlands to the north. Areas of diverse woodland groundcover with little exotic weed cover are very rare. The Lower Broken Creek is also listed as a *Wetland of National Significance* as contains many threatened aquatic species and is an important breeding refuge and habitat for many listed and/or migratory waterbirds, especially in times of drought.

The highly modified and cleared surrounding agricultural landscape is a significant barrier to terrestrial faunal movement through the local and broader landscape. The more mobile avifauna and flying foxes, however, still have sufficient habitat at the broader scale to move through the landscape from habitat refuge to refuge. Patches of trees within the study area contribute to a broader area of open woodland which is relatively rare within the local landscape. These trees can serve as stepping-stones for more mobile species such as birds and bats and provide some level of habitat continuity between the nearby: Kinnairds Wetland Reverse, Numurkah Natural Features Reserve, Katunga Bushland Reserve, Black Swamp (Nine Mile Creek) Wildlife Reserve, Numurkah - Picola Rail line Bushland Reserve, Broken-Boosey State Park, Loch Garry Wildlife Reserve (Goulburn River corridor), and Barmah/Murray Valley National Park (Murray River Corridor).

Map 8: 2005 Modelled Ecological Vegetation Classes (EVCs) of the study area.

3.3 Significant Species and Ecological Communities

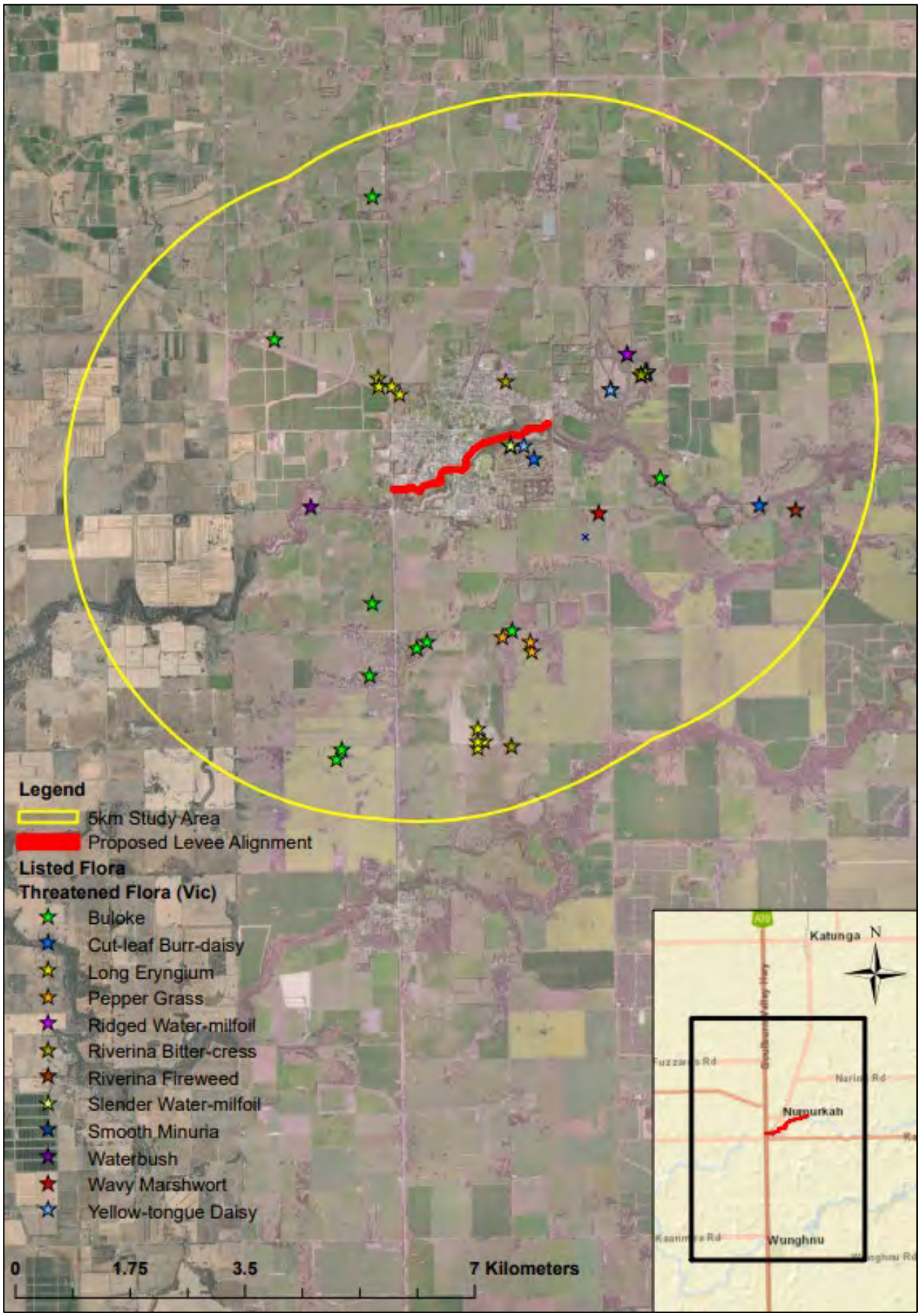
3.3.1 EPBC Act and FFG Act listed species

Lists of EPBC Act and FFG Act listed species recorded or predicted to occur within five kilometres of the study area are provided in **Appendix 1B (flora)** and **Appendix 2B (fauna)**. These species are mapped in **Map 9 (listed flora) and 10 (listed fauna)**. Of all the listed species listed, none were detected within the project impact footprint during surveys. Furthermore, no listed flora are expected to be found on site, attributable to the highly disturbed nature of remaining available habitat.

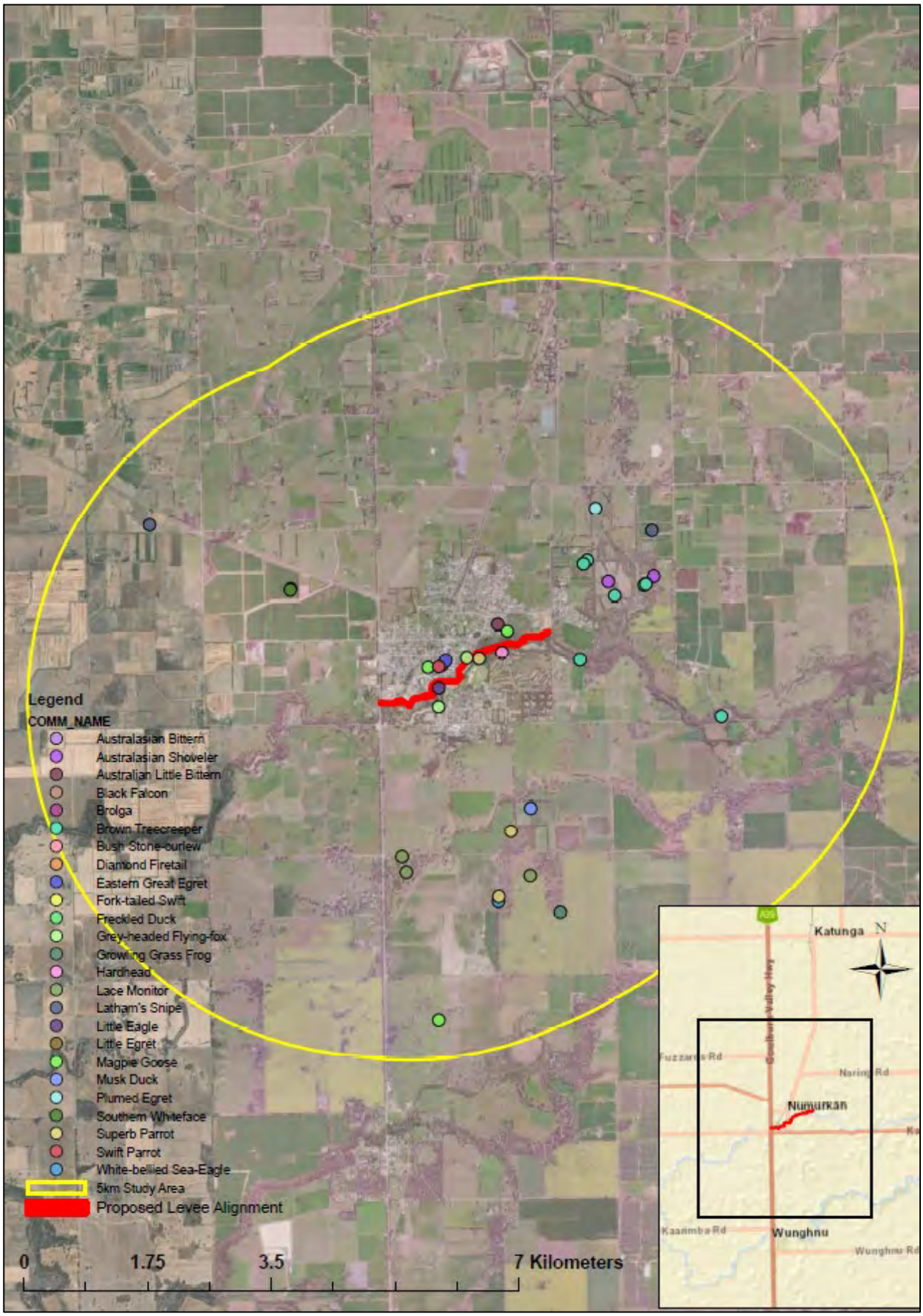
The EPBC Act species listed as having a medium or higher likelihood of occurring in the study area are summarised in **Table 3** and have been individually assessed against the appropriate EPBC Act Significant Impact Criteria (SIC) and associated guidelines (**Appendix 3**). SIC assessments determined that the proposed action is unlikely to have a significant impact on these species. Therefore, a formal referral application under the EPBC Act to the Commonwealth Department of Agriculture, Water and Environment (DAWE) is not required.

Table 2: Summary of listed threatened species (EPBC Act and FFG Act) with a medium or higher likelihood of occurring in the study area.

Scientific Name	Common Name	FFG Act Status	EPBC Act Status	Last Year Observed	Number of records	Areas of value within the study area
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	n/a	Vulnerable	2018	9	Redgum and Grey Box patches of Plains/Plains Grassy Woodland areas adjoining Broken Creek and Lake Numurkah
Lathamus discolor	Swift Parrot	Critically Endangered	Critically Endangered	2018	6	Mature Redgum and Grey Box patches of Plains/Plains Grassy Woodland areas adjoining Broken Creek and Lake Numurkah - All Patches
Polytelis swainsonii	Superb Parrot	Endangered	Vulnerable	2019	2	Mature Redgum and Grey Box patches of Plains/Plains Grassy Woodland areas adjoining Broken Creek and Lake Numurkah - All Patches
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	2020	2	Redgum and Grey Box patches of Plains/Plains Grassy Woodland areas along Broken Creek and Lake Numurkah; also mature exotic planted vegetation with fruit and flowers.



Map 9: Significant listed threatened flora records within a 5-kilometre radius of the project area.



Map 10: Significant threatened fauna records within a 5-kilometre radius of the project area.

3.3.2 FFG Act Listed Species Habitat Importance Assessment

Under the Guidelines, state-wide Habitat Importance Maps (HIM) form the basis for determining the impact of potential native vegetation removal on rare and threatened species listed under the FFG Act (DELWP 2017). There were no FFG Act listed species being impacted beyond their impact threshold to the extent that species-general offsets would be required (i.e. an impact of more than 0.005% of a species' remaining habitat) as listed in the DEECA Native Vegetation Removal Report in **Appendix 6**. The greatest species impact was for Flat-headed Galaxias (*Galaxias rostratus*), for which 0.0009% of the remaining modelled habitat for the species was being affected by the project.

3.3.3 Significant Ecological Communities

The threatened ecological communities (TEC) recorded and/or predicted to occur under the EPBC Act and/or FFG Act within a 10-kilometre radius of the study area are listed in **Table 3 and 4** along with their likelihood of occurrence.

Table 3: Summary of listed EPBC Act threatened ecological communities within a 10-kilometre radius of the study area.

Threatened Ecological Community Name	Status	Likelihood of occurrence in impact zone	Meets the quality threshold	Justification
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Not present	n/a	Not present
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Not present	n/a	Not present
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Likely	No	Due to the degraded quality, the patch (three canopy trees) does not meet the EPBC Act community 'condition thresholds'.
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Not present	n/a	Not present
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Not present	n/a	Not present

Table 4: Summary of possible listed FFG Act threatened ecological communities within a 10-kilometre radius of the study area.

Threatened Ecological Community Name	Status	Likelihood of occurrence in impact zone	Meets the quality threshold	Justification
Grey Box - Buloke Grassy Woodland Community	Listed	Not present	n/a	Due to the degraded quality
Red Gum Swamp Community No. 1	Listed	Not present	n/a	Not present
Victorian temperate-woodland bird community	Listed	Likely/Present	Yes	May irregularly reside, nest, shelter and forage in or move through the study area

The very small patch of Plains Woodland (EVC 803 – 3 canopy trees) in Levee Section 1 could correspond to the FFG Act listed '*Grey Box - Buloke Grassy Woodland Community*', which means all flora that belong to this community that intersect the project footprint are declared protected flora under the FFG Act. As such, any proposed works/activities on public land which might kill, injure or disturb protected native plants must obtain a *Protected Flora Permit* from DEECA prior to works commencing. However, due to the degraded quality of the patch (i.e. three mature Grey Box trees with no native perennial understorey), it does not meet the community condition as described in the FFG-listed descriptions (DELWP 2021).

This area of Plains Woodland (EVC 803) is also affiliated with the endangered EPBC Act listed '*Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia'* TEC. However, due to the degraded quality of the patch proposed to be removed/disturbed within the study area, the patch does not meet the EPBC Act community 'condition thresholds' as described in the listing advice (DAWE 2010). Although it is recognised that patches still retain very important natural values, this means that the protection provisions do not trigger the "significant impact criteria" test of the EPBC Act.

Some areas of Plains Woodland (EVC 803) and Plains Grassy Woodland (EVC 55_61) are likely to contain the FFG Act listed threatened '*Victorian Temperate Woodland Bird Community*' in and around the study area; potentially for the key indicator species: Superb Parrot (*Polytelis swainsonii*), and Swift Parrot (*Lathamus discolor*), all of which are known to occur recently in the project area on an irregular basis (i.e. VBA records within 5 kilometres of project), and one recorded within 200 metres. A range of threatened woodland birds may irregularly reside, nest, shelter and forage in or move through the study area using the remnant trees and those in the neighbouring landscape, however it is considered unlikely to occur on a regular basis within the impact footprint due to absence of suitable habitat, degree of modification, ongoing urban disturbance/threats and/or lack of previous records within the study area.

Nonetheless, efforts have also been made to avoid and minimise woodland tree losses, to avoid better-quality understorey vegetation and to utilise lower quality or devoid areas for impact zones. That is, of the 436 native trees assessed, there are 58 native trees (54 canopy trees and 4 scattered trees) considered lost directly by removal or as consequential loss due to TPZ and/or structural root zone (SRZ) impacts within the development impact footprint. Many lost trees are assumed TPZ losses, however the tree will remain as biodiversity habitat. A CEMP should be developed that mitigates risk to FFG Act-listed fauna during the construction phases of the project. Provided these efforts are followed and the recommendations from this report are adopted, the woodland bird species associated with this TEC are unlikely to be significantly impacted by this proposed project due to their mobility and the presence of more highly suitable habitat nearby. No areas of FFG-listed Red Gum Swamp Community No. 1 were identified within the project impact footprint.

3.4 Other Ecological Values

Areas of Plains Woodland (EVC 803) and Plains Grassy Woodland (EVC 175_61) within the study area represent threatened ecological vegetation community within the Victorian Riverina bioregion, which has a status of endangered under the FFG Act. The Broken Creek is also federally listed in the *Directory of Important Wetlands in Australia* particularly for threatened waterbirds and fish such as Flathead Galaxias (*Galaxias rostratus)*, Macquarie Perch (*Macquaria australasica)* and Murray Cod (*Maccullochella peelii).* It is also upstream of the listed Lower Broken Creek wetland and RAMSAR listed Barmah-Millewa wetlands.

3.5 Further Survey Recommendations

The biodiversity assessment of the of the entire project area was undertaken over two survey efforts by two qualified Red-Gum Environmental Consulting ecologists/botanists between 26 July and 28 August 2023.

This provided high confidence that species for these areas have been adequately captured during the assessment process, even though the bulk of initial assessments were undertaken during a somewhat sub-optimal time of year for conducting surveys. A species list of flora and fauna encountered has been provided, and although it is likely that not all species were captured which may be present, is considered a comprehensive species list for the project study area.

Furthermore, no threatened or significant flora are expected to be found on site, attributable to the disturbed nature of available habitat. These surveys are considered adequate to cover all the relevant significant species likely to require formal assessment under the EPBC and FFG Act, and no further surveys are recommended.

4 Biodiversity Legislation and Government Policy

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

4.1 Commonwealth

4.1.1 Environmental Protection and Biodiversity Conservation Act 1999

The EPBC Act applies to developments and associated activities that can significantly impact MNES protected under the Act. Lists of EPBC Act MNES predicted to occur within ten kilometres of the project footprint are provided in **Appendix 1B (flora)** and **Appendix 2B (fauna)**. These species are mapped in **Map 9 (flora) and 10 (fauna)**. A summary of impacts and recommendations for these MNES relevant to the project are listed in **Table 5.** The EPBC Act species with a medium or higher likelihood of occurring in the study area are summarised in **Table 2** and have been individually assessed against the appropriate EPBC Act Significant Impact Criteria (SIC) and associated guidelines (**Appendix 3**). SIC assessments determined that that these species are unlikely to be significantly impacted, therefore a formal referral application under the EPBC Act is not required.

The area of Plains Woodland (EVC 803) in Levee Section 1 is affiliated with the endangered EPBC Act listed '*Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia'* TEC. However, due to the degraded quality of the patch proposed to be removed/disturbed within the study area (three trees with no understorey), the patch does not meet the EPBC Act community 'condition thresholds' as described in the listing advice (DAWE 2010). That is, <0.5 hectares of patch size and at least 50% of the vegetative cover in the ground layer comprises perennial native species and/or eight or more perennial native species (twelve or more for derived grasslands) are present in the mid and ground layers at any time of the year. This woodland area doesn't retain sufficient conservation values to be considered as a MNES as defined under the EPBC Act. Although it is recognised that patches still retain very important natural values, this means that the protection provisions do not trigger the "significant impact criteria" test of the EPBC Act. A SIC has not been completed as such. Despite this, it is recognised that those patches still retain very important natural values, and efforts are being made to micro-site through these areas and minimise impacts as much as possible.

The study area adjoins the Broken Creek which is listed as in *Directory of Important Wetlands in Australia* a nationally important wetland/floodplain for threatened waterbirds and fish. Therefore, a pre-referral meeting with the Commonwealth Department of Agriculture, Water and Environment (DAWE) is recommended to take place prior to proceeding with a formal referral application under the EPBC Act. The EPBC Act-listed threatening processes that are considered in operation (or may be in operation) within the impact site are listed in **Table 6** and where threats are operating or may be in operation, measures to help ameliorate the risks associated with the threat are outlined.

Table 5: Summary of project in relation to EPBC Act

Matter of National Environmental Significance	Project specifics	Assessment against significant impact criteria
Threatened species	Four listed fauna species have a medium or higher likelihood of occurring in the study area on a regular or permanent basis as per **Appendix 1B and 2B** likelihood assessment and summarised in **Table 2**. No EPBC listed flora species were recorded and are highly unlikely to occur.	The SIC assessments in **Appendix 3** determined that one (1) of the four (4) listed fauna species are considered possible to meet the criteria for being 'significantly impacted' under this Act for Brown Treecreeper (eastern subspecies). Therefore, a pre-referral meeting with the Commonwealth Department of Agriculture, Water and Environment (DAWE) is recommended to take place prior to proceeding with a formal referral application under the EPBC Act. No EPBC listed flora species were recorded and are highly unlikely to occur, owing to the poor quality of the remaining native vegetation, historic site modification and ongoing disturbance of the site.
Threatened ecological communities (TEC)	One listed threatened ecological community has a medium or higher likelihood of occurring in the study area (**Table 3**).	*Grey Box Grassy Woodlands and Derived Native Grasslands of South East Australia* TEC is not considered present due to poor condition and small patch size (3 canopy trees), thus it does not qualify for the condition thresholds as per the TEC's listing advice (DAWE 2010), which means it does not qualify as a MNES and does not trigger the "Significant Impact Assessment" criteria test. Impacts to the patch will not be significant, therefore, no referral is required. Despite this, the patches do have conservation value and impact minimisation is warranted.
Migratory species	10 migratory species have been recorded or predicted to occur within 10km of the project, however all were unlikely to occur in the project footprint on a regular or permanent basis (**Appendix 2B**).	As the waterways and wetland habitat are outside the development impact footprint, there are no EPBC Act migratory species that were considered to have a medium or higher likelihood of occurring on a permanent or regular basis. No referral required as a CEMP will be developed that mitigates risk to waterways/wetlands before, during and after the construction phases of the project.
Wetlands of international importance (RAMSAR sites)	The study area is not directly within the vicinity of RAMSAR-listed wetlands; nonetheless, it is 20-30km upstream of the RAMSAR-listed Barmah-Millewa Wetlands.	No impact likely on any significant RAMSAR wetland. No referral required as a CEMP will be developed that mitigates risk to waterways/wetlands before, during and after the construction phases of the project.
Directory of Important Wetlands in Australia	The study area adjoins the Broken Creek which is listed as a nationally important wetland/floodplain for threatened species, particularly waterbirds and fish.	A pre-referral meeting with the Commonwealth Department of Agriculture, Water and Environment (DAWE) is recommended to take place prior to proceeding with a formal referral application under the EPBC Act. A CEMP should be developed that mitigates

Matter of National Environmental Significance	Project specifics	Assessment against significant impact criteria
		risk to this listed wetland before, during and after the construction phases of the project.

Table 6: EPBC Act Threatening Processes and measures to ameliorate those in operation within the study area.

Threatening Process	Measures to ameliorate the risk
Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (*Manorina melanocephala*)	Noisy Miners are present in significant numbers in the study area. The site is highly modified and largely cleared of native understorey and already fragmented, therefore, the clearance native canopy trees are unlikely to cause a significant change to benefit this species.
Competition and land degradation by rabbits	Rabbits are present in the study area, but in low numbers. Council, in cooperation with adjoining landholders, should employ regular monitoring of rabbit numbers and where numbers increase and/or their damage levels become hazardous, control efforts should be employed.
Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)	There were no obvious areas of dieback within the study area. Monitoring should take place to check for the presence of dieback. Where dieback is detected, tests should be conducted via soil samples sent to AgriBio (LaTrobe University, Bundoora) to determine if the disease is present. If present, efforts should be undertaken to set up an exclusion zone around known infected trees, to prevent the disease spreading to uninfected areas. Further advice may be sought from Agriculture Victoria or DEECA.
Fire regimes that cause declines in biodiversity	Fire regimes in SE Australia are commonly vastly different to pre-European regimes. Efforts need to be undertaken to ensure fires do not occur at close intervals, which is unlikely within the study area. The Construction Environmental Management Plan (CEMP) should outline measures to limit the risk of fires resulting from construction processes and will have contingencies in place to manage any accidental fire incidents in a rapid and effective manner.
Infection of amphibians with Chytrid Fungus resulting in chytridiomycosis	The disease is not known to be present. Equipment involved should be thoroughly decontaminated (washed) prior to arriving on site to reduce the risk of introducing Chytrid Fungus.
Land clearance	The study area being public land is protected from the impacts of further non-permitted clearing; however, illegal cutting of firewood may be a risk. Council may need to monitor for illegal wood cutting and consult with DEECA if losses are found. The project involves native vegetation removal and only those areas and trees marked for removal are to be impacted by construction works. Any impacts beyond this, or accidental losses, must be communicated to DEECA and addressed as per DEECA's advice.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Garden escapees are spreading within the study area given the closeness to urban residential areas. Efforts are to be made to ensure no garden escapes or their propagules (seeds, fruits etc) are spread during construction works. Machinery and equipment being used for the development must arrive on site clean and propagule free. In the event machinery enters an infested area, the machinery must be thoroughly cleaned down prior to moving to another part of the study area. Agriculture Victoria can provide advice on appropriate clean-down methods depending on the weed species being dealt with.
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	It is likely that climatic influences are occurring in the study area. The project CEMP will detail measures to help minimise greenhouse gas emissions that are involved with the construction process.
Novel biota and their impact on biodiversity	New species introductions are uncommon, however human movement and development projects have contributed over the years to significant change to receiving environments from intentional and accidental species introductions. The CEMP will detail measures to ensure the likelihood of species introductions will be reduced during construction and rehabilitation efforts.
Predation by European Red Fox	Fox predation is a significant issue throughout SE Australia. Council, in cooperation with landholders, should undertake regular fox control efforts to protect native species from the impacts of fox predation.
Predation by feral Cats	Feral Cat predation is a significant issue throughout SE Australia. Council, in cooperation with landholders, should undertake regular cat control efforts to protect native species from the impacts of predation.

4.2 State

4.2.1 Flora and Fauna Guarantee Act 1988

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 (DEECA 2023b, 2023c and 2023d). No FFG Act-listed species were detected within the project impact footprint and immediate areas during surveys; however, a total of three FFG Act-listed species had a medium or higher likelihood of occurring in the study area and are summarised in **Table 2** (with their likelihood assessment in **Appendix 1B and 2B)** and mapped in **Map 9 and 10**.

Possible FFG Act-listed threatened ecological communities within a 10-kilometre radius of the study area are listed in **Table 4**. Some areas of Plains Woodland (EVC 803) and Plains Grassy Woodland (EVC 55_61) are likely to contain the FFG Act listed '*Victorian Temperate Woodland Bird Community*' TEC in and adjacent to the impact area, potentially containing habitat for the key community indicator species: Superb Parrot (*Polytelis swainsonii*), and Swift Parrot (*Lathamus discolor*). Both these species are irregularly known to occur recently in the project area (i.e. VBA records within 5 kilometres of project), with one recorded within 200 metres. A range of other threatened woodland birds may irregularly reside, nest, shelter and forage in or move through the study area and neighbouring landscape, however they are unlikely to occur on a regular basis due to lack of suitable habitat given poor site condition, urban modification, disturbance and threats, and lack of records in the broader local area. That is, overall impacts won't significantly impact the TEC given the habitat disturbance levels already present. Nonetheless, many efforts have been made to avoid and minimise woodland bird habitat losses i.e. to avoid better-quality vegetation patches and to utilise lower quality or devoid areas for impact zones. The proposed trees losses include many assumed tree losses based on TPZ impacts, however, these trees will remain as woodland habitat by being left standing, as they occur outside the impact zone. A CEMP will be developed that mitigates risk to FFG Act-listed fauna during the construction phases of the project. Provided these efforts are followed and the recommendations from this report are adopted, the habitat availability and woodland bird species associated with this TEC are unlikely to be significantly impacted by this proposed project.

Under the FFG Act, a permit is required from DELWP to 'take' protected flora species from public land. That is, works or other activities on public land, which may affect protected native plants, will require a *Protected Flora Permit* under the FFG Act. While no FFG-listed significant flora species were detected within the project footprint, a small patch of Plains Woodland (EVC 803) in Levee Section 1 could correspond to the FFG Act listed significant ecological community '*Grey Box - Buloke Grassy Woodland Community*', which means all flora that belong to this community that intersect the project footprint are considered protected under the FFG Act and therefore will require a permit for removal. However, due to the very degraded quality and small size of the patch (only three contiguous mature Grey Box trees with native perennial understorey), it does not meet the described/listed FFG Act community conditions, therefore does not warrant a *Protected Flora Permit* under the FFG Act (DELWP 2021). Other protected flora species that require a permit include all Wattle *Acacia* species onsite (excluding *Acacia dealbata, Acacia decurrens, Acacia implexa, Acacia melanoxylon,* and *Acacia paradoxa*) (**Appendix 1A**).

4.2.2 FFG Act Public Authority Duty

Section 4G of the FFG Act now requires ministers and public authorities to consider the FFG Act when performing functions that might impact upon Victoria's biodiversity. Other matters to be considered include the Biodiversity Strategy, species action statements, management plans or critical habitat determinations. Impacts on biodiversity to be considered include long and short-term impacts, direct and indirect impacts, cumulative impacts, and the impacts of threatening processes.

Moira Shire Council is a public authority and therefore the FFG Act Public Authority Duty applies to this project. There must be a reasonable expectation of biodiversity impacts for the duty to be relevant to an authority's functions. This assessment and report are considering the impacts to biodiversity on the authority's (Council's) behalf; however the findings and recommendations of this report should be reviewed by Council to ensure they are satisfied with the assessment of biodiversity impacts and the recommendations being put in place to minimise impacts to biodiversity that result from the project.

FFG Act Threatening Processes

FFG Act Listed threatening processes which may be in operation within the study area are listed in **Table 8** and where threats are operating or may be in operation, measures to help ameliorate the risks associated with the threat and the proposed development are outlined.

Table 8: FFG Act Threatening Processes and measures to ameliorate those in operation (or may be in operation) within the study area.

Threatening Process	Measures to ameliorate the risk
Inappropriate fire regimes causing disruption to sustainable ecosystem processes and resultant loss of biodiversity	Fire regimes in SE Australia are commonly vastly different to pre-European regimes. The CEMP will outline measures to limit the risk of fires resulting from construction processes and will have contingencies in place to manage any accidental fire incidents in a rapid and effective manner.
Increase in sediment input into Victorian rivers and streams due to human activities	The CEMP will detail actions to ensure erosion and sedimentation associated with the proposed works are appropriately controlled and monitored to mitigate the risk to waterways/wetlands during the construction phases of the project.
Infection of amphibians with Chytrid Fungus, resulting in chytridiomycosis	The disease is not known to be present. Equipment involved with the construction works needs to be thoroughly decontaminated (washed) prior to arriving on site, to reduce the risk of introducing Chytrid Fungus.
Invasion of native vegetation by Blackberry *Rubus fruticosus* L. agg	Blackberry was detected within the study area and should be monitored for and controlled.
Invasion of native vegetation by environmental weeds	There are several environmental and noxious weeds within the study area. This report and the CEMP should outline measures to ensure the proposed construction works do not introduce weed species or spread weed species during construction works.
Loss of coarse woody debris from Victorian native forests and woodlands	Historically, woody debris levels have been reduced in the study area because of human activity, in particular firewood collection and inappropriate fire regimes. Council should monitor for illegal activity and act if wood removal is in operation.
Loss of hollow-bearing trees from Victorian native forests	Loss of hollow-bearing trees may have occurred in the past. Through iterative designs of the proposed project, tree losses and native vegetation impacts have been significantly reduced and large mature hollow-bearing trees have been avoided where possible or offset.
Loss of terrestrial climatic habitat caused by anthropogenic emissions of greenhouse gases	It is likely that climatic influences are occurring in the study area, although these are inherently difficult to identify and quantify. The project CEMP will detail measures to help minimise greenhouse gas emissions that are involved with the construction process.
Predation of native wildlife by the cat, *Felis catus*	Feral cat predation is a significant issue throughout SE Australia. Council, in cooperation with landholders, should undertake regular cat control efforts to protect native species from the impacts of predation.
Predation of native wildlife by the introduced red fox *Vulpes vulpes*	Fox predation is a significant issue throughout SE Australia. Council, in cooperation with landholders, should undertake regular fox control efforts to protect native species from the impacts of fox predation.

Threatening Process	Measures to ameliorate the risk
Reduction in biodiversity resulting from Noisy Miner (*Manorina melanocephala*) populations in Victoria	Noisy Miners are present in significant numbers in the study area. The site is highly modified and largely cleared of native understorey and already fragmented, therefore, the clearance native canopy trees are unlikely to cause a significant change to benefit this species. A trapping program should be explored within the township.
Reduction in biomass and biodiversity of native vegetation through grazing by the rabbit *Oryctolagus cuniculus*	Rabbits are present in the study area, but in low numbers. Council, as the land manager, should employ regular monitoring of rabbit numbers and where numbers increase and/or their damage levels become hazardous, control efforts should be employed.
The introduction and spread of the large earth bumblebee *Bombus terrestris* into Victorian terrestrial environments	The development is highly unlikely to be implicated in the introduction of this species into the local environment as part of the proposed works.
The spread of *Phytophthora cinnamomi* from infected sites into parks and reserves, including roadsides, under the control of a state or local government authority	There were no obvious areas of dieback within the study area. Monitoring should take place to check for the presence of dieback. Where dieback is detected, tests should be conducted via soil samples sent to AgriBio (LaTrobe University, Bundoora) to determine if the disease is present. If present, efforts should be undertaken to set up an exclusion zone around known infected trees, to prevent the disease spreading to uninfected areas. Advice may be sought from Agriculture Victoria or DEECA.
Threats to native flora and fauna arising from the use by the feral honeybee *Apis mellifera* of nesting hollows and floral resources	The incursion of nesting hollows by feral honeybee populations is a common problem throughout SE Australia. Applications from apiarists to use floral resources within the study area need to be carefully considered by Council. The project is not likely to contribute to this threatening process.
Use of *Phytophthora*-infected gravel in construction of roads, bridges and reservoirs	The source of gravel and soil used for construction needs to be verified as being *Phytophthora*-free. Vehicles and equipment must arrive on site in a clean condition and any vehicles or equipment that may have been in a *Phytophthora* infected area must be appropriately decontaminated with a suitable decontaminant, such as Phytoclean or similar.

4.2.3 Planning and Environment Act 1987

The *Planning and Environment Act 1987* (P and E Act) governs the planning framework for the use, development and protection of land in Victoria. The P and E Act provides procedures for the preparation and amendment of the Victoria Planning Provisions and planning schemes. The Act also provides avenues for the acquisition and compliance of permits under local planning schemes.

4.2.4 Land Tenure

The project occurs mainly within public crown land which is designated as park and recreation reserves and/or road reserves and is managed by Moira Shire Council LGA, as shown in **Map 12 and 13** and **Table 9**.

4.2.5 Planning Scheme Zones and Overlays

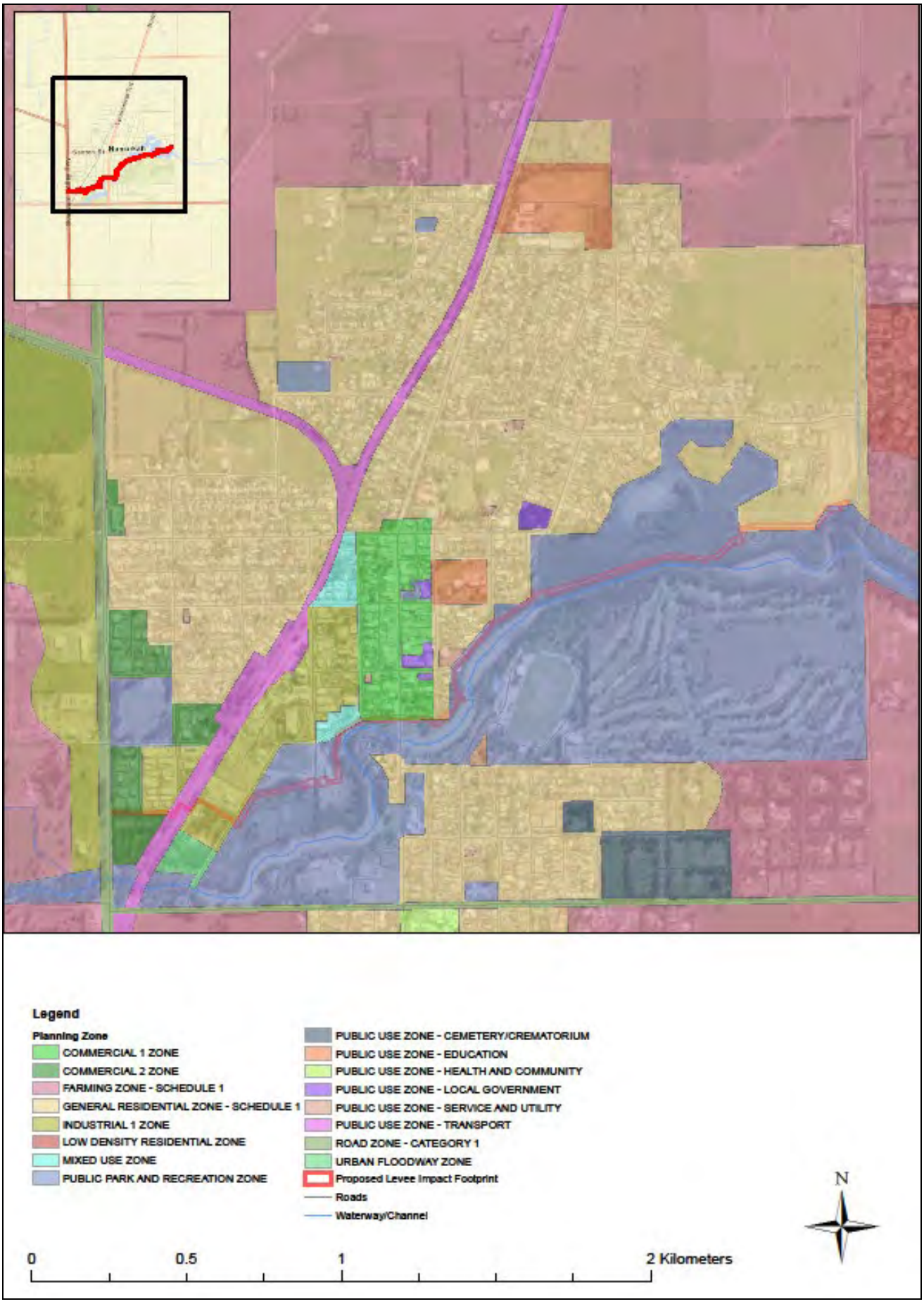
There are several different planning zones and overlays across the study area as shown in **Map 12 and 13** and **Table 9**. Most of the study site is covered by a *Rural Floodway* overlay and *Land Subject to Inundation* overlay and will need to demonstrate compliance with the requirements. No Environmental Significance Overlays, Vegetation Protection Overlays, Significant Landscape Overlays and/or Erosion/Salinity Overlays occur across the project impact area.

Table 9: Parcel and planning details

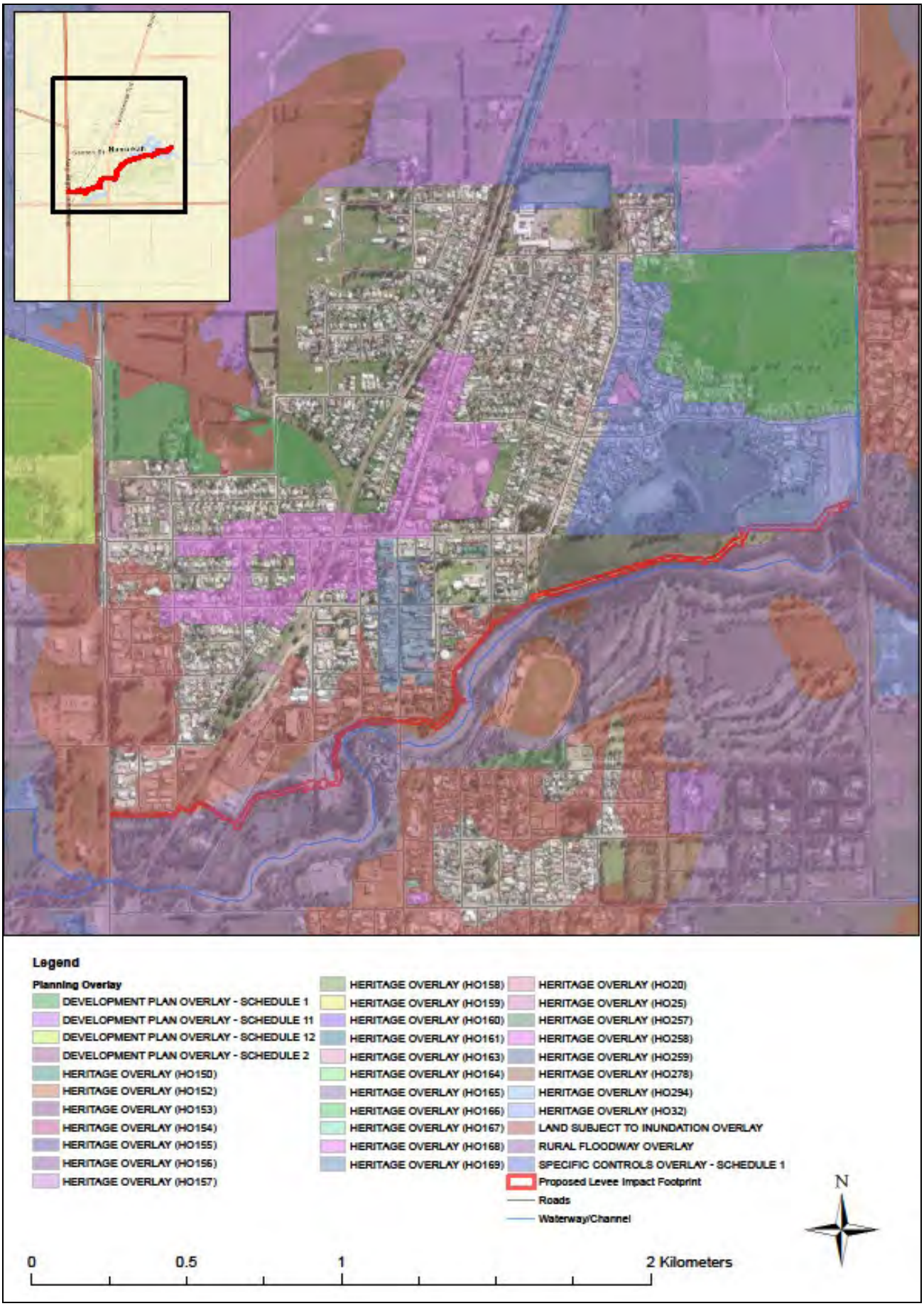
Section	Lot/Parcels	Planning zones	Planning overlays
1	• Road Reserve • Railway Reserve 16~36\PP5607	• COMMERCIAL 2 ZONE • INDUSTRIAL 1 ZONE • PUBLIC USE ZONE - TRANSPORT	• LAND SUBJECT TO INUNDATION OVERLAY
2	• 2025\PP5607 • 6A~40\PP5607 • 5~40\PP5607	• PUBLIC PARK AND RECREATION ZONE • MIXED USE ZONE • COMMERCIAL 1 ZONE	• RURAL FLOODWAY OVERLAY • LAND SUBJECT TO INUNDATION OVERLAY
3	• 2~35\PP5607 • 9~34\PP5607	• PUBLIC PARK AND RECREATION ZONE • COMMERCIAL 1 ZONE • GENERAL RESIDENTIAL ZONE - SCHEDULE 1	• RURAL FLOODWAY OVERLAY • LAND SUBJECT TO INUNDATION OVERLAY • HERITAGE OVERLAY
4	• 9~34\PP5607 • 8~34\PP5607	• PUBLIC PARK AND RECREATION ZONE	• RURAL FLOODWAY OVERLAY • LAND SUBJECT TO INUNDATION OVERLAY • HERITAGE OVERLAY
5	• 9~34\PP5607 • 2034\PP5607 • Road Reserve	• PUBLIC PARK AND RECREATION ZONE • GENERAL RESIDENTIAL ZONE - SCHEDULE 1	• RURAL FLOODWAY OVERLAY • SPECIFIC CONTROLS OVERLAY – 1 (GMW)

The development of land in Victoria is managed through the PE Act and through the integrated Planning Schemes of local governments right across Victoria. In relation to this development, the State Planning Policy Framework (*Victoria's Native Vegetation Management: A Framework for Action*) aims for a "*Reversal, across the entire landscape, of the long-term decline in the extent and quality of native vegetation, leading to a net gain*" (DSE 2011).

As native vegetation occurs within the study site, there is a requirement for a planning permit to remove native vegetation as detailed in the *Particular Provision: Clause 52.17 - Native vegetation* of the local planning scheme. In all instances where a planning permit is required under this clause, the Guidelines and the three-step approach outlined in **Section 5** must be applied.



Map 12: Study area planning zones – All Levee Sections.



Map 13: Study area planning overlays - All Levee Sections.

4.2.6 Planning Policy Framework

There are several environmental clauses in the Planning Policy Framework (PPF) which may apply to the project and will need to be specifically addressed including:

- **Clause 12.03-1S:** Waterbodies and Wetlands.
- **Clause 13.03-1S:** Floodplain Management
- **Clause 13.03-1L:** Floodplain Management in Moira
- **Clause 13.04-2S:** Erosion and landslip.
- **Clause 14.02-1S:** Catchment Planning and Management.
- **Clause 14.02-2S:** Water Quality.

4.2.7 Environmental Protection Act 2017

The purpose of the *Environmental Protection Act 2017* (EP Act) is to prevent and minimise the risks to the environment and human health from pollution sources and waste disposal. The project has been designed in a manner that minimises as much native vegetation impact as possible without comprising the project's effectiveness, and utilises existing disturbed areas wherever possible, significantly reducing the project's impact on the receiving environment.

The project CEMP will outline management actions that are to be undertaken to protect the local environment from impacts from development, such as noise pollution controls, dust controls, vibration controls, light pollution controls, spills and leak controls, no-go areas, erosion and sedimentation controls and wetland/water protection.

4.2.8 Environment Effects Act 1978

The *Environmental Effects Act 1978* (EE Act) provides for an assessment of proposed projects that can have a significant effect on the environment. Projects that trigger the referral criteria must be referred to the Minister administering the EE Act to decide if an Environmental Effects Statement (EES) should be prepared (DSE 2006).

The proposed project has been assessed against referral criteria and identifies the following potential ecological triggers for the project (DSE 2006):

- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in '*A Directory of Important Wetlands in Australia*';
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term; and
- Potential extensive or major effects on the health, safety or well-being of a human community, due to emissions to air or water or chemical hazards or displacement of residences.

None of the identified potential impacts will occur at a magnitude to be considered a potential ecological referral trigger under the EE Act (see **Table 13)**. This is based on the project's existing policy safeguards and standards and proposed adherence to a CEMP and Sediment and Erosion Control Management Plan (SECMP) before, during and after the construction phase. Nonetheless, Moira Shire can choose to self-refer this project under the EE Act to attain legal certainty.

Table 13: Assessment of the project against the EE Act referral criteria - Individual Type Effects

EE Act Referral Criteria	Assessment of the Criteria
Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'	The project directly abuts the Broken Creek which is listed in the 'Directory of Important Wetlands in Australia' and is located 20-30km upstream of the Barmah and NSW Forest RAMSAR wetlands. The project will not cause long-term change to the ecological character of listed wetlands, based on the project's existing policy safeguards, standards and proposed adherence of a CEMP and SECMP before, during and after the construction phase, to ensure protection of the waterways and wetlands (as listed in **Table 20**).
Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term	As above. The project will not cause long-term extensive or major effects on the health or biodiversity of aquatic ecosystems based on the project's existing policy safeguards, standards and proposed adherence of a CEMP and SECMP before, during and after the construction phase to ensure protection of the waterways and wetlands (as listed in **Table 20**).
Potential extensive or major effects on the health, safety or well-being of a human community, due to emissions to air or water or chemical hazards or displacement of residences	No negative effects are forecasted for the health, safety or well-being of a human community based on the project's existing policy safeguards, standards with proposed adherence of a CEMP and SECMP before, during and after the construction phase to ensure protection from emissions to air or water or chemical hazards.

4.2.9 Water Act 1989

The Water Act 1989 regulates the management and use of all water under the control of the Crown in Victoria. The Act provides water authorities with a range of enforcement powers and imposes obligations on persons and organisations not to interfere with assets of water authorities, waterways and water.

Goulburn Broken Catchment Management Authority (GBCMA) is the responsible authority for the control, management and authorisation of works and activities in or over designated waterways in the study site. Approval via a works on waterways permit from GBCMA will be required for construction activities within 30 metres of the watercourses within the study site, including the Broken Creek and Lake Numurkah.

4.2.10 Catchment and Land Protection Act 1994

The *Catchment and Land Protection Act 1994* (CaLP Act) is the key legislation governing the management and classification of noxious weeds and pest animals throughout Victoria (Agriculture Victoria 2023). The Act requires the management listed weeds and pest animals including the prevention of spread, direct management or in some instances eradication of regionally prohibited or controlled weeds and pest animal species on the land (Agriculture Victoria 2021). Nine declared noxious weed species and one pest animal species were observed during the site assessments (see **Appendix 1A and 2A)**. Moira Shire is required to ensure that the proposed works aim to prevent the growth and spread of noxious weed species and pest animals during all stages of construction. It is recommended that a suitably prepared CEMP is developed by Council and the contractor to ensure appropriate risk management measures are implemented before, during and after construction works, to ensure compliance with the broader objectives of the CaLP Act.

4.2.11 Wildlife Act 1975 and Wildlife Regulations 2013

The *Wildlife Act 1975* and *Wildlife Regulations 2013* are both Victorian legislation which prevent harm to native wildlife. A permit is required under the *Wildlife Act 1975* to carry out field investigations for the purpose of conserving, monitoring, improving or maintaining wildlife habitat within Victoria. This also includes the salvage and translocation of wildlife from a particular locality which requires a specific *Wildlife Act 1975* permit (authorised by DEECA) for the capture, handling and relocation of wildlife.

Any works requiring the removal or relocation of wildlife within or adjoining the study site should be undertaken by suitably qualified and licenced personnel and outlined in the CEMP. Appropriate mitigation measures must be employed during the vegetation removal, such as pre-clearance checks of vegetation being felled/removed, directional clearing towards areas of remaining habitat where applicable, and suitable protocols and contingency measures to manage any injured or displaced fauna during construction.

4.2.12 Fisheries Act 1995

The Fisheries Act 1995 provides a legislative framework for the regulation, management and conservation of Victorian fisheries including aquatic habitats. A person must not take, injure, damage, destroy or release any protected aquatic biota. Protected aquatic biota includes any fish or aquatic invertebrate or community that are listed under the FFG Act. Providing that none of wetlands in the study area are impacted the potential for protected aquatic biota to be injured, damaged or destroyed is considered to be negligible and no permit is required from DECCA.

4.2.13 Environment Protection Act 1970: State Environmental Protection Policy (Waters) 2018

The Environment Protection Act underpins the SEPP (Waters) which provides a legal framework for the protection and management of Victoria's water environments, including surface waters, estuarine and marine waters and groundwater. The project may directly and/or indirectly impact upon wetlands and two drainage lines within the study area and their aquatic ecosystems. The SEPP requires that aquatic ecosystem values be protected. Environmental quality objectives and indicators are defined to protect beneficial uses (i.e. the uses and values of the water environment) and an attainment program provides guidance on protection of the beneficial uses. Impacts to surface water quality must not result in changes that exceed background levels and/or the water quality objectives to protect surface water values. Council needs to ensure that direct and indirect (e.g. runoff) impacts to surface water quality do not exceed the background levels and/or water quality objectives. Link to further information: https://www.epa.vic.gov.au.

5 Victoria's 'Guidelines for the Removal, Destruction or Lopping of Native Vegetation'

This section addresses the proposed native vegetation impacts associated with the project permit application. A permit is required to remove native vegetation on the site as outlined in the Native Vegetation clause 52.17 of the planning scheme and detailed in 'Guidelines for the Removal, Destruction or Lopping of Native Vegetation' (the Guidelines) (DELWP 2017). The purpose of clause 52.17 and the Guidelines is to ensure a no net loss to biodiversity as a result of removal or loss of native vegetation. This is achieved in three steps:

1. Avoid the removal, destruction or lopping of native vegetation;
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided; and
3. Provide an offset to compensate for the biodiversity impact from the removal, destruction or lopping of native vegetation.

In accordance with the Guidelines, an application to remove native vegetation must clearly demonstrate that no options exist to further avoid and minimise the impacts of native vegetation removal, that will not undermine the objectives of the proposed use or development (DELWP 2017).

5.1 Avoid and Minimise Statement

The following avoid and minimise statement has been developed in accordance with the decision guidelines outlined in Table 2, page 17 of the *Assessor's Handbook for Applications to Remove, Destroy or Lop Native Vegetation* (DELWP 2018).

The proposed project footprint has been designed to impact the smallest area possible to avoid and minimise native vegetation and biodiversity impacts, while still being sufficient to achieve the objectives of the project proposal. This process was iteratively undertaken since the first field visit to facilitate a design that:

- Avoids as much native vegetation (trees, native grass, shrubs etc) as possible.
- Wherever possible, avoids the loss of trees, especially large old trees (according to large tree dimensions in the relevant EVC benchmark).
- Minimises the amount of damage to TPZ and SRZ of all trees greater than three metres in height, such that less than 10% of that calculated TPZ area is impacted by the works.
- Ensures the alignment of the project footprint is positioned in areas that have already been subject to disturbance and are largely devoid of native vegetation; and where this is not possible, find areas of lower quality native vegetation.

From the initial assessments, several levee sections were subsequently altered via realigning the section to achieve the least biodiversity impacts (such as in areas of regularly slashed/mown native grass patches of low diversity, or in areas dominated by non-native grasses and weeds) or altering the construction method from the larger impact area of mounded-earth levees to the smaller impact area of concrete levee walls. These alignment changes and all avoidance and minimisation attempts are further described in detail below (**Section 5.1.1** to **5.1.5)** with site photos in **Appendix 5**). These efforts ultimately mean the the proposed project footprint has been considered and altered to the point it now impacts the smallest area possible and the least biodiversity values possible, without impacting on the viability or purpose of the project, to ensure the town is able to be protected from major flooding events into the future.

Based on recommendations from the project arborist, sensitive construction measures are considered unlikely to cause tree decline where TPZ encroachment occurs, provided the project adheres to the Tree Protection Management Plan (**Appendix 9**). All trees in and within proximity to the loss zone have been mapped (i.e. within 20 metres). An arborist has assessed all trees within proximity to the works zone to assess their likelihood of survival based on the type of works in their immediate vicinity, and the final losses have been based on this arborist assessment and report (**Appendix 9**). Much of the native vegetation removal for the project are tree losses that are 'assumed losses' from TPZ or SRZ breaches, and all efforts are being made to retain trees, even when considered lost under the Guidelines. The following strategies are to be implemented to minimise the impacts of the operation on surrounding native vegetation:

- All personnel involved with any development on the site are to be 'tool-boxed' on the importance of minimising their impact on retained vegetation, the adherence to the defined extent of works areas, protection of retained (no-go) areas, and any other permit conditions. The tool-box talks are also to include provisions such as avoiding work in the TPZs of trees on site and processes to report any significant finds (biodiversity or cultural) during construction.
- The construction method and type of machinery selected to be used on the project is to be cognisant of the narrow construction footprint (three metres either side of the levee) and the loss zone is to always be the main construction corridor employed for vehicle movements and other construction activity.
- All trees for removal must be identified and clearly marked to ensure that there is no confusion between trees being removed/retained, and maps showing these features must be clearly displayed in the CEMP and other work plans.
- Avoid excavation within TPZ/SRZ, and instead use small volumes of clean fill to create a level surface for the levee without disturbance being made to tree or shrub roots, where possible.
- Machinery to be used on the project shall be thoroughly cleaned before entering the site to remove all seeds of invasive weeds and non-natives that could invade the site. Consideration is also to be given to diseases such as Cinnamon Fungus (*Phytophthora*), which may be present on machinery and equipment coming onto site, and if suspected, must be dealt with appropriately. Advice on this may be sought from DEECA or Agriculture Victoria.
- The site extent will be clearly defined, as will retained vegetation and other no-go areas, prior to the construction period commencing and barriers/signage will remain in place until works are completed.
- Any noxious or serious environmental weeds within the loss area will be sprayed or mechanically removed before works commence and follow up monitoring and control of weeds must take place for at least 12 months after construction is completed, ideally for even longer given the volumes of soil and resultant bare ground involved with the project.

The following section outlines how the original proposal was assessed and gradually scaled back or altered based on findings from the field. Levee sections are described and the efforts to avoid and minimise native vegetation impacts in these sections are explained and shown visually in maps with section photos in **Appendix 5**.

5.1.1 Levee Section 1 - Goulburn Valley Highway/Needham Street to Station Street

Levee Section 1 attempts to avoid native vegetation impacts by aligning with already disturbed road verge on the southern side of Needham Street, which is dominated by regularly mown exotic grasses with a neighbouring row of exempt planted mature non-endemic canopy species. Originally, the alignment proposed to remove twenty-four native Grey Box trees including five large trees; however this was reduced to only four trees by realigning the section at the southern end of Nelson Street and the railway reserve crossing-point to avoid TPZs. Two scattered large trees and two large trees within a patch (with no understorey vegetation) could not be avoided even though alternatives were considered. These alternatives caused greater strategic biodiversity values impacts being closer to the Broken Creek and other areas of native vegetation patches (**Map 15A**).

5.1.2 Levee Section 2 - Station Street to Melville Street

The eastern half of Levee Section 2 attempts to avoid native vegetation impacts by aligning with the already disturbed and void of native vegetation areas along an existing gravel footpath, consisting of mown verges within a recreation/community use parkland area and council depot areas for much of the section. Patches of mature non-indigenous vegetation have been planted and can be cleared without a Planning Permit as an exemption under Clause 52.17 of the Local Planning Provisions (DELWP 2017), however all efforts are to be made to avoid tree removals where possible.

After the depot, the original levee alignment proposed to remove eleven native trees within a patch of 0.3 hectares directly abutting Broken Creek; however this was minimised/reduced to seven trees within two patches totalling 0.2 hectares (with no understorey) by moving the alignment further north away from the creek edge and reducing the levee width impact footprint by using a narrower concrete wall with steeper bank rather than the wider mounded levee option. The levee alignment attempts to avoid native vegetation and biodiversity impacts by aligning further north to Brenion Street, away from Broken Creek. Within the GF Harding Park, west of Melville Street, there is exotic non-indigenous planted tree/shrub species over mown Kikuyu (*Pennisetum clandestinum*) lawns and rose gardens, which is exempt from a removal permit as it is all non-indigenous vegetation (**Map 15B**).

5.1.3 Levee Section 3 - Melville Street to Numurkah Lake Carpark on Quinn Street

From Melville Street, the levee alignment continues to minimise and avoid native vegetation impacts by initially being placed further north in the already-disturbed non-native parkland and bitumen roadside verge areas toward Brenion Street. Then along Gray Street it is aligned away from the Broken Creek where there is no native understorey. Then by aligning the levee on the existing gravel/concrete footpath adjacent the creek, impacts to native vegetation were avoided. The impact footprint was also reduced by using a narrower concrete wall design (seven metres wide) rather than the wider mounded levee design option (which otherwise would need at least twelve metres of width) and using minor realignments to circumvent native tree TPZs where possible. In this section, of the 106 native trees assessed within 15 metres of the proposed impact footprint, 14 native trees within seven patches (totalling 0.3 hectares) are proposed to be lost; however half of these trees do not require physical removal and will be retained/avoided regardless of impacts, for ongoing biodiversity and bank stability benefits (**Map 15C**).

5.1.4 Levee Section 4 – Lake Numurkah Path West

Levee Section 4 continues to minimise native vegetation impacts by aligning on the existing centrally located five-metre-wide gravel footpath with predominantly mown exotic lawn verges in the parkland between Lake Numurkah and Broken Creek. Of the 228 canopy trees assessed, 24 trees will be lost within seven patches of native vegetation (totalling 0.67 hectares); with only 5 of these trees requiring physical removal with the other 9 trees being retained for ongoing biodiversity and bank stability benefits, despite being considered lost (**Map 15D**).

5.1.5 Levee Section 5 - Lake Numurkah Path East

Levee Section 5 attempts to avoid and minimise native vegetation impacts by aligning with the northern reserve boundary further away from the Broken Creek riparian edge, in areas with little native canopy species and/or disturbed areas that are void of native vegetation and with lower strategic biodiversity value scores (**Map 15E**). Efforts were also made to move the levee alignment into the already disturbed subdivision site at the Kinnards Road end of the project footprint, to avoid Tree Protection Zones of large trees in that area. Of the 51 trees assessed within 20 metres of the levee impact footprint, eight small to medium trees will be lost within two patches of native vegetation (totalling 0.37 hectares) and a number of large trees were saved from impacts.

5.2 Proposed Native Vegetation Removal

The extent of native vegetation patches and scattered trees were mapped and the condition was assessed in relation to standard methods provided by the *Vegetation Quality Assessment Manual* (VQAM - DSE 2004), Appendix 6 of the Assessors Handbook (DELWP 2018) and the relevant EVC benchmarks (DEECA 2023d). The assessments were undertaken by accredited assessors from Red-Gum Environmental Consulting Pty Ltd (Damian Wall, Charley Schulz and Katherine Hill).

The proposed removal of native vegetation was assessed in accordance with the final levee alignment design approved by the client (**Map 1 to 7**). Proposed native vegetation removal and retention is mapped in **Map 15A to 15E** and removal is summarised below in **Table 15,** with photos of the proposed native vegetation losses in **Appendix 5**. No past removal of native vegetation has occurred in the project footprint within the previous five-year period, and losses only include proposed losses associated with this project. All native vegetation beyond the impact zones (loss area) is being retained/avoided. Any unmapped vegetation was planted vegetation, or of inappropriate/non-endemic species, or was situated more than 15 metres from the impact footprint.

An NVR report for the project was obtained from DEECA using the site condition scores from the native vegetation assessment and it provides details of the native vegetation losses and offset requirements. This report is provided in **Appendix 6** and is summarised in the following sections. The final levee alignment design proposes to remove 1.857 hectares of endangered native vegetation from the Victorian Riverina bioregion, comprising patch vegetation, canopy trees and scattered trees (**Map 15A to 15E**) from two EVCs:

- Plains Woodland (EVC 803 – Endangered)
- Plains Grassy Woodland (EVC 55_61 - Endangered).

The removal of this native vegetation will result in the removal of:

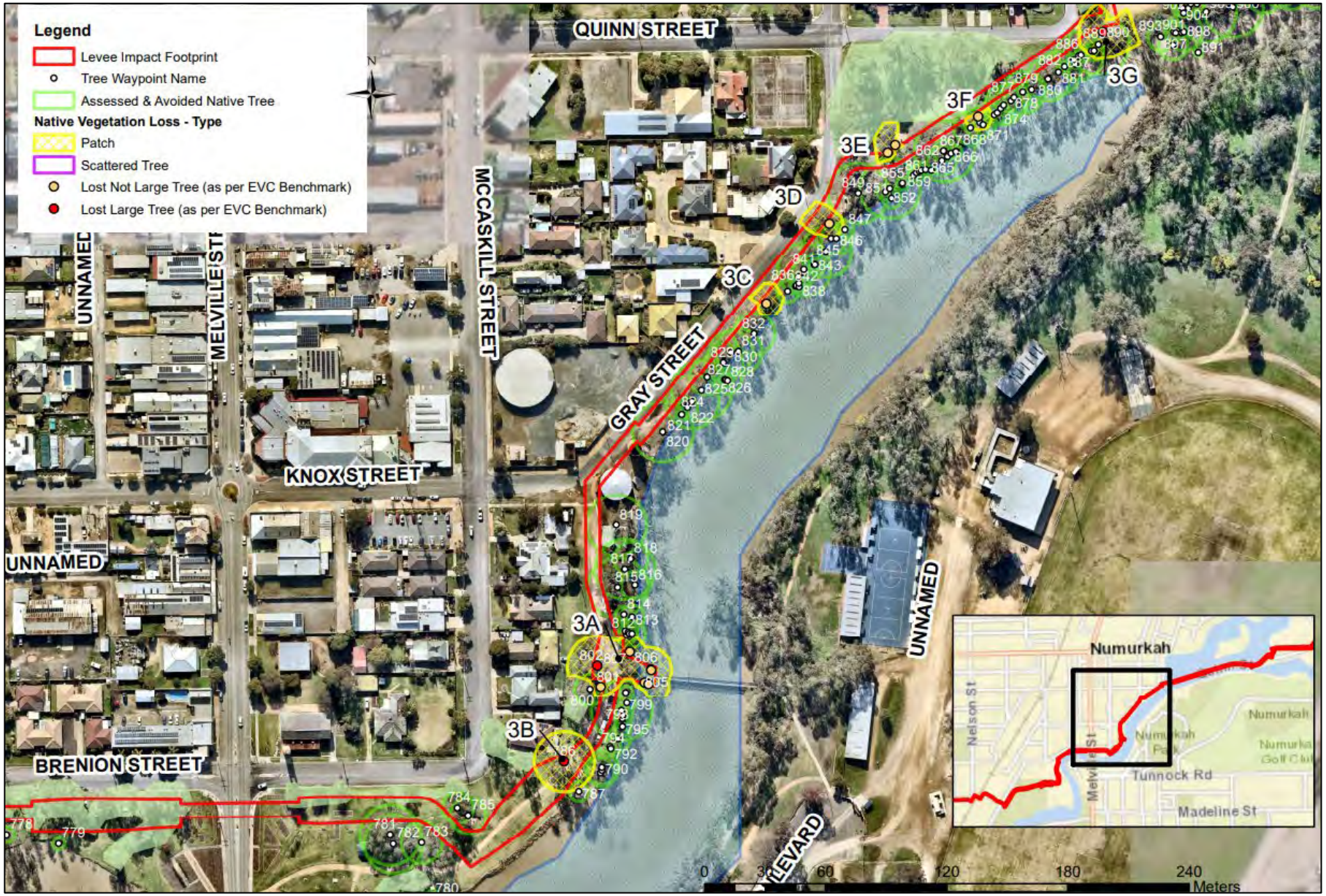
- 23 patches (across 6 habitat zones totalling 1.6 hectares).
- 55 native canopy trees (within patches) including 19 large trees and 35 small trees.
- Four native scattered trees including three large trees and one small tree.

Table 15: Native vegetation removal details.

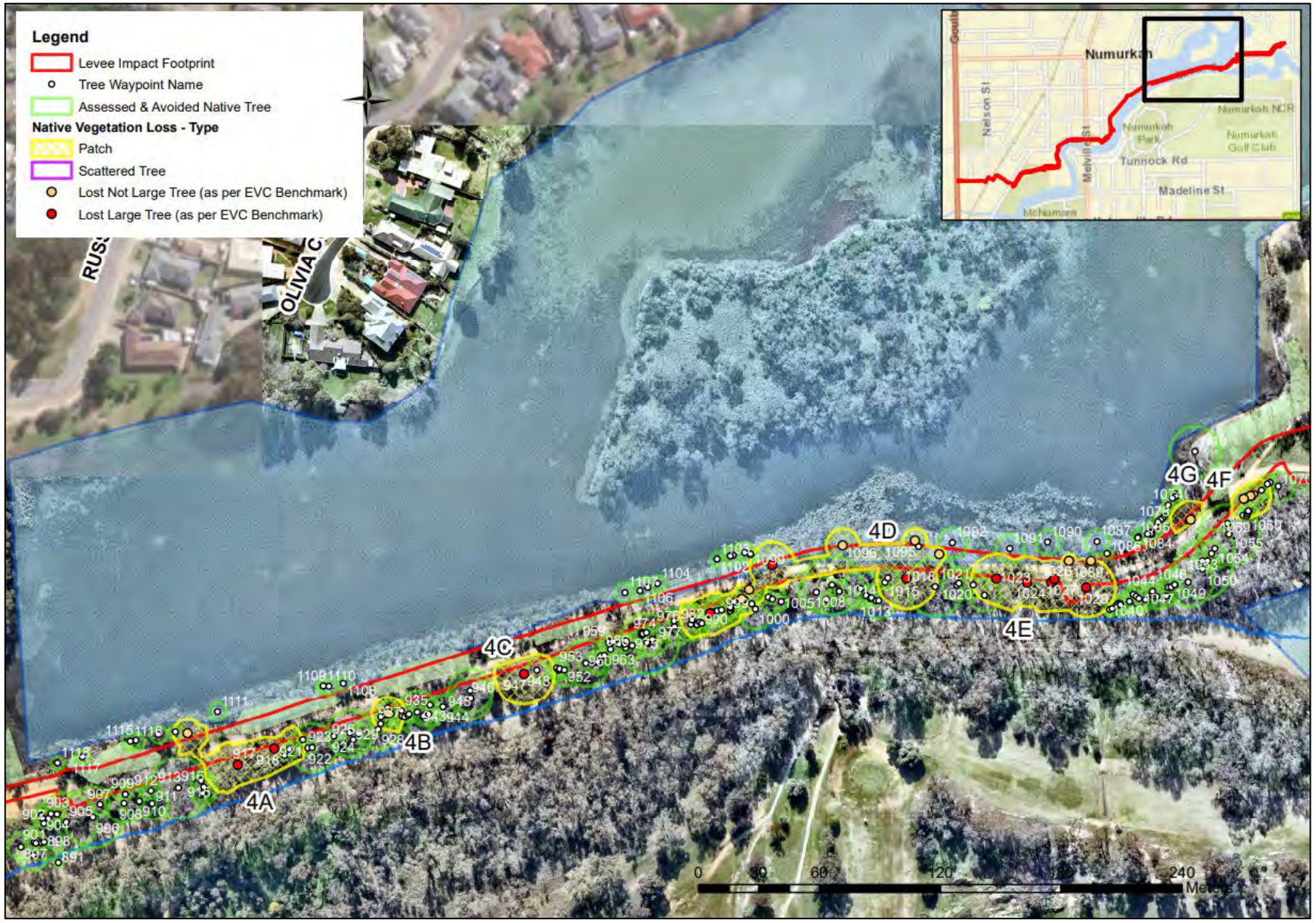
Proposed vegetation removal details	
Assessment pathway	Detailed
Extent of removal	1.857 hectares
No. large trees to be removed	22
General offset amount	0.597 general habitat units
Total number of large trees that offset must protect	22
Minimum strategic biodiversity score	0.486

Map 15A: Proposed Losses in Levee Section 1 - Goulburn Valley Highway/Needham Street to Station Street. Losses labelled according to the NVR report in Appendix 6.

Map 15B: Proposed losses in Levee Section 2 - Station Street to Melville Street. Losses labelled according to the NVR report in Appendix 6.



Map 15C: Proposed losses in Levee Section 3 - Melville Street to Numurkah Lake Carpark. Losses labelled according to the NVR report in Appendix 6.



Map 15D: Proposed losses in Levee Section 4 - Lake Numurkah Path West. Losses labelled according to the NVR report in Appendix 6.

Map 15E: Proposed losses in Levee Section 5 – Lake Numurkah Path East and Kinnairds Road. Losses labelled according to the NVR report in Appendix 6.

5.2.1 Habitat Hectares

As per the Guidelines, areas of native vegetation that meet the definition are called a 'patch'. Within a patch, areas of uniform quality for each EVC within the patches are termed 'habitat zones' (HZ). Where there are habitat zones of the same EVC in the same patch, and undergoing the same management regime, these are all given the same habitat zone score UNLESS any of the same EVC habitat zones score 15 points different in the habitat hectare assessment method. Where a habitat zone is separated from other zones by roads, buildings etc, these are also called habitat zones, and are only assessed separately if they are on a different tenure, experience much different management regimes or if they score 15 points higher or lower than other examples of the EVC on the same land tenure.

Six habitat zones are identified across the study area. The results of the condition assessment are provided in **Table 16A,** with the number of habitat hectares in each HZ; all of which are to be removed as part of the project. Photos of the proposed HZ losses are in **Appendix 5**.

Table 16A: Habitat hectares of the native vegetation within the study area

Trail Section Name/Number			1	2	3	4	5	5	
Site ID			1	2	3	4	5	5	
Habitat Zone ID			A	A and B	A to G	A to G	A	B	
EVC #: Name			PW 803	PGW 55_61	PGW 55_61	PGW 55_61	PGW 55_61	PGW 55_61	
VQA Component		Max Score	Score	Score	Score	Score	Score	Score	Total
Site Condition	Large Trees	10	3	3	2	7	0	7	
	Canopy Cover	5	5	4	3	4	0	4	
	Lack of Weeds	15	9	2	0	2	6	2	
	Understorey	25	0	0	10	10	10	10	
	Recruitment	10	0	0	5	1	0	1	
	Organic Matter	5	5	3	5	5	5	5	
	Logs	5	0	0	0	3	0	3	
	Total Site Score		22	12	25	32	21	32	
Landscape Value	Patch Size	10	1	1	1	1	1	1	
	Neighbourhood	10	0	0	0	0	0	0	
	Distance to Core	5	0	0	0	0	0	0	
	Total Landscape Score		1	1	1	1	1	1	
Habitat Score		100	23	13	26	33	22	33	
Habitat points = #/100		1	0.23	0.13	0.26	0.33	0.22	0.33	1.500
Condition Score Applied (i.e. partial)			0.23	0.13	0.26	0.33	0.22	0.33	1.500
Habitat Zone area (ha)			0.010	0.193	0.308	0.674	0.372	0.031	1.588
Habitat Hectare units			0.002	0.025	0.080	0.222	0.082	0.010	0.421

5.2.2 Lost Native Trees

Of the 436 native trees assessed, there are 58 native trees (54 trees in patches and 4 scattered trees) considered lost directly by removal or as consequential loss due to TPZ/SRZ impacts within the development footprint as identified in **Table 16B** and **Map 15A to 15E.** This includes 19 large patch trees and 3 large scattered trees (as per the relevant EVC benchmark). Photos of the proposed losses are in **Appendix 5**. Further details for each tree (e.g., size, extent, species, DBH) are also provided in the Arborist Report in **Appendix 9**. Scattered trees losses within the study area equate to 0.0485 habitat hectares (see **Table 17**).

Table 16B: Native Trees in Patches and Scattered Trees removal details (*=Large Tree as per EVC Benchmark, specific HZ = Habitat Zone Patch as per Table 16, ST= Scattered Tree).

Waypoint	Species	DBH (cm)	Tree Size*	Offset Category
727	River Red-gum	70	Large	ST
728	Grey Box	115	Large	ST
730	River Red-gum	90	Large	HZ-1A
731	River Red-gum	80	Large	HZ-1A
754	River Red-gum	20	Small	HZ-2B
758	River Red-gum	65	Small	HZ-2B
769	River Red-gum	155	Large	HZ-2A
770	River Red-gum	55	Small	HZ-2A
772	River Red-gum	105	Large	HZ-2A
773	River Red-gum	145	Large	HZ-2A
775	River Red-gum	25	Small	ST
776	River Red-gum	105	Large	ST
786	River Red-gum	90	Large	HZ-3B
801	River Red-gum	50	Small	HZ-3A
802	River Red-gum	120	Large	HZ-3A
803	River Red-gum	55	Small	HZ-3A
804	River Red-gum	30	Small	HZ-3A
805	River Red-gum	45	Small	HZ-3A
807	River Red-gum	65	Small	HZ-3A
833	River Red-gum	75	Small	HZ-3C
848	River Red-gum	55	Small	HZ-3D
853	River Red-gum	30	Small	HZ-3E
854	River Red-gum	65	Small	HZ-3E
869	River Red-gum	55	Small	HZ-3F
890	River Red-gum	110	Large	HZ-3G
917	River Red-gum	135	Large	HZ-4A
918	River Red-gum	175	Large	HZ-4A
932	River Red-gum	70	Small	HZ-4B
947	River Red-gum	150	Large	HZ-4C
985	River Red-gum	130	Large	HZ-4D
996	River Red-gum	65	Small	HZ-4D
1001	River Red-gum	70	Small	HZ-4D
1017	River Red-gum	140	Large	HZ-4D
1023	River Red-gum	105	Large	HZ-4E
1024	River Red-gum	110	Large	HZ-4E
1025	River Red-gum	95	Large	HZ-4E
1026	River Red-gum	35	Small	HZ-4E
1027	River Red-gum	80	Large	HZ-4E
1028	River Red-gum	120	Large	HZ-4E
1057	River Red-gum	20	Small	HZ-4G
1063	River Red-gum	20	Small	HZ-4F
1064	River Red-gum	25	Small	HZ-4F
1065	River Red-gum	55	Small	HZ-4F

Waypoint	Species	DBH (cm)	Tree Size*	Offset Category
1088	River Red-gum	20	Small	HZ-4E
1089	River Red-gum	30	Small	HZ-4E
1093	River Red-gum	25	Small	HZ-4D
1094	River Red-gum	50	Small	HZ-4D
1096	River Red-gum	70	Small	HZ-4D
1097	River Red-gum	95	Large	HZ-4D
1112	River Red-gum	60	Small	HZ-4A
1126	River Red-gum	20	Small	HZ-5A
1127	River Red-gum	30	Small	HZ-5A
1128	River Red-gum	25	Small	HZ-5A
1140	Grey Box	75	Small	HZ-5B
1141	Grey Box	15	Small	HZ-5B
1142	Grey Box	15	Small	HZ-5B
1143	Grey Box	25	Small	HZ-5B
1144	Grey Box	25	Small	HZ-5B

Table 17: Habitat hectare conversion for lost scattered trees within the study area.

Size Category	Number within study area	Condition score	Standard extent (ha)	Habitat hectares (Hha)
Small	1	0.20	0.0313	0.0063
Large	3	0.20	0.0703	0.0422
TOTAL	4	n/a	n/a	0.0485

5.3 Assessment Pathway of Application

In Victoria, applications to impact or remove native vegetation are categorised into three assessment pathway categories: **basic, intermediate** or **detailed**. The application requirements and decision guidelines in Clause 52.17 must be applied in accordance with the relevant assessment pathway. To determine the assessment pathway, two factors are considered in relation to the native vegetation proposed to be removed:

- the location categories (shown in the location maps a location 1, 2 or 3)
- the extent of proposed native vegetation removal

EXTENT OF NATIVE VEGETATION	LOCATION 1	LOCATION 2	LOCATION 3
Less than 0.5 hectares and not including any Large Trees	Basic	Intermediate	Detailed
Less than 0.5 hectares and including one or more Large Trees	Intermediate	Intermediate	Detailed
0.5 hectares or more	Detailed	Detailed	Detailed

Source: Table 3 - Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017)

The proposal will require the removal of ≥ 0.5 hectares of native vegetation, therefore the application for removal of this native vegetation must meet the requirements of, and be assessed in, the Detailed Assessment Pathway. The NVR Report in **Appendix 6** outlines the patch, scattered tree and large tree components of the native vegetation being lost.

The vegetation to be removed mainly occurs within Location 2 risk category (with approximately one-third of the vegetation in Location 1) as shown in **Map 16**. If more than one location risks apply to vegetation proposed for removal the higher number is to be applied to the application, and therefore Location 2 is applied to this application. A detailed assessment pathway is required for this project as >0.5 hectares is to be removed.

Map 16. The Location Risk category for vegetation to be removed as taken from NVR Map.

5.4 Offset Requirements

To ensure a gain to Victoria's biodiversity that is equivalent to the loss resulting from the proposed removal of native vegetation, compensatory offsets are required. Losses and gains are measured in general or species habitat scores or units. The offset must also include at least one large tree for every large tree removed.

For a detailed assessment pathway application, the species-general offset test will determine if a general offset, species offset or combination of both is required. The results of the species-general offset test are provided in **Appendix 6** and summarized below in **Table 19**.

Table 19: Summary of the DEECA Native Vegetation Removal Report

Site Attribute	Outcome
Location category	2
Extent of native vegetation loss	1.857 hectares
Assessment pathway	Detailed
Location category of proposed removal	Location 2
Modelled habitat for any threatened species	Modelled habitat for 97 species, however all are below the species-general offset threshold of 0.005%.
Type of offset required	General
Offset amount (general habitat units)	0.597
Offset vicinity	Goulburn Broken Catchment Management Authority or Moira Shire Council
Minimum Strategic Biodiversity Value score for offset	0.486
Large tree requirements for offset	22

5.5 Proposed Offset Strategy

The proponent intends to purchase the offset credits from the Victorian Native Vegetation Credit Register (NVCR) through a registered offset broker. A search of the NVCR was completed and suitable offsets are available. A quotation from Vegetation Link has been sourced and there are suitable general habitat unit offset options available for purchase (see **Appendix 7**).

6 Key Ecological Values and Recommendations

This section identifies the key ecological features of the study area and provides a summary of the potential implications of the proposed development on these values, including recommendations to assist the proponent to design and implement the project to minimise impacts on biodiversity.

The primary measure to reduce impacts to biodiversity values within the study area is to avoid and minimise removal of native vegetation and terrestrial habitat. Impacts to native vegetation have been avoided and minimised to the greatest extent possible while still retaining features of the project that make it viable to undertake. Close liaison with the proponent occurred throughout the design stage of the project. The results of this assessment should therefore be incorporated into the project design, by adding the flora and fauna mapping information into the planning maps, ensuring that all retained vegetation is appropriately protected from development impacts.

Final design plans and on-ground works should aim to retain as much of the mapped vegetation and habitat values as possible, even if these values have already been considered 'lost' for the purposes of calculating vegetation impacts and offset obligations required for the project. All areas of native vegetation and sensitive habitats which are mapped as to be 'retained' in this report are to be appropriately signed, fenced and treated as no-go zones during construction, and are not to be encroached upon as the development progresses.

A summary of the potential development implications of the study area and recommendations to minimise ecological impacts during the construction phase of the project is provided below in **Table 20**.

Table 20: Summary of key ecological values, potential implications and recommendations to minimise impacts arising from the project.

Site feature	Implications of the proposed development	Recommendations
Native vegetation	The permanent removal of up to 1.857 hectares of endangered native vegetation, including 22 large trees and 36 small or medium trees. The impacts to areas of endangered Plains Woodland and Plains Grassy Woodland. The application will be assessed on the detailed assessment pathway. NB: Impacts to native vegetation are all below the specific offset threshold for the threatened species habitat modelled within the study area.	Avoid and minimise removal of native vegetation and terrestrial habitat in accordance with the Guidelines (no net loss). Refer to **Section 5.1.** Identify and implement appropriate general offsets for native vegetation losses as outlined in **Section 5.4**. Despite the native vegetation loss figures being accounted for and offset, all efforts should be made to retain as much native vegetation as possible during construction. All retained vegetation is to be avoided, with native vegetation clearly signed as no-go areas. All construction works and vehicles must be kept within the 3-metre-wide construction loss zones using the lightest weight and smallest construction vehicles possible. Absolutely no laydown areas within native vegetation areas including tree TPZs.

Site feature	Implications of the proposed development	Recommendations
		Construction workers must be educated about the threatened species and threatened ecological communities which have been recorded in the study area. Any new threatened species records must be captured with GPS. If any sightings are made in the works zone, works must stop in that area until DEECA have been engaged with about the options available to avoid impacts to the threatened species. All trees for removal must be identified and clearly marked to ensure that there is no confusion between trees being removed/retained. Avoid excavation within TPZ, and instead use small volumes of clean fill to create a level surface for the levee without disturbance being made to tree or shrub roots. No fallen timber is to be removed from the study area, but instead can be moved to a location out of the work zone. As a precaution, where any clearing is required that involves removing large shrubs or stumps, or moving fallen timber, an ecologist or wildlife handler should be present to ensure there are no listed fauna present in the works area prior to work starting. Felled trees must be inspected for displaced or injured fauna. If located before or during works, work must stop until the specimen can be relocated away from the work site or taken to a wildlife shelter in the instance of any injured animals. All construction takes place when the soil is dry, to ensure any minor movement of vehicles or plant past the 3-metre loss area occurs upon dry soil to minimise the impacts to soil and vegetation from the passage of these vehicles.
Threatened ecological Communities	Possible presence of the FFG Act listed 'Lowland Riverine Fish Community of the Southern Murray-Darling Basin' TEC.	A pre-referral meeting with the Commonwealth Department of Agriculture, Water and Environment (DAWE) is recommended to take place prior to proceeding with a formal referral application under the EPBC Act. A CEMP should be developed that mitigates risk to this listed wetland before, during and after the construction phases of the project.
Threatened species	Impacts to threatened species or their habitats within the study area	The SIC assessments in Appendix 3 determined that one (1) of the four (4) listed fauna species are considered possible to meet the criteria for being 'significantly impacted' under this Act for Brown Treecreeper (eastern subspecies). Therefore, a pre-referral meeting with the Commonwealth Department of Agriculture, Water and Environment (DAWE) is recommended to take place prior to proceeding with a formal referral application under the EPBC Act. No EPBC listed flora species were recorded and are highly unlikely to occur, owing to the poor quality of the remaining native vegetation, historic site modification and ongoing disturbance of the site.

Site feature	Implications of the proposed development	Recommendations
Retained trees and other habitat		Install barriers to help protect sensitive features and areas of high biodiversity value from being encroached upon by the levee and trail users. Install interpretative signage to inform trail users about the natural assets being protected and to educate people about the need to keep to the trail and to stay out of sensitive areas.
Habitat values	Removal of trees, some of which are large with hollows	Offer the CMA or Fisheries some or all the trees to be used in their restoration of fish habitat projects. If not required, trees should be in a nearby reserve where they can form ground habitat for native fauna.
Erosion and Sediment control	Protection of significant wetlands and waterways for biodiversity conservation.	Show site drainage patterns and identify any areas at risk of being affected by erosion or sedimentation. Detail on how erosion and sedimentation risks will be managed must be provided with consideration of the following: • retain existing vegetation; • drainage management including how stormwater will be managed to ensure sediment laden water does not flow into conservation areas. Discharged water must have turbidity as less than or equal to the receiving waters or otherwise ≤30NTU, whichever measure lower; monitor water quality where works are in proximity of waterways and or will result in discharge of water to the conservation area; • soil stabilisation; • stockpile protection and stabilisation; • silt fencing; • suitable in-stream/high-flow sediment and erosion controls; • contingencies for high rainfall events and/or if control measures prove not to be effective. Contingencies should be specific to ensuring the protection of biodiversity values.
Pest plants and animals	Introduction of pest species into or from the study area.	• Efforts should be made to control the noxious and environmental weeds and pests prior to the construction phase starting. • Develop hygiene controls for vehicle and machinery movement to minimise the spread of pathogens and weeds, particularly diseases such as Cinnamon Fungus (*Phytophthora*).
Construction	Dust, noise and hours of work	Add in here about recommendation to consult with locals re these issues, give them some opportunity to provide feedback and suggestions to council. Also allows council to explain how they plan to tackle the issues of noise, vibration, dust, traffic issues etc.
Biodiversity protection		Council is a 'public authority' and therefore the FFG Act public authority duty applies to this development. This assessment and report are considering the impacts to biodiversity on the authority's (Council's) behalf; however, the findings and recommendations of this report should be reviewed by Council to ensure they are satisfied with the assessment of biodiversity impacts and the recommendations being put in place to minimise impacts to biodiversity that result from the levee and trail development.

6.1 Construction and Post-Construction Management

Specific detail relating to preventing impacts to retained native vegetation and habitat should be addressed in a site-specific CEMP. This will include issues relating to contractors such as environmental inductions, protection of avoided native vegetation and habitat, installation of temporary fencing/signage, drainage, erosion and sediment control to protect the Broken Creek and Lake Numurkah.

7 References

Agriculture Victoria 2023. Information on CaLP Act-listed weeds can be accessed at: http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/weeds

DAWE 2006. Commonwealth Listing Advice on *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Threatened Species Scientific Committee, Department of Agriculture, Water and the Environment. Available at: http://www.environment.gov.au/biodiversity/threatened/communities/box-gum.html

DAWE 2010. Commonwealth Listing Advice on *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*. Department of the Environment, Water, Heritage and the Arts, Canberra, ACT. Available at: https://www.environment.gov.au/biodiversity/threatened/communities/pubs/86-listing-advice.pdf

DCCEEW 2023a. Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Commonwealth Department of Climate Change, Energy, the Environment and Water, Canberra, Australia. Available at: https://www.dcceew.gov.au/environment/epbc

DCCEEW 2023. EPBC Act Protected Matters Search Tool. Commonwealth Department of Climate Change, Energy, the Environment and Water, Canberra, Australia. Available at: http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.js

DCCEEW 2023c. Listed species and ecological community permits. Commonwealth Department of Climate Change, Energy, the Environment and Water, Canberra, Australia. Available at: https://www.environment.gov.au/biodiversity/threatened/permits

DCCEEW 2023d. Weeds of national significance list. Commonwealth Department of Climate Change, Energy, the Environment and Water, Canberra, Australia. Available at: http://environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html#top

DCCEEW 2023e. Species Profile and Threats Database. Commonwealth Department of Climate Change, Energy, the Environment and Water, Canberra, Australia. Available at: http://www.environment.gov.au/sprat

DCCEEW 2023f. Threatened ecological communities in Victoria. Commonwealth Department of Climate Change, Energy, the Environment and Water, Canberra, Australia. Available at: https://www.environment.gov.au/biodiversity/threatened/communities/vic

DCCEEW 2023g. Referrals and environmental assessments under the EPBC Act, Commonwealth Department of Climate Change, Energy, the Environment and Water, Canberra, Australia. Available at: https://www.dcceew.gov.au/environment/epbc/approvals

DEECA 2023a. NatureKit interactive map. Victorian Department of Energy, Environment and Climate Action, East Melbourne, Victoria. Available at: http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit

DEECA 2023b. Flora and Fauna Guarantee Act 1988 Threatened List – June 2023. Victorian Department of Energy, Environment and Climate Action, East Melbourne, Victoria. Available at: https://www.environment.vic.gov.au/conserving-threatened-species/threatened-list

DEECA 2023c. Flora and Fauna Guarantee Act 1988 Threatening Processes List – May 2023. Victorian Department of Energy, Environment and Climate Action, East Melbourne, Victoria. Available at: https://www.environment.vic.gov.au/conserving-threatened-species/threatened-list

DEECA 2023d. Bioregions and EVC Benchmarks. Victorian Department of Energy, Environment and Climate Action, East Melbourne, Victoria. Available at https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks

DELWP 2015. Levee Management Guidelines. Victorian Department of Environment, Land, Water and Planning, East Melbourne, Victoria.

DELWP 2017. Guidelines for the removal, destruction or lopping of native vegetation. Victorian Department of Environment, Land, Water and Planning, East Melbourne, Victoria.

DELWP 2017b. Exemptions from requiring a planning permit to remove, destroy or lop native vegetation – Guidance. Victorian Department of Environment, Land, Water and Planning, East Melbourne, Victoria.

DELWP 2018. Assessor's Handbook, Applications to remove, destroy or lop native vegetation (Version 1.1), Victorian Government, Department of Environment, Land, Water and Planning, Melbourne.

DELWP 2021. Flora and Fauna Guarantee Act 1988 Threatened List - Characteristics of Threatened Communities. Victorian Department of Environment, Land, Water and Planning, East Melbourne, Victoria.

DELWP 2023. Native Vegetation Information Management system. Maintained by the Department of Environment, Land, Water and Planning, East Melbourne, Victoria. Available at: https://nvim.delwp.vic.gov.au/

DEPI 2013. Permitted clearing of native vegetation - Biodiversity assessment guidelines. Victorian Government Department of Environment and Primary Industries, Melbourne.

DNRE 2002. Victoria's Native Vegetation Management: A Framework for Action. Victorian Government Department of Natural Resources and Environment, East Melbourne.

DoEE 2019. Environment assessment and approval process, Commonwealth Department of the Environment and Energy, Canberra. Available at: http://www.environment.gov.au/protection/environment-assessments/assessment-and-approval-process

DoE 2013. Matters of National Environmental Significance – Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999. Commonwealth Department of the Environment, Canberra.

DSE 2004. Native Vegetation: Sustaining a living landscape. Vegetation Quality Assessment Manual – Guidelines for applying the Habitat hectares scoring method. Version 1.3. Victorian Government Department of Sustainability and Environment, Melbourne.

DSE 2006. Ministerial guidelines for assessment of environmental effects under the Environmental Effects Act 1978. Department of Sustainability and Environment, East Melbourne, Victoria. Available at: https://www.planning.vic.gov.au/__data/assets/pdf_file/0031/619771/ministerial-guidelines-assessment-of-environmental-effects.pdf

DSE 2011. Victoria's Native Vegetation Management: A Framework for Action. Department of Sustainability and Environment, Melbourne.

DTP 2023. Planning Schemes Online. Victorian Department of Transport and Planning, East Melbourne, Victoria. Available at: https://www.planning.vic.gov.au/planning-schemes/browse-planning-schemes

DTP 2023b. Vicplan Mapping Tool. Victorian Department of Transport and Planning, East Melbourne, Victoria.

Available at: https://mapshare.vic.gov.au/vicplan/

DWHA 2010. Commonwealth Listing Advice on Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. Threatened Species Scientific Committee, Department of the Environment, Water, Heritage and the Arts, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/86-listing-advice.pdf.

SWIFFT 2022. Threatened Species Profiles. State Wide Integrated Flora and Fauna Teams. Available at: https://www.swifft.net.au/cb_pages/threatened_species_profiles.php

VicFlora 2023. Flora of Victoria, Royal Botanic Gardens Victoria. Available at: https://vicflora.rbg.vic.gov.au

Visualising Victoria's Biodiversity 2022. Visualising Victoria's Biodiversity (VVB). A Centre for eResearch and Digital Innovation (CERDI) initiative, partnered with Statewide Integrated Flora and Fauna Teams (SWIFFT). Available at: http://www.vvb.org.au/vvb_map.php?view=3017_aef3114

8 Appendices

Appendix 1A: Flora Species Recorded in Study Area

Notes to Tables:

EPBC Act: CR - Critically Endangered EN - Endangered VU - Vulnerable **FFG Act:** ex - extinct ex – in the wild cr – critically endangered en - endangered vu - vulnerable cd – conservation dependent	**FFG Act Permits:** P = Protected Flora PC = Protected Flora of a Listed Community **CALP Act - Noxious weed status:** SP - State prohibited species RP - Regionally prohibited species RC - Regionally controlled species RR - Regionally restricted species # - Non-indigenous native species *- Exotic species WONS - Weed of National Significance

Table A1.1 Flora species recorded from the study area (2023).

Scientific Name	Common Name	Status	FFG Act-listed Protected Flora
Acacia acinacea	Gold-dust Wattle		P
Acacia dealbata	Silver Wattle		
Acacia implexa	Lightwood		
Acacia pycnantha	Golden Wattle		P
Acacia salicina	Willow Wattle		P
Acacia verniciflua	Varnish Wattle		P
Acetosella vulgaris	Sheep Sorrel	*	
Agrostis capillaris	Brown-top Bent	*	
Allocasurina verticillata	Drooping Sheoak		
Alternanthera denticulata	Lesser Joyweed		
Amyema pendula	Drooping Mistletoe		
Arctotheca calendula	Cape Weed	*	
Asparagus asparagoides	Bridal Creeper	* RR WONS	
Atriplex semibaccata	Berry Saltbush		
Austrostipa scabra subsp. scabra	Rough Spear-grass		
Austrostipa spp.	Spear Grass		
Avena barbata	Bearded Oat	*	
Avena fatua	Wild Oat	*	
Avena spp.	Oat	*	
Bothriochloa macra	Red-leg Grass		
Brachychiton populneus subsp. populneus	Kurrajong		
Briza sp.	Quaking-grass	*	
Bromus catharticus	Prairie Grass	*	
Bromus spp.	Brome	*	
Bursaria spinosa subsp. spinosa	Sweet Bursaria		
Callistemon sieberi	River Bottlebrush	#	
Callistemon sp.	Planted Bottlebrush	#	
Callitris glaucophylla	White Cypress-pine		
Carex bichenoviana	Plains Sedge		

Scientific Name	Common Name	Status	FFG Act-listed Protected Flora
Carex spp.	Sedge		
Carex tereticaulis	Poong'ort		
Cenchrus clandestinus	Kikuyu	*	
Cerastium glomeratum	Common Mouse-ear Chickweed	*	
Ceratonia siliqua	Carob Tree	*	
Chenopodium album	Fat Hen	*	
Chenopodium desertorum subsp. microphyllum	Small-leaf Goosefoot		
Chloris truncata	Windmill Grass		
Cirsium vulgare	Spear Thistle	* RR	
Corymbia citriodora	Lemon-scented Gum	#	
Corymbia maculata	Spotted Gum	#	
Crataegus monogyna	Hawthorn	*	
Cynodon dactylon var. dactylon	Couch	*	
Cyperus eragrostis	Drain Flat-sedge	*	
Dactylis glomerata	Cocksfoot	*	
Dichanthium sericeum	Silky Blue-grass		
Diplotaxis spp.	Wild Rocket	*	
Dodonaea viscosa subsp. cuneata	Wedge-leaf Hop-bush		
Echium plantagineum	Paterson's Curse	* RC	
Ehrharta longiflora	Annual Veldt-grass	*	
Ehrharta spp.	Veldt-grass	*	
Einadia hastata	Saloop		
Einadia nutans	Nodding Saltbush		
Enchylaena tomentosa var. tomentosa	Ruby Saltbush		
Enteropogon acicularis	Spider Grass		
Eragrostis brownii	Common Love-grass		
Eragrostis spp.	Love Grass		
Erigeron bonariensis	Flaxleaf Fleabane	*	
Erigeron spp.	Fleabane	*	
Erodium cicutarium	Common Heron's-bill	*	
Erodium sp.	Heron's-bill	*	
Eucalyptus behriana	Bull Mallee	#	
Eucalyptus camaldulensis	River Red-gum		
Eucalyptus cladocalyx	Sugar Gum	#	
Eucalyptus microcarpa	Grey Box		
Eucalyptus radiata	Narrow-leaved Peppermint	#	
Eucalyptus sideroxylon	Red Ironbark	#	
Eucalyptus spp.	Planted Gum species	#	
Euchiton involucratus	Star Cudweed		
Fraxinus angustifolia subsp. angustifolia	Desert Ash	*	
Fumaria spp.	Fumitory	*	
Galium aparine	Cleavers	*	
Gazania spp.	Gazania	*	
Geranium solanderi	Austral Crane's-bill		
Geranium spp.	Crane's-bill		
Grevillea robusta	Silky Oak	#	
Heliotropium europaeum	Common Heliotrope	*	
Helminthotheca echioides	Ox-tongue	*	
Hordeum spp.	Barley Grass	*	
Hypochaeris glabra	Smooth Cat's-ear	*	
Hypochaeris radicata	Flatweed	*	
Juncus spp.	Rush		

Scientific Name	Common Name	Status	FFG Act-listed Protected Flora
Juncus subsecundus	Finger Rush		
Lactuca serriola	Prickly Lettuce	*	
Laphangium luteoalbum	Jersey Cudweed		
Lepidium africanum	Common Peppercress	*	
Ligustrum lucidum	Large-leaved Privet	*	
Lobelia pratioides	Poison Lobelia		
Lolium perenne	Perennial Rye-grass	*	
Lolium rigidum	Wimmera Rye-grass	*	
Lolium spp.	Rye Grass	*	
Lycium ferocissimum	African Box-thorn	* RC WONS	
Lysimachia arvensis	Pimpernel	*	
Lythrum hyssopifolia	Small Loosestrife		
Malva parviflora	Small-flowered Mallow	*	
Marrubium vulgare	Horehound	* RC WONS	
Medicago spp.	Medic	*	
Melaleuca sp.	Paperbark	#	
Melia azedarach	White Cedar	*	
Microlaena stipoides var. stipoides	Weeping Grass		
Modiola caroliniana	Red-flower Mallow	*	
Olea europaea subsp. europaea	Common Olive	*	
Oxalis perennans	Grassland Wood-sorrel		
Oxalis pes-caprae	Soursob	* RR	
Oxalis sp.	Wood-sorrel		
Panicum effusum	Hairy Panic		
Panicum spp.	Panic		
Paspalidium jubiflorum	Warrego Summer-grass		
Paspalum dilatatum	Paspalum	*	
Paspalum distichum	Water Couch	*	
Paspalum spp.	Paspalum	*	
Persicaria decipiens	Slender Knotweed		
Phalaris aquatica	Toowoomba Canary-grass	*	
Phalaris minor	Lesser Canary-grass	*	
Plantago lanceolata	Ribwort	*	
Poa annua	Annual Meadow-grass	*	
Poa labillardierei	Common Tussock-grass		
Polygonum aviculare	Prostrate Knotweed	*	
Quercus palustris	Pin Oak	*	
Romulea rosea	Onion Grass	*	
Rosa rubiginosa	Sweet Briar	* RC	
Rosa spp.	Planted Rose	*	
Rubus fruticosus spp. agg.	Blackberry	*RC WONS	
Rumex crispus	Curled Dock	*	
Rytidosperma caespitosum	Common Wallaby-grass		
Rytidosperma duttonianum	Brown-back Wallaby-grass		
Rytidosperma setaceum	Bristly Wallaby-grass		
Rytidosperma spp.	Wallaby Grass		
Salix spp.	Willow	*	
Salvia verbenaca	Wild Sage	*	
Schinus molle	Pepper Tree	*	
Schoenus apogon	Common Bog-sedge		
Sclerolaena muricata var. semiglabra	Dark Roly-poly		
Senecio quadridentatus	Cottony Fireweed		
Setaria parviflora	Slender Pigeon Grass	*	
Setaria spp.	Pigeon-grass	*	

Scientific Name	Common Name	Status	FFG Act-listed Protected Flora
Solanum nigrum	Black Nightshade	*	
Solanum spp.	Nightshade	*	
Sonchus oleraceus	Common Sow-thistle	*	
Sonchus spp.	Sow-thistle	*	
Stellaria media	Chickweed	*	
Trifolium angustifolium var. angustifolium	Narrow-leaf Clover	*	
Trifolium arvense var. arvense	Hare's-foot Clover	*	
Trifolium repens var. repens	White Clover	*	
Trifolium spp.	Clover	*	
Trifolium subterraneum	Subterranean Clover	*	
Typha spp.	Cumbungi		
Ulmus parvifolia	Chinese Elm	*	
Vicia sativa	Common Vetch	*	
Vittadinia spp.	New Holland Daisy		
Vulpia bromoides	Squirrel-tail Fescue	*	
Vulpia spp.	Fescue	*	
Wahlenbergia spp.	Bluebell		
Walwhalleya proluta	Rigid Panic		
Xanthium spinosum	Bathurst Burr	* RC	
		Total Count = 155 (58 Native and 97 Exotic)	

Appendix 1B: Listed Flora Species

The following table includes the listed flora species that have potential to occur within the study area. The list of species is sourced from the Victorian Nature Kit and the Protected Matters Search Tool (accessed October 2023).

Table A1.2 Listed flora species recorded/predicted to occur within 5 kilometres of the study area with likelihood of occurrence: Negligible, Low, Medium, High or Recorded.

Species Name	Common Name	EPBC Act	FFG Act	Habitat description	Last Year Observed	Number of Records	Likelihood	Justification
Allocasuarina luehmannii	Buloke		cr	On the drier inland plains, commonly associated with Grey Box and Native Pine open Woodlands (or former Grey Box Woodlands).	1994	8	Low	Possible, but unlikely that close to the creek and disturbance history of the site. Nearest record ~1.8km northwest of the project footprint from 1993. Not detected.
Amphibromus fluitans	River Swamp Wallaby-grass	VU		Moist soils, usually confined to permanent swamps, wetlands and billabongs and tolerates inundation. Occurs principally along the Murray River between Wodonga and Echuca, Ovens River.		May Occur	Low	Unlikely due to lack of suitable habitat, poor understorey condition, disturbance history, mowing regime and and absence of records in the broader local area, nearest record ~8km south of the project from 2008. Not detected.
Austrostipa wakoolica	Wakool Spear Grass	EN		Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise.		May Occur	Low	Unlikely due to lack of suitable habitat, poor understorey condition, disturbance history, mowing regime and and absence of records in the broader local area, nearest record ~75km north of the project from 2000. Not detected.
Brachyscome chrysoglossa	Yellow-tongue Daisy		en	Prefers heavy clay soils that are subject to inundation. Found in grasslands and woodlands.	1996	3	Low	Unlikely due to lack of suitable habitat, poor native understorey condition, disturbance history, mowing regime. Nearest record ~150m south from 1996 within the Numurkah Golf Course. Not detected.

Species Name	Common Name	EPBC Act	FFG Act	Habitat description	Last Year Observed	Number of Records	Likelihood	Justification
Brachyscome muelleroides	Mueller Daisy	VU	en	Seasonally wet depressions in the landscape such as wetlands, swampy dry forest, grasslands, lagoon and claypan margins in mud/shallow water, and floodplains.	1973	May Occur	Low	Unlikely due to lack of suitable habitat, poor native understorey condition, disturbance history, mowing regime. Nearest record ~10km northeast from 1996. Not detected.
Calotis anthemoides	Cut-leaf Burr-daisy		cr	Grows in open grassland, woodlands mostly in depressions or damp areas, on heavy soils.	1996	3	Low	Unlikely, due to poor condition of woodland understorey habitat and lack of records in the broader area. One record is located 150m to the south within the Golf Course from 1996. Not detected.
Cardamine moirensis	Riverina Bitter-cress		en	Low-lying areas adjacent to streams and swamps; mostly in the Riverina region.	2008	6	Low	Unlikely, due to poor condition of understorey habitat and lack of records in the broader area. One record is located 0.2km north from 1995. Not detected.
Eryngium paludosum	Long Eryngium		en	Swampy or flooded areas on sand, loam, clay and cracking clays.	2002	9	Low	Unlikely due to lack of suitable habitat, poor native understorey condition, disturbance history, mowing regime and and absence of records in the local urban area, nearest record 1.4 km northwest from 1991. Not detected.
Lepidium aschersonii	Spiny Peppercress	VU	vu	Periodically wet sites such as gilgai/wetland depressions and the margins of freshwater and saline marshes and shallow lakes, usually on heavy clay soils.		May Occur	Low	Unlikely due to lack of suitable habitat, poor native understorey condition, disturbance history, mowing regime and and absence of recent records in the broader area, nearest record 1.5km south from 1964.
Lepidium monoplocoides	Winged Pepper-cress	EN	en	An uncommon plant which prefers grasslands, wetlands, floodplain woodlands and chenopod scrublands., also persisting on bare areas on dry clay scolds.		May Occur	Negligible	Absence of suitable habitat in the project footprint and records in the broader area with nearest record ~30km north of study area along the Murray River floodplain from 2001 and 2020. Not detected.
Minuria integerrima	Smooth Minuria		vu	Occurs as scattered plants or small colonies, often in shallow water or mud	1996	2	Low	Possible, but unlikely due to poor condition, mowing and other disturbance history of the site. Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas. Nearest record ~150m south from 1996 within the Golf Course. Not detected.

Species Name	Common Name	EPBC Act	FFG Act	Habitat description	Last Year Observed	Number of Records	Likelihood	Justification
Myoporum montanum	Waterbush		en	Grows in open grassland and woodlands.	1932	1	Low	Possible, but unlikely due to poor condition and other disturbance history of the site. Nearest record ~1.2km west from 1932. Not detected.
Myriophyllum gracile var. lineare	Slender Water-milfoil	VU	vu	Occurs in shallow, ephemeral wetlands	2010	6	Negligible	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas. Nearest record ~150m south from 1996 within the Golf Course. Not detected.
Myriophyllum porcatum	Ridged Water-milfoil	VU		Occurs in shallow, ephemeral wetlands (including lakes, swamps, rock pools in granite outcrops, waterholes in claypans).	2008	1	Negligible	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas; very unlikely with nearest record 1.5 km northeast from 2008. Not detected.
Nymphonids crenata	Wavy Marshwort		en	Grows in mud of swamps, lagoons, irrigation channels, and also in temporarily inundated depressions/wetlands and in slow-flowing streams where the depth of the water is up to about 1.5 m deep.	1964	1	Low	Absence of recent local records and suitable habitat in the project footprint but may use adjoining lake and creek areas. Nearest record ~1.5km southeast from 1964. Not detected.
Panicum laevinode	Pepper Grass	EN				1	Low	Unlikely given poor understorey condition and mowing disturbance of impact site and lack of records in the local area with nearest being 2.5km south from 2001. Not detected.
Pimelea spinescens subsp. spinescens	Plains Rice-flower, Spiny Rice-flower, Prickly Pimelea	CR		Open grassland and woodlands		May Occur	Low	Possible, but unlikely given poor native understorey condition and mowing disturbance of impact site and no records in the local area. Not detected.
Sclerolaena napiformis	Turnip Copperburr	EN	cr	Found on fertile red clay loam plains in association with native grasslands or Box/Buloke woodland where it colonises small bare areas, sometimes in wet conditions.		May Occur	Low	Unlikely, due to poor understorey condition of habitat in the project footprint and absence of records in the broader region, nearest record ~35 km southwest of the project study area from 2009. Not detected despite.
Senecio longicollaris	Riverina Fireweed		en			1	Low	Possible, but unlikely given poor understorey condition and mowing disturbance of impact site and lack of records in the local area with nearest being 4km east from 2002. Not detected.

Species Name	Common Name	EPBC Act	FFG Act	Habitat description	Last Year Observed	Number of Records	Likelihood	Justification
Senecio macrocarpus	Large-fruit Fireweed, Large-fruit Groundsel	VU	cr	Grassy woodlands and grassland habitats, usually dominated by *Themeda trianda*. Stronghold seems to be in southwest Victoria.		May Occur	Low	Unlikely given poor woodland understorey condition and mowing disturbance and lack of records in the broader area with nearest being 140km southeast from 2011 closer to Bendigo. Not detected.
Senecio psilocarpus	Smooth-fruited Groundsel	VU		High-quality herb-rich wetlands on plains. During winter such sites can be inundated with up to 60 cm or more of water and are almost dry in summer. A tree canopy is absent from most sites, or rarely, River Red Gum.		May Occur	Negligible	Absence suitable habitat in the project footprint and adjoining lake and creek areas. Nearest record ~170km south from 1994. Not detected.
Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	VU	en	Found in native grassland, herbland, chenopod shrubland and open Black-box woodland, often in depressions in heavy grey or brown clay, loam, or red cracking clays.		May Occur	Negligible	Unlikely, absence of suitable habitat within the project footprint, poor condition and lack of records in broader region of study area with the nearest being ~7km northeast from 1997. Not detected.
Swainsona plagiotropis	Red Darling-pea, Red Swainson-pea	VU	en	Prefers heavy red soils in grassland habitats.		May Occur	Low	Unlikely, absence of suitable habitat within the project footprint and lack of records in broader region with the nearest being ~35km west of the project area near Tongala from 1986. Not detected.

Appendix 2A: Fauna Species Recorded in Study Area

Notes to Tables:

EPBC Act: EX - Extinct CR - Critically Endangered EN - Endangered VU – Vulnerable CD – Conservation Dependent **FFG Act:** ex - extinct	ex – in the wild cr – critically endangered en - endangered vu - vulnerable cd – conservation dependent **Introduced species:** PS - pest species listed under the CaLP Act * - introduced species

Table A2.1 Vertebrate fauna recorded from the study area.

Scientific Name	Common Name	Status
Acridotheres tristis	Common Myna	*
Anas superciliosa	Pacific Black Duck	
Anhinga novaehollandiae	Australasian Darter	
Anthochaera carunculata	Red Wattlebird	
Ardea pacifica	White-necked Heron	
Aythya australis	Hardhead	
Biziura lobata	Musk Duck	
Cacatua galerita	Sulphur-crested Cockatoo	
Cacatua sanguinea	Little Corella	
Chenonetta jubata	Australian Wood Duck	
Colluricincla harmonica	Grey Shrike-thrush	
Corvus coronoides	Australian Raven	
Corvus mellori	Little Raven	
Cygnus atratus	Black Swan	
Dacelo novaeguineae	Laughing Kookaburra	
Entomyzon cyanotis	Blue-faced Honeyeater	
Eolophus roseicapilla	Galah	
Fulica atra	Eurasian Coot	
Gallinula tenebrosa	Dusky Moorhen	
Grallina cyanoleuca	Magpie-lark	
Gymnorhina tibicen	Australian Magpie	
Hirundo neoxena	Welcome Swallow	
Crinia parinsignifera	Eastern Sign-bearing Froglet	
Crinia signifera	Common Froglet	
Litoria peronii	Peron's Tree Frog	
Malurus cyaneus	Superb Fairy-wren	
Manorina melanocephala	Noisy Miner	
Microcarbo melanoleucos	Little Pied Cormorant	
Ocyphaps lophotes	Crested Pigeon	
Oryctolagus cuniculus	European Rabbit	* PS
Pardalotus striatus	Striated Pardalote	
Passer domesticus	House Sparrow	*
Pelecanus conspicillatus	Australian Pelican	
Phalacrocorax sulcirostris	Little Black Cormorant	
Platycercus eximius	Eastern Rosella	
Poliocephalus poliocephalus	Hoary-headed Grebe	
Porphyrio melanotus	Australasian Swamphen	
Psephotus haematonotus	Red-rumped Parrot	
Ptilotula penicillata	White-plumed Honeyeater	
Rhipidura leucophrys	Willie Wagtail	
Spilopelia chinensis	Spotted Dove	

Scientific Name	Common Name	Status
Strepera graculina	Pied Currawong	
Sturnus vulgaris	Common Starling	
Tachybaptus novaehollandiae	Australasian Grebe	
Threskiornis molucca	Australian White Ibis	
Threskiornis spinicollis	Straw-necked Ibis	
Turdus merula	Common Blackbird	*
Vanellus miles	Masked Lapwing	
		Total Count = 49

Appendix 2B: Listed Fauna Species

The following table includes a list of the listed fauna species that have potential to occur within 5 kilometres of the study area. The list of species is sourced from the Victorian Nature Kit and the Protected Matters Search Tool (accessed 2023).

Table A2.2 Listed terrestrial fauna species recorded or predicted to occur within 5 kilometres of the study area with likelihood of occurrence (Negligible, Low, Medium, High or Recorded) and justification.

Scientific Name	Common Name	FFG Act Status	EPBC Act Status	Last Year Observed	Number of Records	Appropriate Habitat	Likelihood of presence	Justification
Botaurus poiciloptilus	Australasian Bittern	Critically Endangered	Endangered	2004	3	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Spatula rhynchotis	Australasian Shoveler	Vulnerable		2017	12	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Ixobrychus dubius	Australian Little Bittern	Endangered		2007	1	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Rostratula australis	Australian Painted Snipe		Endangered	May occur	0	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Falco subniger	Black Falcon	Critically Endangered		2000	1	Yes	Low	May occur, but not on a regular basis due to urban disturbance and threats; more likely to use surrounding farming land and non-urban woodland habitat areas. Closest record 2km to the northwest from 2000 in farming land.
Neophema chrysostoma	Blue-winged Parrot		Vulnerable	May occur	0	Yes	Low	May occur due to some limited suitable woodland grass habitat features, but unlikely on a regular basis due to site modification and high level of mowing disturbance and urban threats. Closest record 8km south from 2022.
Antigone rubicunda	Brolga	Endangered		1973	1	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas; very unlikely with most recent record from 1973.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)		Vulnerable	2018	0	Yes	**High**	A likely resident of the impact site having been recently recorded nine times in similar remnant woodland along the Broken Creek (within 500 metres) and the nearby Kinnairds Wetland.
Burhinus grallarius	Bush Stone-curlew	Critically Endangered		1973	1	No	Negligible	Very unlikely to occur due to lack of suitable habitat given poor site condition and urban disturbance and threats. Most recent record from 1973.
Actitis hypoleucos	Common Sandpiper		Migratory	May occur	0	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas. Nearest record ~20km southwest from 2023.

Scientific Name	Common Name	FFG Act Status	EPBC Act Status	Last Year Observed	Number of Records	Appropriate Habitat	Likelihood of presence	Justification
Calidris ferruginea	Curlew Sandpiper		Critically Endangered Migratory	May occur	0	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Stagonopleura guttata	Diamond Firetail	Vulnerable	Vulnerable	1994	1	Yes	Low	Possible, but unlikely to occur on a regular basis due to poor site understorey condition and urban disturbance and threats.
Numenius madagascariensis	Eastern Curlew		Critically Endangered Migratory	May occur	0	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Ardea alba modesta	Eastern Great Egret	Vulnerable		2019	7	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Apus pacificus	Fork-tailed Swift		Migratory	2005	1	Yes	Low	May occasionally occupy airspace above the study area. Nearest record ~2.6km from 2006 to the south of study area.
Stictonetta naevosa	Freckled Duck	Endangered		2001	1	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Falco hypoleucos	Grey Falcon	Vulnerable	Vulnerable	May occur	0	Yes	Low	Unlikely to occur on a regular basis due to urban disturbance and threats; more likely to use surrounding farming land and non-urban woodland habitat areas. Closest record 10km north from 1999 in farming land.
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	2020	2	Yes	**High**	Suitable habitat and roost 200m south of site along Broken Creek with a count 50 from 2000.
Litoria raniformis	Growling Grass Frog	Vulnerable	Vulnerable	1973	1	No	Low	Unlikely to occur due to lack of suitable wetland habitat with poor site understorey condition, urban disturbance and threats. Most recent record from 1973.
Aythya australis	Hardhead	Vulnerable		2018	13	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Varanus varius	Lace Monitor	Endangered		1997	2	Yes	Low	Unlikely to occur on a regular basis due to urban disturbance and threats; more likely to use surrounding non-urban woodland habitat areas. Closest record 1km east from 1997.
Gallinago hardwickii	Latham's Snipe		Migratory	2008	13	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Hieraaetus morphnoides	Little Eagle	Vulnerable		2004	4	Yes	Low	Unlikely to occur on a regular basis due to urban disturbance and threats; more likely to use surrounding non-urban habitat areas. Closest record 100m south of project from 1999.
Egretta garzetta	Little Egret	Endangered		2007	2	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Anseranas semipalmata	Magpie Goose	Vulnerable		2017	4	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Lophochroa leadbeateri leadbeateri	Major Mitchell's Cockatoo (eastern)	Critically Endangered	Endangered	May occur	0	Yes	Low	Unlikely to occur on a regular basis due to urban disturbance and threats; more likely to use surrounding non-urban habitat areas. Closest record 32km north along the Murray River floodplain woodland habitat.

Scientific Name	Common Name	FFG Act Status	EPBC Act Status	Last Year Observed	Number of Records	Appropriate Habitat	Likelihood of presence	Justification
Biziura lobata	Musk Duck	Vulnerable		2001	5	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable	May occur	0	Yes	Low	Unlikely to occur due to urban habitat disturbance and threats and poor habitat condition. Closest record 50km to southeast from 2001.
Calidris melanotos	Pectoral Sandpiper		Migratory	May occur	0	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Aprasia parapulchella	Pink-tailed Legless Lizard	Endangered	Vulnerable	May occur	0	No	Negligible	Absence of suitable habitat in the project footprint. Closest record 150km east from 2013.
Pedionomus torquatus	Plains-wanderer		Critically Endangered	May occur	0	No	Negligible	Very unlikely to occur due to lack of suitable habitat given poor site condition and urban disturbance and threats.
Ardea intermedia plumifera	Plumed Egret	Critically Endangered		2018	5	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Critically Endangered	May occur	0	Yes	Low	Unlikely to occur on a regular basis due to urban habitat disturbance, threats and poor habitat condition. Nearest record 15km south from 2012.
Myiagra cyanoleuca	Satin Flycatcher		Migratory	May occur	0	Yes	Low	Unlikely to occur on a regular basis due to urban habitat disturbance, threats and poor habitat condition. Nearest record 20km southeast from 1978.
Calidris acuminata	Sharp-tailed Sandpiper		Migratory	May occur	0	No	Low	Absence of suitable habitat in the project footprint but may use adjoining lake and creek areas
Crinia sloanei	Sloane's Froglet	Endangered	Endangered	May occur	0	No	Low	Unlikely to occur due to lack of suitable wetland habitat and poor site understorey condition, urban disturbance and threats. Nearest record 20km southeast from 1995.
Melanodryas cucullata cucullata	South-eastern Hooded Robin		Endangered	May occur	0	Yes	Low	Unlikely to occur on a regular basis due to urban habitat disturbance, threats and poor woodland habitat condition. Nearest record 60km north from 2004 along Murray River Floodplain Forests.
Aphelocephala leucopsis	Southern Whiteface		Vulnerable	1980	2	Yes	Low	Unlikely to occur on a regular basis due to urban habitat disturbance, threats and poor habitat condition. The latest record from 1980 located 2.5 km south of the study area.
Polytelis swainsonii	Superb Parrot	Endangered	Vulnerable	2019	2	Yes	**Medium**	May occur due to suitable woodland habitat features. Nearest record 70m south of site from 2017.
Lathamus discolor	Swift Parrot	Critically Endangered	Critically Endangered	2018	6	Yes	**Medium**	May occur due to suitable woodland habitat features. Nearest record 200m north from 1996 and remaining records all 1km east from Kinnairds Wetland.
Haliaeetus leucogaster	White-bellied Sea-Eagle	Endangered		2005	3	Yes	Low	Unlikely to occur on a regular basis due to urban habitat disturbance, threats and poor habitat condition. Nearest records 1km east from Kinnairds Wetland from 2004 and 2005.

Scientific Name	Common Name	FFG Act Status	EPBC Act Status	Last Year Observed	Number of Records	Appropriate Habitat	Likelihood of presence	Justification
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Vulnerable Migratory	May occur	0	Yes	Low	May occasionally occupy airspace above the study area. Nearest record 12km east from 1977.
Motacilla flava	Yellow Wagtail		Migratory	May occur	0	No	Negligible	Very unlikely as closest Australian record is near Sydney from 2016.

Appendix 3: EPBC Act Significant Impact Assessments

{This page is intentionally blank}

Table A3.1 Swift Parrot - Lathamus discolor (Critically Endangered)

EPBC Act - Significant Impact Criteria	Significant impact likely?	Justification of decision
An action is likely to have a significant impact on a Critically Endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population.	Unlikely	Being a highly mobile and irregular visitor to the Numurkah township (and a migratory species that breeds in Tasmania over Summer); and given the widespread distribution of habitat for the species in the local area and no evidence for the impact site supporting the population, even intermittently, the proposed action is highly unlikely to lead to a long-term decrease in the size of the Swift Parrot populations. Database searches produced very few records for the species within the area, and sightings were older from 1996. Nonetheless, efforts are being made to tailor designs to avoid, minimise and offset the loss of large and medium native feeding/foraging trees.
Reduce the area of occupancy of the species.	Unlikely	As above. No individuals or evidence of Swift Parrot activity was recorded on site or by historical records. Swift Parrots are semi-nomadic foragers and, while the proposed action will remove suitable foraging habitat for the species, the availability of eucalypts in the surrounding landscape and the greater north-east Victoria region will continue to provide alternative foraging habitat. As such, the development proposal is highly unlikely to have a significant impact on the area of occupancy of the species.
Fragment an existing population into two or more populations.	Highly unlikely	The National Recovery Plan for the Swift Parrot states that the species occurs as a single, migratory population. In addition, given the high mobility of the species, the proposed action is unlikely to fragment a population into two or more populations.
Adversely affect habitat critical to the survival of a species.	Unlikely	While the proposed action results in the removal of potential foraging habitat, this habitat is highly disturbed from a result of historical land uses and subject to edge effects from surrounding township development. Swift Parrots breed in Tasmania during summer and migrate to south-eastern Australia in winter. The project is therefore not expected to affect any habitat that is critical to the survival of the species due to their ability to find and use other feeding trees in the broader local area.
Disrupt the breeding cycle of a population.	Highly unlikely	Swift Parrots breed in Tasmania during the summer and after, the entire population mitigates north to the wide expanse of mainland southeast Australia to forage for winter. As such, the project will not disrupt the breeding cycle of a population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The project is not expected to affect any habitat to the extent that the species is likely to decline due to the high mobility of the species and ability to find and use other foraging habitat in the local area. Database searches produced very few records for the species within the area, and sightings were older from 1996. Nonetheless, efforts are being made to tailor designs to avoid, minimise and offset the loss of large and medium native feeding/foraging trees.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Unlikely	The site is highly disturbed by introduced species. Through a project CEMP, controls will be in place before, during and after the construction phases of the project to ensure no invasive species are introduced that are harmful to the established Swift Parrot habitat. Although not consider invasive as they are native, there is an ongoing threat of Noisy Miners are one of the biggest threats to Swift Parrots as they are known to aggressively exclude nectivorous birds from sources of nectar. A council trapping program would be beneficial.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in will be in place before, during and after the construction phases of the project to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore, diseases are unlikely to be introduced by the project that may cause the Swift Parrot habitat to decline.
Interfere with the recovery of the species.	Unlikely	The site has not been identified as an important habitat and being a highly mobile, irregular visitor; and given the widespread foraging distribution of habitat for the species in the local area, the proposed action is unlikely to interfere with the recovery of the Swift Parrot.
Summary of Swift Parrot Significant Impact Assessment		
The above assessment indicates that given no evidence for the species was recorded on site that provides sub-optimal foraging habitat only, the proposed action is highly unlikely to have a significant impact on the Swift Parrot. If Swift Parrots are identified within the study area during construction, all construction within 200 metres of the birds will be halted until the birds move on from the area.		

Table A3.2 Brown Treecreeper - Climacteris picumnus victoriae (Vulnerable)

EPBC Significant Impact Criteria	Significant impact likely?	Justification of decision
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species.	Unlikely	No important population present in the area. So it's unlikely that the proposal may lead to a long-term decrease in the size of the population.
Reduce the area of occupancy of an important population.	Likely	It is unlikely that the proposal may lead to a reduction in occupancy of the species particularly as it is a sedentary species and tends to prefer large, more intact core areas of native bushland.
Fragment an existing important population into two or more populations.	Unlikely	Given the high mobility of the species, and the existing levels of fragmentation along the impact footprint, the proposed action is unlikely to fragment a population into two or more populations.
Adversely affect habitat critical to the survival of a species.	Unlikely	The Broken Creek is not critical to the survival of the Brown Treecreeper and given the high mobility of the species, the proposed action is therefore not expected to affect any habitat that is critical to the survival of the species due to their ability to find and use other feeding trees in the local area.
Disrupt the breeding cycle of an important population.	Likely	It is considered possible that the proposal may disrupt the breeding cycle of a population to some extent if they are present during construction, as the Brown Treecreeper is a likely resident of the impact site and is sedentary. To avoid impacts, if Brown Treecreepers are found on site, works should be conducted outside of fledgling season (July to February). If Brown Treecreepers are observed during pre-clearance checks, works must not proceed until the birds complete their breeding cycle or until after they move on from the the area.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Likely	It is considered possible that the proposal may decrease the availability or quality of habitat to the extent that the species is likely to decline as the Brown Treecreeper is a likely resident of the impact site and is sedentary. Efforts have been made to tailor designs to avoid, minimise and offset the loss native trees for their preservation. It is recommended that Council erect nest boxes with hollows of varying size, to replace lost hollow habitat that is resulting from the construction. It is important that a number of nest boxes have entry hole dimensions that suit Brown Treecreeper, to ensure they have some nesting habitat in the study area.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable specie's habitat.	Unlikely	The site is highly disturbed by introduced species. Through a project CEMP, controls will be in place before, during and after the construction phases of the project to ensure no invasive species are introduced that are harmful to the established Brown Treecreeper habitat.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in will be in place before, during and after the construction phases of the project to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore, diseases are unlikely to be introduced by the project that may cause the Brown Treecreeper habitat to decline.
Interfere substantially with the recovery of the species.	Unlikely	It is unlikely that the proposal may interfere with the recovery of the Brown Treecreeper.
Summary of Brown Treecreeper Significant Impact Assessment		
The above assessment indicates that the proposed action is unlikely to have a significant impact on the Brown Treecreeper. Therefore, a pre-referral meeting with the Commonwealth Department of Agriculture, Water and Environment (DAWE) is not recommended to take place prior to proceeding with a formal referral application under the EPBC Act. If individuals are identified within the construction footprint, all construction within 200 metres will be halted until they move on from the area.		

Table* A3.3 *Grey-headed Flying-fox - Pteropus poliocephalus (Vulnerable)

EPBC Act Significant Impact Criteria	Significant impact likely?	Justification of decision
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species.	Unlikely	There is one regular Grey-headed Flying-fox camp made up of ~500 individuals located 140 metres south of the project impact footprint in the mature riparian Redgums that buffer the Broken Creek. This significant camp has been intentionally avoided and widely buffered by the project and therefore is highly unlikely lead to a long-term decrease in the size of the local Grey-headed Flying-fox population. While the proposed action will remove suitable foraging habitat for the species, the high mobility of the species to travel long distances (up to 50 kilometres in a night) and the availability of other feeding trees in the surrounding local area (particularly commercial orchards) will continue to provide alternative foraging habitat. As such, the development is unlikely to lead to a long-term decrease in the size of the local Grey-headed Flying-fox population.
Reduce the area of occupancy of an important population.	Unlikely	As above. The project will therefore be unlikely to cause any reduction to the area of occupancy for the local Grey-headed Flying-fox population. Nonetheless, efforts are being made to tailor designs to avoid, minimise and offset the loss of large and medium native feeding/foraging trees.
Fragment an existing important population into two or more populations.	Unlikely	The Grey-headed Flying-fox camp has been intentionally avoided and widely buffered by 140 metres by the project; also given their unwillingness to disperse with urban disruption during the day, and the short levee construction timeframe, it is unlikely the proposed action will fragment a population into two or more populations. Furthermore, the high mobility of the species to travel long distances (up to 50 kilometres in a night) and the availability of other feeding trees in the surrounding local area (particularly commercial orchards) will continue to provide alternative foraging habitat.
Adversely affect habitat critical to the survival of a species.	Unlikely	As above. The habitat within the impact footprint is not considered to be critical to the survival of the Grey-headed Flying-fox.
Disrupt the breeding cycle of an important population.	Unlikely	Grey-headed Flying-foxes camps typically start mating in Autumn and give birth in Spring. Young are capable of sustained flight by January and fully weaned by February. The Grey-headed Flying-fox camp has been intentionally avoided and widely buffered by 140 metres by the project; also given their unwillingness to disperse with urban disruption during the day, and the short levee construction timeframe, it is unlikely the proposed action will disrupt the breeding cycle of the local Grey-headed Flying-fox camp. If individuals are identified within the project footprint during construction, all construction within 200 metres will be halted until they move on from the area. There will be a project CEMP put in place to help minimise noise and dust issues and other measures to minimise environmental disturbance.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	The project is not expected to affect any habitat to the extent that the species is likely to decline due to the high mobility of the species and ability to find and use other foraging habitat in the local area, and the avoidance and wide buffering of the known camp. Also, efforts are being made to tailor designs to avoid, minimise and offset the loss of large and medium native feeding/foraging trees.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable specie's habitat.	Unlikely	The site is highly disturbed by introduced species. Through a project CEMP, controls will be in place before, during and after the construction phases of the project to ensure no invasive species are introduced that are harmful to the established habitat.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in will be in place before, during and after the construction phases of the project to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore, diseases are unlikely to be introduced by the project that may cause the habitat to decline.
Interfere substantially with the recovery of the species.	Unlikely	As the known camp is being protected and avoided, the proposed action is unlikely to to interfere with the recovery of the species.
Summary of Grey-headed Flying-fox Significant Impact Assessment		
The above assessment indicates that the proposed action is unlikely to have a significant impact on the Grey-headed Flying-fox. If		

EPBC Act Significant Impact Criteria	Significant impact likely?	Justification of decision
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
individuals are identified within the impact footprint during construction, all construction within 200 metres will be halted until they move on from the area.		

Table *A3.4 Superb Parrot - Polytelis swainsonii (Vulnerable)*

EPBC Significant Impact Criteria	Significant impact likely?	Justification of decision
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population of a species.	Unlikely	Superb Parrots are an open woodland species relying on the Riverine Forests and Box-Gum Woodlands endemic to inland south-eastern Australia. Database searches produced three recent records for the species within a 5-kilometre radius of the site. Being a highly mobile, irregular visitor to the Numurkah township and given the widespread distribution of foraging habitat for the species in the local area depending on resource availability where they may travel as far as 10km; and no evidence for the impact footprint supporting a population on a regular basis for foraging and breeding. As such, the proposed action is unlikely to lead to a long-term decrease in the size of Superb Parrot populations.
Reduce the area of occupancy of an important population.	Unlikely	As above. While the proposed action will remove suitable foraging habitat for the species, the availability of eucalypts in the surrounding local landscape will continue to provide alternative foraging habitat. The majority of the breeding occurs in the nearby Barmah-Millewa Forests (~30 kilometres away). As such, the development proposal is unlikely to have a significant impact on the area of occupancy of the species.
Fragment an existing important population into two or more populations.	Unlikely	Given the lack of local records in a 5-kilometre radius, there is no evidence that the impact footprint supports a Superb Parrot population on a regular basis for foraging and/or breeding. Also, given the high mobility of the species, the widespread distribution of foraging habitat and narrow strip of loss, the proposed action is unlikely to fragment a population into two or more populations.
Adversely affect habitat critical to the survival of a species.	Unlikely	As above. Therefore, the project is unlikely to affect any habitat that is critical to the survival of the species as they are most likely only using the site for irregular foraging habitat. While the proposed action results in the removal of potential foraging habitat, this habitat is subject to edge effects from surrounding township development. The project does not impact the Barmah-Millewa Forest that are considered critical to the Superb Parrot conservation for breeding and foraging.
Disrupt the breeding cycle of an important population.	Unlikely	As above. Therefore, the project is unlikely to disrupt the breeding cycle of a population as the project does not impact the Barmah-Millewa Forest. Additionally, most trees considered indirectly lost by the project from TPZ impacts will be retained if outside the impact footprint regardless, for biodiversity benefits such as potential foraging or nesting habitat.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	As above. Given the lack of local records in a 5- kilometre radius, there is no evidence that the impact footprint supports a Superb Parrot population on a regular basis for foraging and/or breeding. The project is unlikely to affect any habitat to the extent that the species is likely to decline as due to the high mobility of the species and narrow loss zone affected (mostly less than 7 to 15m wide).
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable specie's habitat.	Unlikely	The site is highly disturbed by introduced species. Through a project CEMP, controls will be in place before, during and after the construction phases of the project to ensure no invasive species are introduced that are harmful to the established habitat.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in will be in place before, during and after the construction phases of the project to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore, diseases are unlikely to be introduced by the project that may cause the habitat to decline.
Interfere substantially with the recovery of	Unlikely	The site has not been identified as an important habitat and being a highly mobile, irregular visitor; and given the widespread distribution of foraging habitat for the species in the local area, the proposed action is unlikely to to interfere with the recovery of the species.

EPBC Significant Impact Criteria	Significant impact likely?	Justification of decision
An action is likely to have a significant impact on a Vulnerable species if there is a real chance or possibility that it will:		
the species.		
Summary of Superb Parrot Significant Impact Assessment		
The above assessment indicates that the proposed action is unlikely to have a significant impact on the Superb Parrot. If individuals are identified within the construction footprint, all construction within 200 metres will be halted until they move on from the area.		

Appendix 5: Photos of Lost Vegetation

Photo 1: Levee Section 1 - Habitat Zone 1-A. Tree Waypoint No. 729, 730 and 731. Photo: K. Hill 2023.

Photo 2: Levee Section 1 - Scattered Tree Waypoint No. 727. Photo: K. Hill 2023.

Photo 3: Levee Section 1 - Scattered Tree Waypoint No. 728. Photo: K. Hill 2023.

Photo 4: Levee Section 2 – Habitat Zone 2-A. Photo: K. Hill 2023.

Photo 5: Levee Section 2 – Habitat Zone 2-A. Photo: K. Hill 2023.

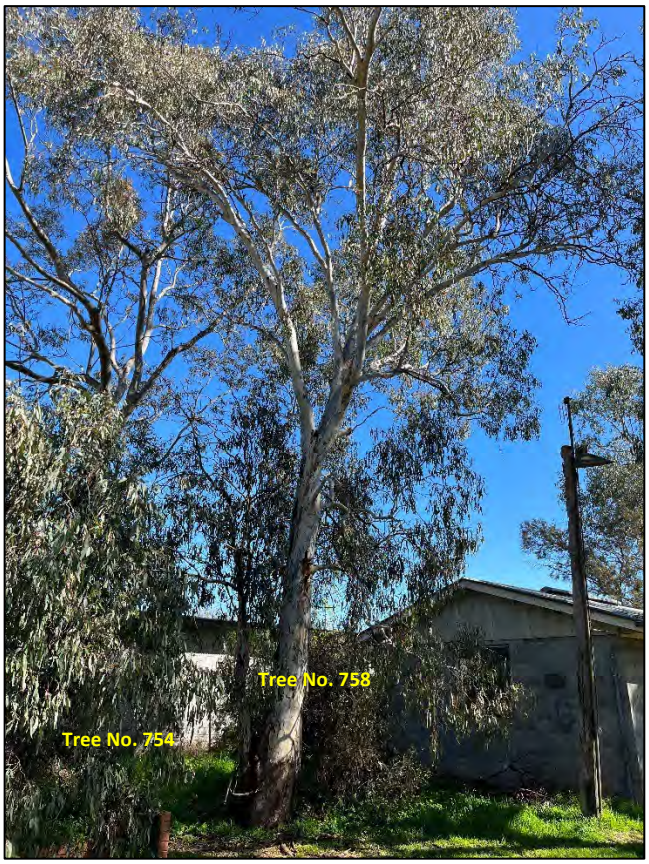


Photo 6: Levee Section 2 - Habitat Zone 2-B - Photo: K. Hill 2023

Photo 7: Levee Section 2 - Habitat Zone 2-C -Scattered Tree Waypoint Number No. 776. Photo: K. Hill 2023.

Photo 8: Levee Section 2 - Habitat Zone 2-x=B – Tree Waypoint No. 775 and 776. Photo: K. Hill 2023.

Photo 9: Levee Section 3 - Habitat Zone 3-B – Tree Waypoint No. 786 and 787. Photo: K. Hill 2023.

Photo 10: Levee Section 3 - Habitat Zone 3-A. Photo: K. Hill 2023.

Photo 11: Levee Section 3 - Habitat Zone 3-C – Tree Waypoint No. 838. Photo: K. Hill 2023.

Photo 12: Levee Section 3 - Habitat Zone 3-D – Tree Waypoint No. 848. Photo: K. Hill 2023.

Photo 13: Levee Section 3 - Habitat Zone 3-E. Photo: K. Hill 2023.

Photo 14: Levee Section 3 - Habitat Zone 3-F. Photo: K. Hill 2023.

Photo 15: Levee Section 3 - Habitat Zone 3. Photo: K. Hill 2023.

Photo 16: Levee Section 4 - Habitat Zone 4-A. Photo: K. Hill 2023.

Photo 17: Levee Section 4 - Habitat Zone 4B. Photo: K. Hill 2023.

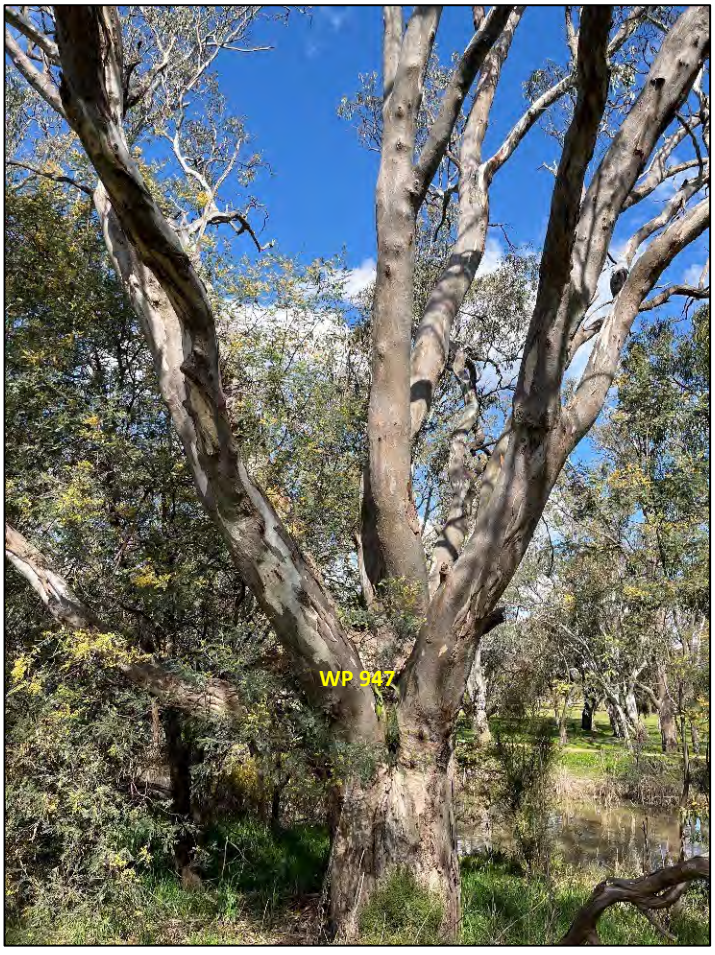


Photo 18: Levee Section 4 - Habitat Zone 4C. Photo: K. Hill 2023.

Photo 19: Levee Section 4 - Habitat Zone 4 -D. Photo: K. Hill 2023.

Photo 20: Levee Section 4 - Habitat Zone 4 -E. Photo: K. Hill 2023.

Photo 21: Levee Section 4 - Habitat Zone 4 -F. Photo: K. Hill 2023.

Photo 22: Levee Section 5 - Habitat Zone 5-A. Photo: K. Hill 2023.

Photo 23: Levee Section 5 - Habitat Zone 5-B. Photo: K. Hill 2023.

Appendix 6: Native Vegetation Removal Report

Native vegetation removal report

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report **is not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: **08/12/2023**
Time of issue: **1:45 pm**

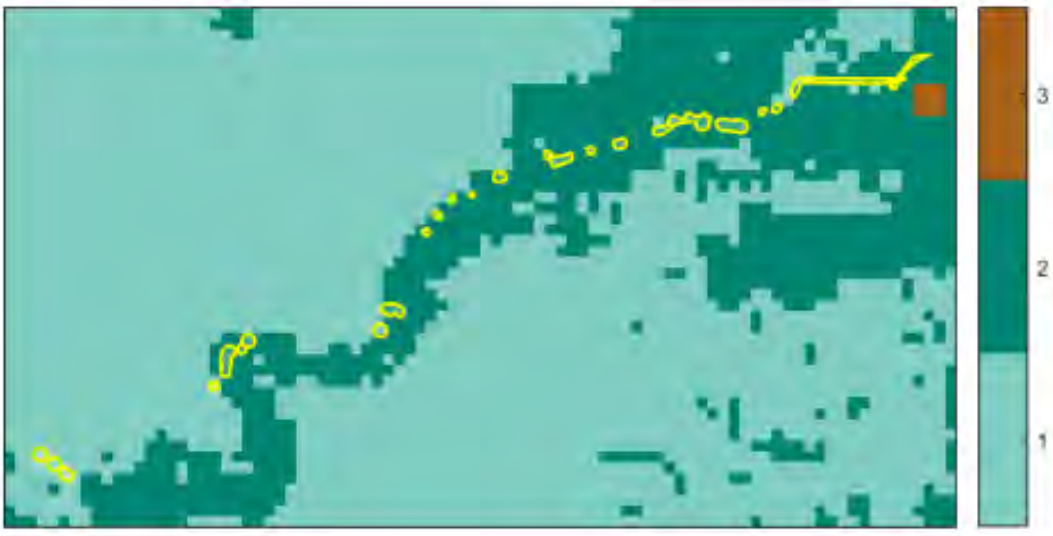
Report ID: RGE_2023_028

Project ID	DELWP_REMOVAL_TEMPLATE_FINAL__ENSYM3_VICGRID94_FINAL

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	1.857 ha
Extent of past removal	0.000 ha
Extent of proposed removal	1.857 ha
No. Large trees proposed to be removed	22
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map); and a wetland listed in the Directory of Important Wetlands of Australia. Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

1. Location map



VICTORIA State Government | Environment, Land, Water and Planning

Page 1

OFFICIAL

Native vegetation removal report

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	0.597 general habitat units
Vicinity	Goulburn Broken Catchment Management Authority (CMA) or Moira Shire Council
Minimum strategic biodiversity value score[2]	0.486
Large trees	22 large trees

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required.

Native vegetation removal report

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed Assessment Pathway.

If you wish to remove the mapped native vegetation you are required to apply for a permit from your local council. Council will refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native* vegetation (the Guidelines) for a full list of application requirements This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (partly met)
- Maps showing the native vegetation and property (partly met)
- Information about the impacts on rare or threatened species.
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including.

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defendable space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- A site assessment report including a habitat hectare assessment of any patches of native vegetation and details of trees
- An offset statement that explains that an offset has been identified and how it will be secured.

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

Species habitat units = extent x condition x species landscape factor x 2, where the species landscape factor = 0.5 + (habitat importance score/2)

The species offset amount(s) required is the sum of all species habitat units per zone.

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-A	Patch	vriv0803	Endangered	2	no	0.230	0.068	0.068	0.623		0.019	General
2-A	Patch	vriv0055_61	Endangered	3	no	0.130	0.162	0.162	0.270		0.020	General
4-E	Patch	vriv0055_61	Endangered	5	no	0.330	0.173	0.173	0.900		0.081	General
4-D	Patch	vriv0055_61	Endangered	3	no	0.330	0.259	0.259	0.900		0.122	General
4-C	Patch	vriv0055_61	Endangered	1	no	0.330	0.057	0.057	0.884		0.027	General
4-A	Patch	vriv0055_61	Endangered	2	no	0.330	0.118	0.118	0.870		0.055	General
3-G	Patch	vriv0055_61	Endangered	1	no	0.260	0.055	0.055	0.296		0.014	General
3-A	Patch	vriv0055_61	Endangered	1	no	0.260	0.113	0.113	0.870		0.041	General
3-B	Patch	vriv0055_61	Endangered	1	no	0.260	0.070	0.070	0.870		0.026	General
5-A	Patch	vriv0055_61	Endangered	0	no	0.220	0.340	0.340	0.387		0.078	General
4-F	Patch	vriv0055_61	Endangered	0	no	0.330	0.028	0.028	0.900		0.013	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
4-B	Patch	vrix0055_61	Endangered	0	no	0.330	0.022	0.022	0.870		0.010	General
3-F	Patch	vrix0055_61	Endangered	0	no	0.260	0.009	0.009	0.870		0.003	General
3-E	Patch	vrix0055_61	Endangered	0	no	0.260	0.018	0.018	0.870		0.007	General
3-D	Patch	vrix0055_61	Endangered	0	no	0.260	0.024	0.024	0.870		0.009	General
3-C	Patch	vrix0055_61	Endangered	0	no	0.260	0.018	0.018	0.557		0.005	General
2-B	Patch	vrix0055_61	Endangered	0	no	0.130	0.031	0.031	0.270		0.004	General
5-B	Patch	vrix0055_61	Endangered	0	no	0.330	0.031	0.031	0.531		0.012	General
2-C	Scattered Tree	vrix0055_61	Endangered	0	no	0.200	0.031	0.031	0.270		0.006	General
1-B	Scattered Tree	vrix0803	Endangered	1	no	0.200	0.070	0.070	0.174		0.012	General
1-C	Scattered Tree	vrix0803	Endangered	1	no	0.200	0.070	0.070	0.180		0.012	General
2-D	Scattered Tree	vrix0055_61	Endangered	1	no	0.200	0.070	0.070	0.270		0.013	General
4-G	Patch	vrix0055_61	Endangered	0	no	0.330	0.016	0.016	0.900		0.008	General

OFFICIAL

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Flat-headed Galaxias	*Galaxias rostratus*	4692	Vulnerable	Dispersed	Habitat importance map	0.0009
Freshwater Catfish	*Tandanus tandanus*	528545	Endangered	Dispersed	Habitat importance map	0.0008
Murray-Darling Rainbowfish	*Melanotaenia fluviatilis*	4774	Vulnerable	Dispersed	Habitat importance map	0.0007
Silver Perch	*Bidyanus bidyanus*	528544	Vulnerable	Dispersed	Habitat importance map	0.0007
Water Shield	*Brasenia schreberi*	500487	Vulnerable	Dispersed	Habitat importance map	0.0007
Murray River Turtle	*Emydura macquarii*	5135	Vulnerable	Dispersed	Habitat importance map	0.0006
Murray Cod	*Maccullochella peelii*	4871	Vulnerable	Dispersed	Habitat importance map	0.0005
Southern Pygmy Perch (Murray-Darling lineage)	*Nannoperca australis (Murray-Darling lineage)*	903231	Vulnerable	Dispersed	Habitat importance map	0.0004
Wavy Marshwort	*Nymphoides crenata*	502287	Vulnerable	Dispersed	Habitat importance map	0.0004
Broad-shelled Turtle	*Chelodina expansa*	5133	Endangered	Dispersed	Habitat importance map	0.0004
Superb Parrot	*Polytelis swainsonii*	10277	Endangered	Dispersed	Habitat importance map	0.0003
Yarran Wattle	*Acacia omalophylla*	500069	Endangered	Dispersed	Habitat importance map	0.0003
Gull-billed Tern	*Gelochelidon nilotica macrotarsa*	10111	Endangered	Dispersed	Habitat importance map	0.0002
Silky Umbrella-grass	*Digitaria ammophila*	501041	Vulnerable	Dispersed	Habitat importance map	0.0002
Australian Painted Snipe	*Rostratula australis*	10170	Critically endangered	Dispersed	Habitat importance map	0.0001
Blue Burr-daisy	*Calotis cuneifolia*	500594	Rare	Dispersed	Habitat importance map	0.0001
Northern Sandalwood	*Santalum lanceolatum*	503005	Endangered	Dispersed	Habitat importance map	0.0001
Veiled Fringe-sedge	*Fimbristylis velata*	501369	Rare	Dispersed	Habitat importance map	0.0001

Pale Flax-lily	*Dianella sp. aff. longifolia (Riverina)*	507399	Vulnerable	Dispersed	Habitat importance map	0.0001
Riverina Bitter-cress	*Cardamine moirensis*	505032	Rare	Dispersed	Habitat importance map	0.0001
Jericho Wire-grass	*Aristida jerichoensis var. subspinulifera*	504631	Endangered	Dispersed	Habitat importance map	0.0001
Pepper Grass	*Panicum laevinode*	504808	Vulnerable	Dispersed	Habitat importance map	0.0001
Yellow-tongue Daisy	*Brachyscome chrysoglossa*	503654	Vulnerable	Dispersed	Habitat importance map	0.0001
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	10226	Vulnerable	Dispersed	Habitat importance map	0.0001
Squirrel Glider	*Petaurus norfolcensis*	11137	Endangered	Dispersed	Habitat importance map	0.0001
Australian Little Bittern	*Ixobrychus dubius*	10195	Endangered	Dispersed	Habitat importance map	0.0001
Intermediate Egret	*Ardea intermedia*	10186	Endangered	Dispersed	Habitat importance map	0.0001
Eastern Great Egret	*Ardea modesta*	10187	Vulnerable	Dispersed	Habitat importance map	0.0001
Stiff Groundsel	*Senecio behrianus*	503101	Endangered	Dispersed	Habitat importance map	0.0001
Grey-crowned Babbler	*Pomatostomus temporalis temporalis*	10443	Endangered	Dispersed	Habitat importance map	0.0001
Small Scurf-pea	*Cullen parvum*	502773	Endangered	Dispersed	Habitat importance map	0.0001
Australasian Bittern	*Botaurus poiciloptilus*	10197	Endangered	Dispersed	Habitat importance map	0.0001
Growling Grass Frog	*Litoria raniformis*	13207	Endangered	Dispersed	Habitat importance map	0.0001
Baillon's Crake	*Porzana pusilla palustris*	10050	Vulnerable	Dispersed	Habitat importance map	0.0001
Little Egret	*Egretta garzetta nigripes*	10185	Endangered	Dispersed	Habitat importance map	0.0001
Bush Stone-curlew	*Burhinus grallarius*	10174	Endangered	Dispersed	Habitat importance map	0.0001
Umbrella Grass	*Digitaria divaricatissima var. divaricatissima*	501045	Vulnerable	Dispersed	Habitat importance map	0.0001
Rye Beetle-grass	*Tripogon loliiformis*	503455	Rare	Dispersed	Habitat importance map	0.0001
Dwarf Bitter-cress	*Rorippa eustylis*	502944	Rare	Dispersed	Habitat importance map	0.0001
Hardhead	*Aythya australis*	10215	Vulnerable	Dispersed	Habitat importance map	0.0001
Brolga	*Grus rubicunda*	10177	Vulnerable	Dispersed	Habitat importance map	0.0001

Floodplain Fireweed	*Senecio campylocarpus*	507136	Rare	Dispersed	Habitat importance map	0.0001
Smooth Minuria	*Minuria integerrima*	502201	Rare	Dispersed	Habitat importance map	0.0001
Long Eryngium	*Eryngium paludosum*	501238	Vulnerable	Dispersed	Habitat importance map	0.0001
Bent-leaf Wattle	*Acacia flexifolia*	500035	Rare	Dispersed	Habitat importance map	0.0001
Delicate Crane's-bill	*Geranium sp. 6*	505347	Vulnerable	Dispersed	Habitat importance map	0.0001
Blue-billed Duck	*Oxyura australis*	10216	Endangered	Dispersed	Habitat importance map	0.0001
Pale Swamp Everlasting	*Coronidium gunnianum*	504655	Vulnerable	Dispersed	Habitat importance map	0.0000
Musk Duck	*Biziura lobata*	10217	Vulnerable	Dispersed	Habitat importance map	0.0000
Freckled Duck	*Stictonetta naevosa*	10214	Endangered	Dispersed	Habitat importance map	0.0000
Dark Wire-grass	*Aristida calycina var. calycina*	503630	Rare	Dispersed	Habitat importance map	0.0000
Australasian Shoveler	*Anas rhynchotis*	10212	Vulnerable	Dispersed	Habitat importance map	0.0000
Lewin's Rail	*Lewinia pectoralis pectoralis*	10045	Vulnerable	Dispersed	Habitat importance map	0.0000
Dookie Daisy	*Brachyscome gracilis*	505494	Vulnerable	Dispersed	Habitat importance map	0.0000
Painted Honeyeater	*Grantiella picta*	10598	Vulnerable	Dispersed	Habitat importance map	0.0000
Southern Swainson-pea	*Swainsona behriana*	504944	Rare	Dispersed	Habitat importance map	0.0000
Rosemary Grevillea	*Grevillea rosmarinifolia subsp. rosmarinifolia*	504066	Rare	Dispersed	Habitat importance map	0.0000
Striped Water-milfoil	*Myriophyllum striatum*	503869	Vulnerable	Dispersed	Habitat importance map	0.0000
Late-flower Flax-lily	*Dianella tarda*	505085	Vulnerable	Dispersed	Habitat importance map	0.0000
Carpet Python	*Morelia spilota metcalfei*	62969	Endangered	Dispersed	Habitat importance map	0.0000
Silky Swainson-pea	*Swainsona sericea*	504946	Vulnerable	Dispersed	Habitat importance map	0.0000
Branching Groundsel	*Senecio cunninghamii var. cunninghamii*	503104	Rare	Dispersed	Habitat importance map	0.0000
Slender Club-sedge	*Isolepis congrua*	501773	Vulnerable	Dispersed	Habitat importance map	0.0000
Small Burr-grass	*Tragus australianus*	503418	Rare	Dispersed	Habitat importance map	0.0000
Fuzzy New Holland Daisy	*Vittadinia cuneata var. morisii*	505060	Rare	Dispersed	Habitat importance map	0.0000

Broom Bitter-pea	*Daviesia genistifolia s.s.*	503813	Rare	Dispersed	Habitat importance map	0.0000
Yellow Burr-daisy	*Calotis lappulacea*	500598	Rare	Dispersed	Habitat importance map	0.0000
Barking Owl	*Ninox connivens connivens*	10246	Endangered	Dispersed	Habitat importance map	0.0000
Brown Toadlet	*Pseudophryne bibronii*	13117	Endangered	Dispersed	Habitat importance map	0.0000
Regent Honeyeater	*Anthochaera phrygia*	10603	Critically endangered	Dispersed	Habitat importance map	0.0000
Dwarf Brooklime	*Gratiola pumilo*	503753	Rare	Dispersed	Habitat importance map	0.0000
Waterbush	*Myoporum montanum*	502240	Rare	Dispersed	Habitat importance map	0.0000
Hairy Tails	*Ptilotus erubescens*	502825	Vulnerable	Dispersed	Habitat importance map	0.0000
Lanky Buttons	*Leptorhynchos elongatus*	501941	Endangered	Dispersed	Habitat importance map	0.0000
Buloke Mistletoe	*Amyema linophylla subsp. orientalis*	500217	Vulnerable	Dispersed	Habitat importance map	0.0000
Downy Swainson-pea	*Swainsona swainsonioides*	503328	Endangered	Dispersed	Habitat importance map	0.0000
Ausfeld's Wattle	*Acacia ausfeldii*	500013	Vulnerable	Dispersed	Habitat importance map	0.0000
Kamarooka Mallee	*Eucalyptus froggattii*	501279	Rare	Dispersed	Habitat importance map	0.0000
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0000
Square-tailed Kite	*Lophoictinia isura*	10230	Vulnerable	Dispersed	Habitat importance map	0.0000
Lace Monitor	*Varanus varius*	12283	Endangered	Dispersed	Habitat importance map	0.0000
Bearded Dragon	*Pogona barbata*	12177	Vulnerable	Dispersed	Habitat importance map	0.0000
Buloke	*Allocasuarina luehmannii*	500678	Endangered	Dispersed	Habitat importance map	0.0000
Forest Bitter-cress	*Cardamine papillata*	505034	Vulnerable	Dispersed	Habitat importance map	0.0000
Red Swainson-pea	*Swainsona plagiotropis*	503324	Endangered	Dispersed	Habitat importance map	0.0000
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*	10498	Vulnerable	Dispersed	Habitat importance map	0.0000
Grey Falcon	*Falco hypoleucos*	10236	Endangered	Dispersed	Habitat importance map	0.0000
White-throated Needletail	*Hirundapus caudacutus*	10334	Vulnerable	Dispersed	Habitat importance map	0.0000

Grey-headed Flying-fox	*Pteropus poliocephalus*	11280	Vulnerable	Dispersed	Habitat importance map	0.0000
Dwarf Cassinia	*Cassinia diminuta*	507664	Rare	Dispersed	Habitat importance map	0.0000
Ridged Water-milfoil	*Myriophyllum porcatum*	502257	Vulnerable	Dispersed	Habitat importance map	0.0000
Purple Diuris	*Diuris punctata*	501084	Vulnerable	Dispersed	Habitat importance map	0.0000
Western Golden-tip	*Goodia medicaginea*	501518	Rare	Dispersed	Habitat importance map	0.0000
Powerful Owl	*Ninox strenua*	10248	Vulnerable	Dispersed	Habitat importance map	0.0000
Cottony Cassinia	*Cassinia ozothamnoides*	501560	Vulnerable	Dispersed	Habitat importance map	0.0000
Clover Glycine	*Glycine latrobeana*	501456	Vulnerable	Dispersed	Habitat importance map	0.0000
Swift Parrot	*Lathamus discolor*	10309	Endangered	Dispersed	Habitat importance map	0.0000

Habitat group

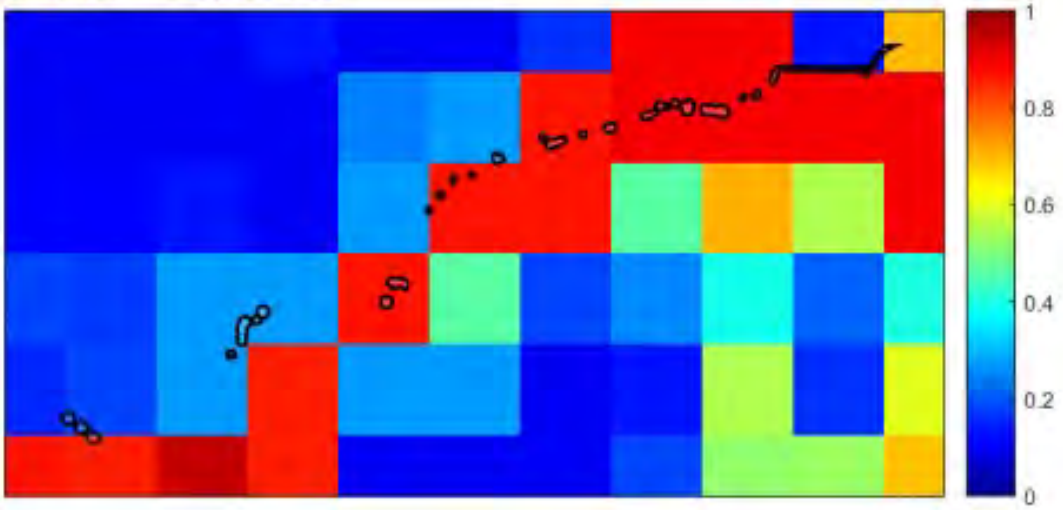
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation

Page 11

4. Map of the property in context

Yellow boundaries denote areas of proposed native vegetation removal.

OFFICIAL

Page 12

Appendix 7: Evidence of Available Native Vegetation Credits

vegetationlink

Our reference: VLQ-9860-D
Your reference: TBA

5 December 2023

Kate Hill
Red-Gum Environmental Consulting
kate.hill@red-gum.com.au

Dear Kate

RE: Quotation for the supply of native vegetation credits

Vegetation Link is an accredited offset provider with the Department of Energy, Environment and Climate Action (DEECA). We offer a specialised brokerage service to enable permit holders and developers to identify suitable native vegetation credits to meet their planning permit offset requirements.

Based on the information you have provided; I understand you require the following native vegetation offset:

Offset type	Vicinity	General habitat units (GHU)	Min. strategic biodiversity value (SBV)	Large trees
General	Goulburn Broken CMA	0.597	0.486	22

To meet your offset requirements, you can purchase native vegetation credits from a third party as per the options quoted below[1]. This quotation is valid for 14 days, subject to credit availability.

Option 1: 2 x 3-Party CTA pathway – offset sites located on Ngurrailliam Country[2] in the Greater Shepparton City area (approx. 3-6 week turnaround from acceptance of quote)

Native Vegetation Credit Fees – Invoiced by DEECA	
Cost of native vegetation credits (0.002 GHU + 22 Large Trees) (ex. GST)	$5,664.00
Cost of native vegetation credits (0.595 GHU) (ex. GST)	$48,790.00
Broker Fee – Invoiced by Vegetation Link	
Cost of broker fee for 2 CTAs (ex. GST)	$2,500.00
Total Credit Trade Fees	
Subtotal Cost (ex. GST)	$56,954.00
Total GST applicable	$5,695.40
Total Cost (inc. GST)	**$62,649.40**

[1] *Note that the broker fee includes the NVOR transfer and allocation fees when an allocation is done at the time of purchase.*

[2] *Traditional Country names sourced from the AIATSIS Map of Indigenous Australia*

Vegetation Link Pty Ltd
ABN: 92 169 702 032
www.vegetationlink.com.au
1800 VEG LINK (1800 834 546) | offsets@vegetationlink.com.au | PO Box 10 Castlemaine VIC 3450

vegetationlink

Option 2: 2 x 3-Party CTA pathway - offset sites located on Ngurrailliam & Taungurong Country[3] in the Strathbogie & Greater Shepparton City areas (approx. 3-6 week turnaround from acceptance of quote)

Native Vegetation Credit Fees – Invoiced by DEECA	
Cost of native vegetation credits (0.002 GHU + 22 Large Trees) (ex. GST)	$6,780.00
Cost of native vegetation credits (0.595 GHU) (ex. GST)	$53,520.25
Broker Fee – Invoiced by Vegetation Link	
Cost of broker fee for 2 CTAs (ex. GST)	$2,500.00
Total Credit Trade Fees	
Subtotal Cost (ex. GST)	$62,800.25
Total GST applicable	$6,280.03
Total Cost (inc. GST)	**$69,080.28**

If you would like to purchase credits, let us know that you accept the quote and return the attached **purchaser details form** by email. If more than one quotation option is provided above, specify which option you choose. Upon receipt of the form, we will begin the trade process. Further details of the process for credit allocation are in the FAQ below.

Should you have any queries, please do not hesitate to contact us on 1300 VEG LINK (1300 834 546) or email offsets@vegetationlink.com.au.

Sincerely,

Lucas Rotteveel
Biodiversity Offset Broker

[3] *Traditional Country names sourced from the AIATSIS Map of Indigenous Australia*

Appendix 9: Arborist Report

BRIGHT VIC

HIGH COUNTRY

ARBORIST REPORTS

Prepared by:
Ben Keys
Consulting Arborist
AQF 5 | Melbourne Polytechnic

Prepared for:
Moira Shire Council c/o
Red-Gum Environmental
Consulting

Arboricultural Impact Assessment & Tree Protection Plan V3.0

Numurkah Flood Plan
Northern Levee Alignment
Numurkah, VIC, 3631

December 12, 2023

To whom it may concern,

On August 28, 2023, the services of High Country Arborist Reports were provided in assessing selected trees at various locations across Numurkah township where the proposed Northern Levee will be constructed.

Version 3.0 of this report was updated December 12, 2023.

This report, as understood by the author is to be submitted to relevant parties regarding planned development of the site and any relationship to the trees present.

Inspection was undertaken by Ben Keys and Red-Gum ecologist/botanist Kate Hill, under calm weather conditions.

This Arboricultural Impact Assessment and Tree Protection Plan includes all measures required to protect the trees on site during all stages of this process. As agreed, this tree report will provide the following information regarding trees assessed:

- Onsite inspection of trees
- Tree identification
- Measurements and photographs (DBH tape, digital photographs)
- Assessment of potential impact to retained trees via the proposed construction project
- Professional recommendations for works (if any), and/or mitigation or changes to construction techniques to allow trees to be retained in accordance with *AS:4970-2009: Protection of Trees on Development Sites*.

NOTE: Prior to reading this report and subsequently following any advice, opinions, recommendations, or findings provided, you must hereby understand and agree to our *Terms of Advice and Service* as provided at the end of the report.

Report inclusions and exclusions, assessment methodology and specifics pertaining to Australian Standards referenced may also be found at the end of the document

Please find the tree report included below.

Contents

1.0 Executive summary

On August 28, 2023, we inspected selected trees at multiple locations around the township of Numurkah. This area is proposed for the construction of the Numurkah Flood Plan Northern Levee. This project involves the construction of mounded-earth levees, plus concrete levee walls located north of Broken Creek. Much of this construction will occur in close proximity to remnant native trees.

1.1 Works relevant to the trees

- Identify and flag trees to be removed
- Conduct fauna survey prior to tree removals
- Construct earth levee and concrete levee walls as per supplied plans

1.2 Construction background

1. The proposed mounded-earth levee will be 1m high, with a 3m wide crest width. Batter slopes either side (3m each) will take the total width to approx. 9m. The levee core will be composed of clay, with batter-fill drawn from existing site material (sandy clay). The clay core will be excavated to a depth of 0.6m before installation and topsoil either side of the core will be stripped to 0.15m. See image page 10.

2. The concrete wall levee will be 1m high with a 0.45m footing on top of 0.15m FCR bedding. Footing will be approx. 1m wide. Total excavation depth required is 0.6m.

3. Both the earth levee and concrete walls will require a construction buffer either side during the build process. This has been set at 3m either side for all modelling of tree losses.

4. Maintenance access is not required for wall sections – all wall sections are adjacent to existing roads. Levee maintenance will occur via vehicle access along the levee itself - the 3m crest will act as walking track/maintenance track/emergency access.

1.3 Trees assessed

5. A total of 462 native trees were assessed on site, the majority of which are remnant vegetation –chiefly *Eucalyptus camaldulensis;* River Red Gum and *Eucalyptus microcarpa;* Grey Box. Trees likely to be impacted by the proposed levee alignment and trees within 15m of the levee footprint were assessed for this report. This also included 27 planted specimens (non-endemic species).

6. All assessed trees are located within the road reserve or on public lands. Trees are therefore Moira Shire council assets and cannot be removed or pruned without council approval.

7. Many trees in close proximity to the levee alignment have the potential to be impacted where their TPZ areas intersect with the levee bank or buffer area. Under DEECA guidelines, "a tree, or trees will be deemed lost if the encroachment (of compaction and excavation) into the TPZ is greater than 10 per cent, or is inside the SRZ." (*DELWP Assessor's handbook).*

8. While multiple trees will incur these indirect impacts, it is the opinion of the inspecting arborist that many trees toward the edges of the levee bank and trees within the buffer zone will remain viable (not to be considered lost). Others will be considered 'lost but retained'.

1.4 Summary of impacts

9. Of the 462 trees assessed on site, 120 will incur major TPZ impacts (>10%), due to their proximity to the levee and/or wall (as per *Australian Standard: Protection of Trees on Development Sites AS:4970-2009).* Fifty-four (54) trees will incur minor impacts (<10%) and a further 261 trees avoid impact altogether.

10. While these 120 trees with major TPZ impacts above 10% could be considered 'lost', we do not believe this is applicable in all cases. This is based on these specimens being located toward the edges of the levee bank or within the construction buffer zone. In the case of the former, small areas of permeable fill laid over the TPZ areas will not create ongoing issues.

11. Trees with TPZ areas that intersect with the construction buffer zone will not experience ongoing impacts from the levee itself. Provided that basic Tree Protection guidelines are followed during construction, these trees will all remain viable.

12. Most of the lost trees can still be retained without removal. We accept the impact is too high to not be considered lost assets, but these trees can still be retained safely in place. Many of these are large, high-value remnant River Red Gums that contribute greatly to the amenity of the area and provide valuable wildlife habitat.

13. There are a further 59 trees where the expected impact is between 10-25%. It is the opinion of the inspecting arborist that these trees need not be considered 'lost assets' despite

impacts >10%. The root systems of these trees will remain undisturbed by excavation – all are outside of the excavation footprint – and we expect them to remain viable. Tree Protection measures are outlined below to ensure the longevity of these specimens.

14. Given the above, we can support the progression of this proposal. It is the opinion of the inspecting arborist that no retained trees will be negatively affected. A total of 61 trees can be considered lost, while a further 59 impacted trees need not be considered 'lost assets' as per the DEECA guidelines.

15. Ten trees will be required to be removed for this project to proceed as planned. In all cases, these are trees whose location is incompatible with the proposed levee and/or wall alignment. In many cases these are trees with trunks located inside the levee bank. Tree numbers 727, 728, 754, 770, 775, 786, 801, 848, 1057 and 1127 will be required to be removed and offset under Moira Shire *Native Vegetation Guidelines Clause 52.17.*

16. Summary of tree impacts/outcomes (462 trees total):

Type impact	Impact avoided	Impact <10%	Impact <25%	Lost	Planted tree
Tree volume	261	54	59	61	27

1.5 Tree Protection Plan guidelines

1. To ensure the success of this project, it will be necessary to follow specific construction guidelines that ensure trees in close proximity to the levee footprint do not suffer negative long-term health effects.

2. All trees approved for removal must be identified and marked to ensure that there is no confusion between trees being removed and retained. Any trees to be removed should be subject to a pre-clearing survey, specifically directed towards detecting any roosting or nesting fauna.

3. Trees to be removed must be felled in such a way as to avoid falling into and damaging adjacent vegetation outside the construction footprint.

4. We understand this project will require significant civil works – excavation and movement of soil. Heavy machinery must be positioned outside of TPZ areas and 'boom-in' for excavation or fill operations. A spotter must be used to avoid machinery impacts with retained trees.

5. We recommend all heavy machinery travels along the levee footprint where possible to avoid soil compaction in the TPZ area of retained trees.

6. Trees requiring pruning must only be pruned by council-approved contractors, in accordance with *AS4373-2007*.

7. No construction materials or equipment should be stored within the TPZ areas of retained trees. All vehicles should use levee footprint or adjacent roads for access to avoid soil compaction.

8. The correct implementation of the below Tree Protection Plan will prevent access, procedural or storage-related damage to the trunks, canopies, or roots of the trees present on this site.

2.0 Purpose of this report

The purpose of this report is to provide the findings of an independent assessment of the trees occupying the aforementioned area and to provide an arboricultural impact assessment and impact mitigation advice.

This report has been prepared in accordance with *AS4970-2009: Protection of Trees on Development Sites* and *AS4373-2007: Pruning of Amenity Trees*.

Demolition and construction works can negatively affect retained trees both directly through mechanical injury and indirectly in ways that are not evident immediately but affect the health of the tree in the long term.

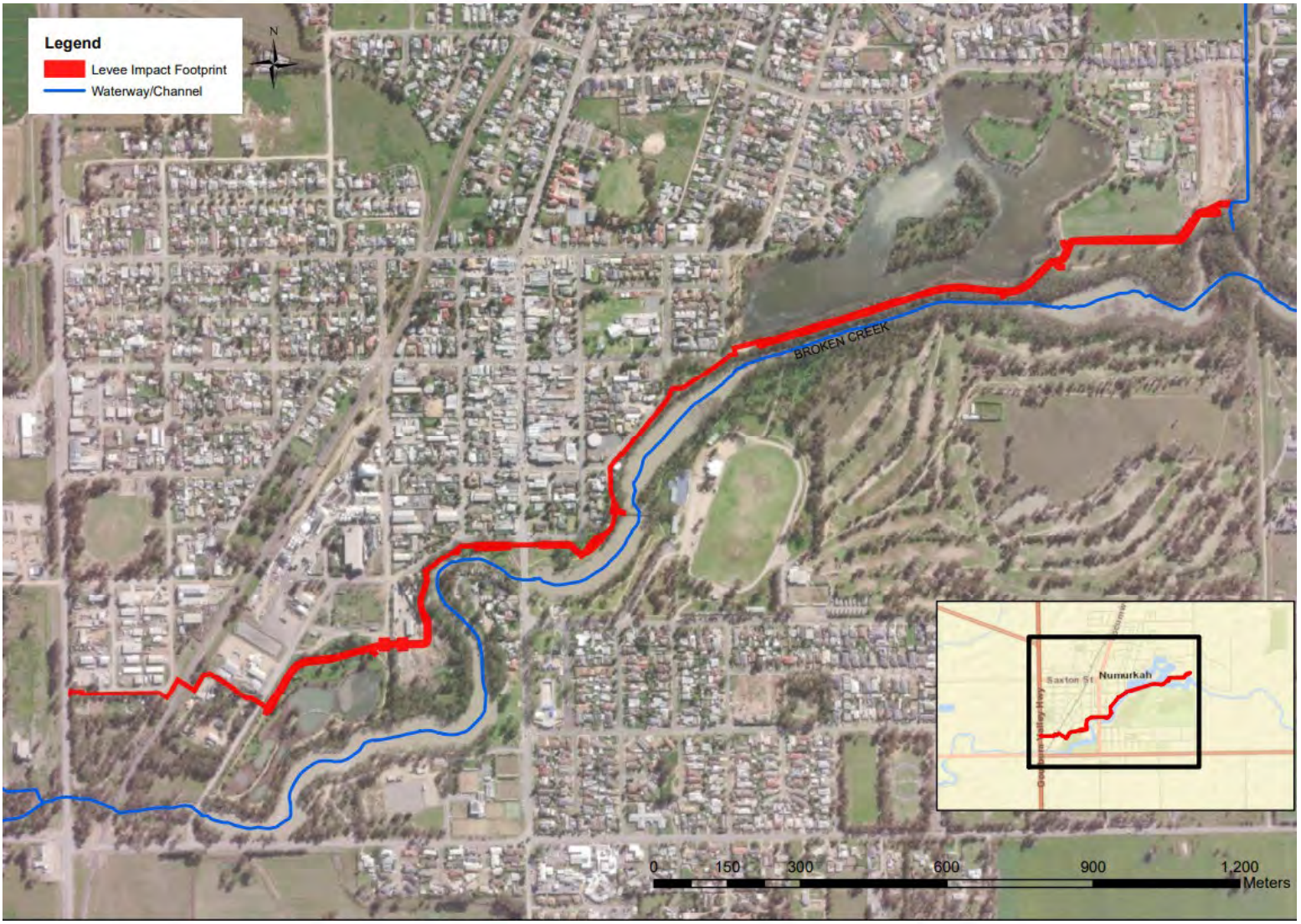
It is for this reason that a Tree Protection Plan should be implemented and adhered to throughout the entire development process.

2.1 Documents relevant to this report

- *Australian Standard: Protection of Trees on Development Sites AS4970-2009*
- *Australian Standard: Pruning of Amenity Trees AS4373-2007*
- Site proposal / plans
- DELWP "Assessor's handbook: Applications to remove, destroy or lop native vegetation"
- Moira Shire council *Native Vegetation Guidelines Clause 52.17*
- "Moira Shire council Numurkah Flood Plain Levee Bank Survey and Design": CAF Consulting

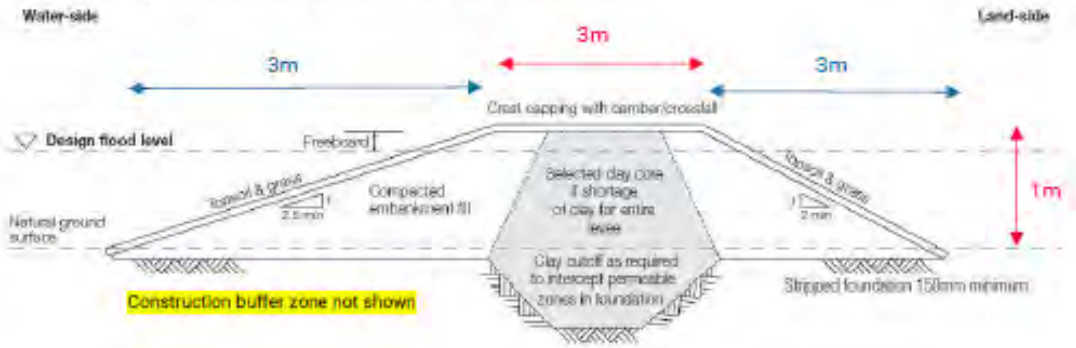
3.0 Site observations

Project involves multiple sites across Numurkah township. Levee alignment will largely be located north of Broken Creek. Overview below has been slightly modified. See detailed plan at rear.



4.0 Levee construction

Figure 3: Components of a typical permanent earthen levee bank



4.1 Construction detail

LEVEE

- The proposed mounded-earth levee will be 1m high, with a 3m wide crest width.
- 3m batter slopes either side will take the total width to approx. 9m.
- The levee core will be composed of clay, with batter-fill drawn from existing site material (sandy clay).
- The clay core will be excavated to a depth of 0.6m before installation and topsoil either side of the core will be stripped to 0.15m.

WALL

- The concrete wall levee will be 1m high with a 0.45m footing on top of 0.15m FCR bedding.
- Footing will be approx. 1m wide. Total excavation depth required is 0.6m.

5.0 Tree Protection Plan

5.1 Pre-Construction

5.1.1 Site induction

Construction manager and all contractors to meet on-site prior to site preparation to introduce the Tree Protection Plan. The Tree Protection Plan induction must be attended by all contractors.

5.1.2 Tree pruning

Any pruning requests must be submitted to the determining authority, subsequently authorized, and only conducted by council-approved contractors who are also qualified arborists in accordance with *AS4373-2007, Pruning of Amenity Trees*.

5.1.3 Tree Protection

All trees being removed must be identified and marked to ensure that there is no confusion between trees being removed and retained.

5.2 Construction

5.2.1 Excavation and civil works

Heavy machinery must use existing levee footprint for access where possible. Vehicles/machinery are not to be driven across TPZ areas of retained trees.

For areas requiring site fill, this should be clean fill sourced locally. Excavators must not track across TPZ areas. Heavy machinery must be positioned outside of TPZ areas and 'boom-in' for excavation or fill operations.

No construction materials or equipment should be stored within the TPZ areas of retained trees. All vehicles and machinery to use existing levee footprint for access to avoid soil compaction.

5.3 TPP technical requirements

5.3.1 Protection of Trees On Development Sites: AS 4970-2009

This TPMP has been prepared in accordance with *Australian Standard 4970-2009: Protection of Trees on Development Sites*. Where proposed works are within the vicinity of trees, this standard is used to determine acceptable distances of works from trees via the calculation of Tree Protection Zones (TPZ) and the Structural Root Zone (SRZ).

A tree protection zone is calculated (DBH × 12) to establish the acceptable proximity of works, equipment, and construction practices/procedures from an existing tree. The proposed works must not encroach within the tree protection zone unless this encroachment is less than 10% of the TPZ, is previously agreed upon.

Structural Root Zone (SRZ) refers to the structural roots within closer vicinity to the trunk which are required by the tree to remain upright.

Note: The above is listed as a summary of the Australian Standard. The Consulting Arborist must demonstrate why relevant trees will remain viable if encroachment of more than 10% is required, or if there is any SRZ impact.

5.3.2 Tree Protection Zone procedures

This section outlines the non-negotiable prohibitions beyond allowable encroachment into the TPZ:

- Machine excavations including trenching
- Excavation for silt fencing
- Cultivation
- Storage
- Preparation of chemicals including cement products
- Parking of vehicles and plant
- Refuelling
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill
- Lighting of fires
- Soil level changes
- Temporary placement of utilities and/or signs
- Physical damage to the tree

6.0 Report exclusions

This assessment/report does not include the following:

- Below ground inspection (includes: location, condition and/or integrity of roots; condition of inaccessible parts of trunk; property or asset conflicts and/or damage due to roots).
- Soil profile test (including degrees of compaction if any).
- Detailed aerial tree inspection observations/findings (Visual Tree Inspection was conducted from the ground).
- Abiotic disorder certainty (resulting from groundwater analysis, gas leak investigations, etc).
- Certainty of resence or identity of biotic agents (pests, pathogens). Where present, biotic agents must be sampled and sent for lab analysis – a process not included in this commission.
- Certainty of decay present (if any) within the tree (tree was inspected from the outside only, meaning the condition and integrity of the structural wood within the tree cannot be ascertained).

7.0 References

Lonsdale, D., 2017. *Principles of Tree Hazard Assessment.* 7th ed. Stokehouse: UK Arb. Association.

Mattheck, C., 1996. *The Body Language Of Trees.* 7th ed. London: Stationery Office Books.

Nicolle, D., 2016. *Eucalypts For Planting In Australia.* Adelaide: Lane Print and Post.

Roberts, J., Jackson, N. & Smith, M., 2018. *Tree Roots In The Built Environment.* 3rd ed. Stokehouse: UK Arb. Association.

Standards Australia, 2007. *AS-4373-2007: Pruning of Amenity Trees,* Sydney: Standards Australia.

Standards Australia, 2009. *AS-4970-2009: Protection of Trees on Development Sites,* Sydney: Standards Australia.

8.0 Descriptors

8.1 Origin

Indigenous: Known to occur naturally at the subject site location.

Vic native: Species that occur naturally in Victoria (may include the subject site location).

Native: Species that occur naturally in other states of Australia, but not Victoria.

Exotic: species that occur naturally outside of Australia, i.e. species has been introduced.

8.2 Useful Life Expectancy (ULE)

50+ years: Trees appear to be retainable in the current landscape for more than 50 years.

- Structurally sound trees in locations that can accommodate future growth.
- Minimally-defective trees that could be made suitable for retention in the long term by remedial arboricultural practices and maintenance.
- Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

20-50 years: Trees that appear to be retainable in the current landscape for 20-50 years.

- Trees that may only live between 20 and 50 years.
- Trees that may live for more than 20 years but would be removed during the course of normal management for safety or nuisance reasons.
- Minimally-defective trees that can be made suitable for retention in the medium term by remedial arboricultural practices and maintenance.

10-20 years: Trees that appear to be retainable in the current landscape for 10-20 years.

- Trees that may only live for 10-20 years.
- Trees that may live for more than 15 years but would be removed during the course of normal management for safety or nuisance reasons.
- Defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.

0-10 years/REMOVE: Trees requiring imminent removal, or within 10 years.

- Declining trees due to disease or inhospitable conditions.
- Dangerous trees due to instability or recent loss of adjacent trees and/or structural defects including cavities, decay, included bark, wounds or poor structure.

8.3 Health ratings

Dead: Tree is completely dead or at an irreparable state of health: non-functional crown (no green leaves), stem cambium dead, no evidence of fresh shoots, heavily declined.

Poor: Tree is presenting large quantities of crown dieback or thinning. Persistent infections of pathogens, insect borers, fungal cankers and root disease may be present. Treatments may only be temporary to achieve hazard reduction prior to tree removal.

Average: Tree is presenting symptoms of stress that may be due to seasonal biotic or abiotic conditions (water stress or seasonal defoliators). Symptoms may include tip dieback, crown thinning, defoliation or leaf discoloration. Condition may be reversible.

Good: Tree is generally free of pest and disease symptoms; any biotic or abiotic stress is not present over more than 10% of the tree. Foliage cover is healthy/robust.

8.4 Structure ratings

Poor: Tree has structural weakness that may be due to poor growth development, fungal decay, mechanical damage, or a combination of these. Signs of potential structural failure of major structural components may be present.

Average: Tree has structural weaknesses, but is unlikely to fail at any major structural component and does not present symptoms of imminent failure. Minor fungal degradation may be present.

Good: Tree has no obvious, notable structural defects, or indicators of fungal decay.

8.5 Age classifications

Juvenile: Young trees, generally less than 10 years old.

Semi-mature: Trees which have reached approx. half of their expected size/lifespan.

Mature: Trees which have reached their expected size and are approximately two thirds of the way through their expected average lifespan.

Over-mature: Trees which have over-matured within the surrounding landscape and now present in a state of health and/or structural decline.

Dead: Trees with a non-functional crown or that are irreversibly dying.

Stump re-growth: Trees which have been cut to a stump and allowed to regrow.

8.6 Retention value

Low: Trees that offer little in terms of contributing to site amenity for reasons of poor health and/or structural condition or species unsuitability (invasive or environmental weed species). Juvenile and semi-mature trees which could be readily replaced may also be placed in this category. Trees of low retention value should not be a constraint on development.

Medium: Trees offering some beneficial attributes that may enhance the site or local environment, but may be limited to some degree by their health, structure or ULE. Moderate retention value trees should be considered for retention where possible within the development design, but not necessarily to the detriment of the design

High: Trees which positively contribute to the future site or local environment due to their botanical, historical or local significance in combination with good characteristics of health and structure. Significant remnant trees may be placed in this category regardless of health and structure. High retention value trees should be considered for retention and be incorporated within the design layout.

9.0 Ecological Vegetation Class large tree sizes

VRiv0803 - Victorian Riverina bioregion

EVC 803: Plains Woodland (syn. Riverina Plains Grassy Woodland) Description: An open, eucalypt woodland to 15 m tall occurring on a number of geologies and soil types. Occupies fertile clays and clay loam soils on flat or gently undulating plains at low elevations in areas with <600mm of annual rainfall. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer and chenopods are often present.

Large trees: Species DBH(cm) #/ha: Eucalyptus spp. 70 cm 15 / ha

VRiv0055 - Victorian Riverina bioregion

EVC 55_61: Plains Grassy Woodland Description: An open, eucalypt woodland to 15 m tall. Occupies well drained, fertile soils on flat or gently undulating plains at low elevations in areas with >600 mm annual rainfall. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer characterised by summer-growing grasses.

Large trees: Species DBH(cm) #/ha: Eucalyptus spp. 80 cm 10 / ha

10.0 Disclaimer

High Country Arborist Reports and its representatives are qualified professionals and we take great care to provide information that is accurate, knowledgeable, and reliable.

You hereby agree to the extent of the law that we will not be held responsible (regardless of liability theory) for occurrences or advice, due to direct, indirect or negligent actions (using professional opinions, experience, or information – including information from third parties) which lead to or are perceived to lead to: any loss or damage (monetary, or otherwise), perceived loss, perceived damage; injury; revenue changes; aesthetic changes; and/or lifestyle impacts.

We do not provide warranties or guarantees. This disclaimer is governed by the law in force in the State of Victoria, Australia.

11.0 Terms of service and advice

Prior to reading this report and subsequently following any advice, opinions or recommendations provided, you must hereby understand and agree to the following:

This assessment and subsequent report findings are the culmination of research combined with the professional opinion of a qualified consulting arborist. Our consultants pride themselves on independent reports. This report has not been produced to support a particular motive, produce a desired value, or predict a desired occurrence. All findings are reported without bias towards certain parties or results.

To the author's knowledge, all facts, assessment techniques and material presented is current and accurately researched. Opinions expressed within this report are supported by current research.

This report contains sketches, photographs, plans, and/or diagrams. These are for illustrative use only and should not be considered to scale unless stipulated otherwise.

High Country Arborist Reports and its representatives will assume that all information divulged to them regarding legal matters, ownership of property or titles is correct. Any properties or projects will be considered to be compliant to relevant codes, legislation, and/or appropriate regulations.

High Country Arborist Reports has gone to every professional length to ensure data and information provided is correct, reliable, and accurate. Data or information provided by third parties is considered outside the control of our consultants and neither they, nor *High Country Arborist Reports* will be held responsible for discrepancies or inaccuracies.

Representatives of *High Country Arborist Reports* are not required to give testimony or appear in court as a result of this tree report. An expert opinion may be presented by *High Country Arborist Reports* where further arrangements are made. However, this is not a requirement or contractual obligation of this report.

High Country Arborist Reports and its representatives will not be held responsible for occurrences outside the consultants' control.

This report is the product of a tree assessment, undertaken at the specific time and date listed on the Cover Page, within specific weather and environmental conditions. Thus, all information expressed within is relevant to this time, and date only. As a result, *High Country Arborist Reports* will be in no way held responsible for damages, matters, occurrences, or other issues occurring after this inspection was completed. Following the inspection, all aspects pertaining to the trees and sites in question are considered out of the control of *High Country Arborist Reports*.

Publication and ownership rights of this report remain with *High Country Arborist Reports*. No file sharing, hard-copy sharing, unauthorised publication or other unintended use will be undertaken without gaining prior consent from *High Country Arborist Reports*.

This report will not include or pertain to matters other than those aforementioned within the introductory letter and will not include any items listed within the 'Report Exclusions' section.

High Country Arborist Reports cannot guarantee that any opinions expressed will come to fruition, and will not be held responsible should matters discussed either eventuate or fail to do so.

TREE ID	BOTANICAL NAME	COMMON NAME	DBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT*	TREE TYPE	BIOEVC_LOT	IMPACT %	OUTCOME
709	*Eucalyptus microcarpa*	Grey Box	25	3.0	VRiv0803	SOT	ST	70	0.0	AVOIDED
710	*Eucalyptus microcarpa*	Grey Box	50	6.0	VRiv0803	SOT	CT	70	0.0	AVOIDED
711	*Eucalyptus microcarpa*	Grey Box	30	3.6	VRiv0803	SOT	CT	70	0.0	AVOIDED
712	*Eucalyptus microcarpa*	Grey Box	40	4.8	VRiv0803	SOT	CT	70	0.0	AVOIDED
713	*Eucalyptus microcarpa*	Grey Box	50	6.0	VRiv0803	SOT	CT	70	0.0	AVOIDED
714	*Eucalyptus microcarpa*	Grey Box	20	2.4	VRiv0803	SOT	CT	70	5.6	MINOR IMPACT <10%
715	*Eucalyptus microcarpa*	Grey Box	30	3.6	VRiv0803	SOT	CT	70	7.3	MINOR IMPACT <10%
716	*Eucalyptus microcarpa*	Grey Box	50	6.0	VRiv0803	SOT	CT	70	17.7	<25%
717	*Eucalyptus microcarpa*	Grey Box	40	4.8	VRiv0803	SOT	CT	70	0.0	AVOIDED
718	*Eucalyptus microcarpa*	Grey Box	30	3.6	VRiv0803	SOT	CT	70	0.0	AVOIDED
719	*Eucalyptus microcarpa*	Grey Box	30	3.6	VRiv0803	SOT	CT	70	0.0	AVOIDED
720B	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0803	SOT	ST	70	8.3	MINOR IMPACT <10%
720C	*Eucalyptus microcarpa*	Grey Box	45	5.4	VRiv0803	SOT	ST	70	0.0	AVOIDED
721	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0803	SOT	CT	70	0.0	AVOIDED
722	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0803	SOT	CT	70	0.0	AVOIDED
723	*Eucalyptus camaldulensis*	River Red Gum	5	2.0	VRiv0803	SOT	CT	70	0.0	AVOIDED
724	*Eucalyptus camaldulensis*	River Red Gum	5	2.0	VRiv0803	SOT	CT	70	0.0	AVOIDED
725	n/a Planted tree	Non-endemic								
726	*Eucalyptus microcarpa*	Grey Box	90	10.8	VRiv0803	LOT	ST	70	11.0	<25%
727	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0803	LOT	ST	70	51.6	LOST
728	*Eucalyptus microcarpa*	Grey Box	115	13.8	VRiv0803	VLOT	ST	70	32.1	LOST
729	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0803	MOT	CT	70	18.4	<25%
730	*Eucalyptus camaldulensis*	River Red Gum	90	10.8	VRiv0803	LOT	CT	70	38.1	LOST
731	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0803	LOT	CT	70	35.1	LOST
732	n/a Planted tree	Non-endemic								
733	n/a Planted tree	Non-endemic								
734	n/a Planted tree	Non-endemic								
735	n/a Planted tree	Non-endemic								
736	n/a Planted tree	Non-endemic								
737	n/a Planted tree	Non-endemic								
738	n/a Planted tree	Non-endemic								
739	n/a Planted tree	Non-endemic								
740	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0803	SOT	CT	70	0.0	AVOIDED
741	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0803	SOT	CT	70	0.0	AVOIDED
742	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0803	SOT	CT	70	16.7	<25%
743	n/a Planted tree	Non-endemic								
744	n/a Planted tree	Non-endemic								
745	n/a Planted tree	Non-endemic								
746	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0803	SOT	ST	70	0.0	AVOIDED
747	n/a Planted tree	Non-endemic								
748	n/a Planted tree	Non-endemic								
749	n/a Planted tree	Non-endemic								
750	n/a Planted tree	Non-endemic								
751	n/a Planted tree	Non-endemic								
752	n/a Planted tree	Non-endemic								
753	n/a Planted tree	Non-endemic								
754	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	ST	80	100.0	LOST
755	n/a Planted tree	Non-endemic								
756	n/a Planted tree	Non-endemic								
757	*Eucalyptus camaldulensis*	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
758	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	41.6	LOST
759	n/a Planted tree	Non-endemic								
760	n/a Planted tree	Non-endemic								

TREE ID	BOTANICAL NAME	COMMON NAME	DBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT*	TREE TYPE	BIOEVC_LOT	IMPACT %	OUTCOME
761	n/a Planted tree	Non-endemic								
762	n/a Planted tree	Non-endemic								
763	n/a Planted tree	Non-endemic								
764	*Eucalyptus camaldulensis*	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
765	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	11.1	<25%
766	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	11.8	<25%
767	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	16.7	<25%
768	*Eucalyptus camaldulensis*	River Red Gum	100	12.0	VRiv0055	LOT	CT	80	20.9	<25%
769	*Eucalyptus camaldulensis*	River Red Gum	155	15.0	VRiv0055	VLOT	CT	80	29.9	LOST
770	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	55.9	LOST
771	n/a Planted tree	Non-endemic								
772	*Eucalyptus camaldulensis*	River Red Gum	105	12.6	VRiv0055	VLOT	ST	80	37.5	LOST
773	*Eucalyptus camaldulensis*	River Red Gum	145	15.0	VRiv0055	VLOT	ST	80	27.6	LOST
774	*Eucalyptus camaldulensis*	River Red Gum	120	14.4	VRiv0055	VLOT	ST	80	24.2	<25%
775	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	ST	80	28.6	LOST
776	*Eucalyptus camaldulensis*	River Red Gum	105	12.6	VRiv0055	VLOT	ST	80	42.3	LOST
777	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	ST	80	0.0	AVOIDED
778	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	ST	80	0.0	AVOIDED
779	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	ST	80	0.0	AVOIDED
780	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	ST	80	0.0	AVOIDED
781	*Eucalyptus camaldulensis*	River Red Gum	135	15.0	VRiv0055	VLOT	CT	80	22.0	<25%
782	*Eucalyptus camaldulensis*	River Red Gum	120	14.4	VRiv0055	VLOT	CT	80	5.9	MINOR IMPACT <10%
783	*Eucalyptus camaldulensis*	River Red Gum	85	10.2	VRiv0055	LOT	CT	80	6.2	MINOR IMPACT <10%
784	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	9.5	MINOR IMPACT <10%
785	*Eucalyptus camaldulensis*	River Red Gum	75	9.0	VRiv0055	LOT	CT	80	9.9	MINOR IMPACT <10%
786	*Eucalyptus camaldulensis*	River Red Gum	90	10.8	VRiv0055	LOT	CT	80	64.1	LOST
787	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
788	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
789	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
790	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	0.0	AVOIDED
791	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
792	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
793	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
794	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
795	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
796	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
797	*Eucalyptus camaldulensis*	River Red Gum	150	15.0	VRiv0055	VLOT	CT	80	23.8	<25%
798	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
799	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
800	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	11.6	<25%
801	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	48.7	LOST
802	*Eucalyptus camaldulensis*	River Red Gum	120	14.4	VRiv0055	VLOT	CT	80	50.2	LOST
803	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	48.5	LOST
804	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	51.2	LOST
805	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	53.6	LOST
806	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	72.2	LOST
807	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	41.6	LOST
808	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	12.5	<25%
809	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	11.5	<25%
810	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
811	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	1.8	MINOR IMPACT <10%
812	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	3.7	MINOR IMPACT <10%
813	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED

TREE ID	BOTANICAL NAME	COMMON NAME	GBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT*	TREE TYPE	BIOEVC_LOT	IMPACT %	OUTCOME
814	Eucalyptus camaldulensis	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
815	Eucalyptus camaldulensis	River Red Gum	130	15.0	VRiv0055	VLOT	CT	80	20.1	<25%
816	Eucalyptus camaldulensis	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	0.0	AVOIDED
817	Eucalyptus camaldulensis	River Red Gum	135	15.0	VRiv0055	VLOT	CT	80	4.1	MINOR IMPACT <10%
818	Eucalyptus camaldulensis	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	0.0	AVOIDED
819	Eucalyptus camaldulensis	River Red Gum	220	15.0	VRiv0055	VLOT	CT	80	15.8	<25%
820	Eucalyptus camaldulensis	River Red Gum	200	15.0	VRiv0055	VLOT	CT	80	24.9	<25%
821	Eucalyptus camaldulensis	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
822	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
823	Eucalyptus camaldulensis	River Red Gum	110	13.2	VRiv0055	VLOT	CT	80	21.8	<25%
824	Eucalyptus camaldulensis	River Red Gum	135	15.0	VRiv0055	VLOT	CT	80	22.2	<25%
825	Eucalyptus camaldulensis	River Red Gum	75	9.0	VRiv0055	LOT	CT	80	22.1	<25%
826	Eucalyptus camaldulensis	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
827	Eucalyptus camaldulensis	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
828	Eucalyptus camaldulensis	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
829	Eucalyptus camaldulensis	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	14.2	<25%
830	Eucalyptus camaldulensis	River Red Gum	90	10.8	VRiv0055	LOT	CT	80	19.7	<25%
831	Eucalyptus camaldulensis	River Red Gum	95	11.4	VRiv0055	LOT	CT	80	9.9	MINOR IMPACT <10%
832	Eucalyptus camaldulensis	River Red Gum	85	10.2	VRiv0055	LOT	CT	80	5.2	MINOR IMPACT <10%
833	Eucalyptus camaldulensis	River Red Gum	75	9.0	VRiv0055	LOT	CT	80	26.5	LOST
834	Eucalyptus camaldulensis	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
835	Eucalyptus camaldulensis	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
836	Eucalyptus camaldulensis	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
837	Eucalyptus camaldulensis	River Red Gum	5	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
838	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
839	Eucalyptus camaldulensis	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
840	Eucalyptus camaldulensis	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
841	Eucalyptus camaldulensis	River Red Gum	110	13.2	VRiv0055	VLOT	CT	80	18.5	<25%
842	Eucalyptus camaldulensis	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
843	Eucalyptus camaldulensis	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
844	Eucalyptus camaldulensis	River Red Gum	105	12.6	VRiv0055	VLOT	CT	80	6.5	MINOR IMPACT <10%
845	Eucalyptus camaldulensis	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	0.0	AVOIDED
846	Eucalyptus camaldulensis	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
847	Eucalyptus camaldulensis	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
848	Eucalyptus camaldulensis	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	28.7	LOST
849	Eucalyptus camaldulensis	River Red Gum	185	15.0	VRiv0055	VLOT	CT	80	21.3	<25%
850	Eucalyptus camaldulensis	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
851	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
852	Eucalyptus camaldulensis	River Red Gum	130	15.0	VRiv0055	VLOT	CT	80	6.5	MINOR IMPACT <10%
853	Eucalyptus camaldulensis	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	58.5	LOST
854	Eucalyptus camaldulensis	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	40.0	LOST
855	Eucalyptus camaldulensis	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
856	Eucalyptus camaldulensis	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
857	Eucalyptus camaldulensis	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
858	Eucalyptus camaldulensis	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
859	Eucalyptus camaldulensis	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
860	Eucalyptus camaldulensis	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
861	Eucalyptus camaldulensis	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
862	Eucalyptus camaldulensis	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	0.0	AVOIDED
863	Eucalyptus camaldulensis	River Red Gum	130	15.0	VRiv0055	VLOT	CT	80	19.1	<25%
864	Eucalyptus camaldulensis	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
865	Eucalyptus camaldulensis	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
866	Eucalyptus camaldulensis	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED

TREE ID	BOTANICAL NAME	COMMON NAME	DBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT	TREE TYPE	BIOEVC_LOT	IMPACT %	OUTCOME
867	Eucalyptus camaldulensis	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
868	Eucalyptus camaldulensis	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	13.1	<25%
869	Eucalyptus camaldulensis	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	25.7	LOST
870	Eucalyptus camaldulensis	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	7.9	MINOR IMPACT <10%
871	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
872	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
873	Eucalyptus camaldulensis	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
874	Eucalyptus camaldulensis	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	6.2	MINOR IMPACT <10%
875	Eucalyptus camaldulensis	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	18.8	<25%
876	Eucalyptus camaldulensis	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	13.1	<25%
877	Eucalyptus camaldulensis	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	14.7	<25%
878	Eucalyptus camaldulensis	River Red Gum	85	10.2	VRiv0055	LOT	CT	80	20.9	<25%
879	Eucalyptus camaldulensis	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	3.1	MINOR IMPACT <10%
880	Eucalyptus camaldulensis	River Red Gum	90	10.8	VRiv0055	LOT	CT	80	14.8	<25%
881	Eucalyptus camaldulensis	River Red Gum	90	10.8	VRiv0055	LOT	CT	80	14.0	<25%
882	Eucalyptus camaldulensis	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
883	Eucalyptus camaldulensis	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
884	Eucalyptus camaldulensis	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
885	Eucalyptus camaldulensis	River Red Gum	100	12.0	VRiv0055	LOT	CT	80	19.1	<25%
886	Eucalyptus camaldulensis	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
887	Eucalyptus camaldulensis	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
888	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
889	Eucalyptus camaldulensis	River Red Gum	115	15.0	VRiv0055	VLOT	CT	80	22.6	<25%
890	Eucalyptus camaldulensis	River Red Gum	110	15.0	VRiv0055	VLOT	CT	80	28.0	LOST
891	Eucalyptus camaldulensis	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
892	Eucalyptus camaldulensis	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	0.0	AVOIDED
893	Eucalyptus camaldulensis	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
894	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
895	Eucalyptus camaldulensis	River Red Gum	7	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
896	Eucalyptus camaldulensis	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
897	Eucalyptus camaldulensis	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
898	Eucalyptus camaldulensis	River Red Gum	75	9.0	VRiv0055	LOT	CT	80	0.0	AVOIDED
899	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
900	Eucalyptus camaldulensis	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
901	Eucalyptus camaldulensis	River Red Gum	7	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
902	Eucalyptus camaldulensis	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
903	Eucalyptus camaldulensis	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
904	Eucalyptus camaldulensis	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
905	Eucalyptus camaldulensis	River Red Gum	135	15.0	VRiv0055	VLOT	CT	80	8.8	MINOR IMPACT <10%
906	Eucalyptus camaldulensis	River Red Gum	170	15.0	VRiv0055	VLOT	CT	80	14.7	<25%
907	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	5.6	MINOR IMPACT <10%
908	Eucalyptus camaldulensis	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	10.4	<25%
909	Eucalyptus camaldulensis	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	7.1	MINOR IMPACT <10%
910	Eucalyptus camaldulensis	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.5	MINOR IMPACT <10%
911	Eucalyptus camaldulensis	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
912	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	2.8	MINOR IMPACT <10%
913	Eucalyptus camaldulensis	River Red Gum	145	15.0	VRiv0055	VLOT	CT	80	22.0	<25%
914	Eucalyptus camaldulensis	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
915	Eucalyptus camaldulensis	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
916	Eucalyptus camaldulensis	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
917	Eucalyptus camaldulensis	River Red Gum	135	15.0	VRiv0055	VLOT	CT	80	30.6	LOST
918	Eucalyptus camaldulensis	River Red Gum	175	15.0	VRiv0055	VLOT	CT	80	40.3	LOST
919	Eucalyptus camaldulensis	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED

TREE ID	BOTANICAL NAME	COMMON NAME	DBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT*	TREE TYPE	BIOEVC_LOT	IMPACT %	OUTCOME
920	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
921	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	7.1	MINOR IMPACT <10%
922	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
923	*Eucalyptus camaldulensis*	River Red Gum	100	12.0	VRiv0055	LOT	CT	80	13.1	<25%
924	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
925	*Eucalyptus camaldulensis*	River Red Gum	95	11.4	VRiv0055	LOT	CT	80	17.0	<25%
926	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
927	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
928	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	1.0	MINOR IMPACT <10%
929	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
930	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
931	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
932	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	29.0	LOST
933	*Eucalyptus camaldulensis*	River Red Gum	7	2.0	VRiv0055	SOT	CT	80	46.2	LOST
934	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	17.6	<25%
935	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	5.6	MINOR IMPACT <10%
936	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
937	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
938	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
939	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
940	*Eucalyptus camaldulensis*	River Red Gum	90	10.8	VRiv0055	LOT	CT	80	13.2	<25%
941	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
942	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
943	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
944	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
945	*Eucalyptus camaldulensis*	River Red Gum	90	10.8	VRiv0055	LOT	CT	80	24.9	<25%
946	*Eucalyptus camaldulensis*	River Red Gum	85	10.2	VRiv0055	LOT	CT	80	5.5	MINOR IMPACT <10%
947	*Eucalyptus camaldulensis*	River Red Gum	150	15.0	VRiv0055	VLOT	CT	80	30.9	LOST
948	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	2.2	MINOR IMPACT <10%
949	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
950	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
951	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
952	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
953	*Eucalyptus camaldulensis*	River Red Gum	95	11.4	VRiv0055	LOT	CT	80	4.7	MINOR IMPACT <10%
954	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
955	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
956	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
957	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
958	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	6.6	MINOR IMPACT <10%
959	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
960	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
961	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
962	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
963	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
964	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
965	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
966	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
967	*Eucalyptus camaldulensis*	River Red Gum	135	15.0	VRiv0055	VLOT	CT	80	12.4	<25%
968	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
969	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
970	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
971	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
972	*Eucalyptus camaldulensis*	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED

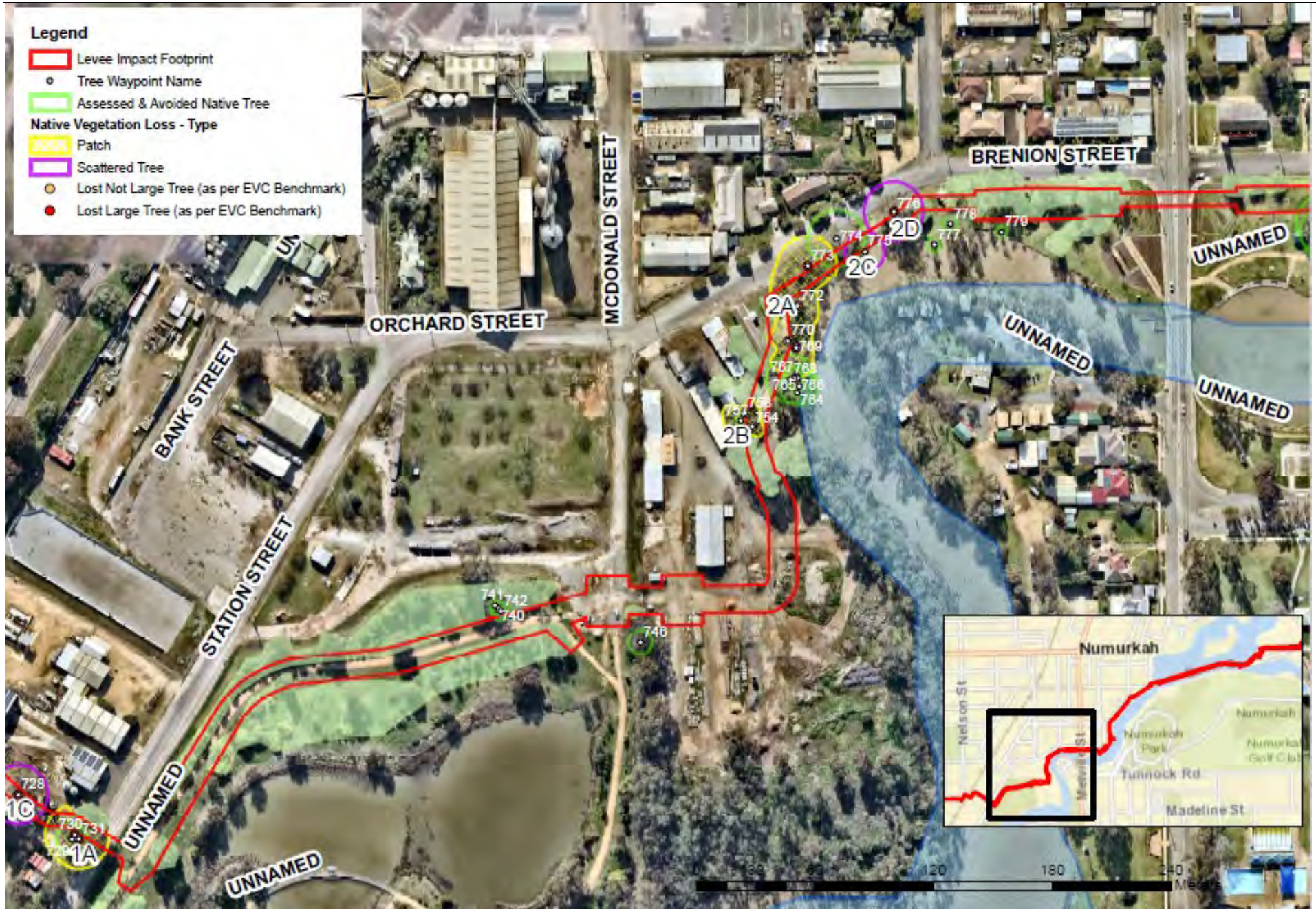
TREE ID	BOTANICAL NAME	COMMON NAME	DBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT*	TREE TYPE	BIOEVC_LOT	IMPACT %	OUTCOME
973	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
974	*Eucalyptus camaldulensis*	River Red Gum	6	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
975	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
976	*Eucalyptus camaldulensis*	River Red Gum	75	9.0	VRiv0055	LOT	CT	80	15.8	<25%
977	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	3.6	MINOR IMPACT <10%
978	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	6.8	MINOR IMPACT <10%
979	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	15.8	<25%
980	*Eucalyptus camaldulensis*	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
981	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
982	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
983	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
984	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
985	*Eucalyptus camaldulensis*	River Red Gum	130	15.0	VRiv0055	VLOT	CT	80	32.9	LOST
986	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	6.6	MINOR IMPACT <10%
987	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	16.0	<25%
988	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	14.2	<25%
989	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	3.7	MINOR IMPACT <10%
990	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	4.4	MINOR IMPACT <10%
991	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	1.4	MINOR IMPACT <10%
992	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	7.3	MINOR IMPACT <10%
993	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	14.6	<25%
994	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	5.6	MINOR IMPACT <10%
995	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	11.1	<25%
996	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	32.1	LOST
997	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
998	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	20.6	<25%
999	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1000	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	0.7	MINOR IMPACT <10%
1001	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	58.4	LOST
1002	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1003	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
1004	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1005	*Eucalyptus camaldulensis*	River Red Gum	75	9.0	VRiv0055	LOT	CT	80	0.4	MINOR IMPACT <10%
1006	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1007	*Eucalyptus camaldulensis*	River Red Gum	120	14.4	VRiv0055	VLOT	CT	80	22.7	<25%
1008	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1009	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	0.0	AVOIDED
1010	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1011	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1012	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1013	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1014	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	0.0	AVOIDED
1015	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1016	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1017	*Eucalyptus camaldulensis*	River Red Gum	140	15.0	VRiv0055	VLOT	CT	80	28.9	LOST
1018	*Eucalyptus camaldulensis*	River Red Gum	120	14.4	VRiv0055	VLOT	CT	80	16.0	<25%
1019	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	1.9	MINOR IMPACT <10%
1020	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	11.8	<25%
1021	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	3.7	MINOR IMPACT <10%
1022	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
1023	*Eucalyptus camaldulensis*	River Red Gum	105	12.6	VRiv0055	VLOT	CT	80	42.7	LOST
1024	*Eucalyptus camaldulensis*	River Red Gum	110	13.2	VRiv0055	VLOT	CT	80	40.2	LOST
1025	*Eucalyptus camaldulensis*	River Red Gum	95	11.4	VRiv0055	LOT	CT	80	55.7	LOST

TREE ID	BOTANICAL NAME	COMMON NAME	DBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT*	TREE TYPE	BIOEVC_LOT	IMPACT %	OUTCOME
1026	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	52.7	LOST
1027	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	67.0	LOST
1028	*Eucalyptus camaldulensis*	River Red Gum	120	14.4	VRiv0055	VLOT	CT	80	56.2	LOST
1029	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1030	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1031	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1032	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1033	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1034	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1036	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1037	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1038	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1039	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
1040	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1041	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1042	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1043	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1044	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1045	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1046	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1047	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1048	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
1049	*Eucalyptus camaldulensis*	River Red Gum	100	12.0	VRiv0055	LOT	CT	80	0.0	AVOIDED
1050	*Eucalyptus camaldulensis*	River Red Gum	120	14.4	VRiv0055	VLOT	CT	80	6.6	MINOR IMPACT <10%
1051	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1052	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1053	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1054	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	6.3	MINOR IMPACT <10%
1055	*Eucalyptus camaldulensis*	River Red Gum	135	15.0	VRiv0055	VLOT	CT	80	20.2	<25%
1056	*Eucalyptus camaldulensis*	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1057	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	100.0	LOST
1058	*Eucalyptus camaldulensis*	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1059	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1060	*Eucalyptus camaldulensis*	River Red Gum	7	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1061	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1062	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1063	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	44.4	LOST
1064	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	42.9	LOST
1065	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	34.6	LOST
1066	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	19.4	<25%
1067	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1068	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1069	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	9.7	MINOR IMPACT <10%
1070	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	0.0	AVOIDED
1071	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1072	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1073	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1074	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1075	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1076	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1077	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1078	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1079	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED

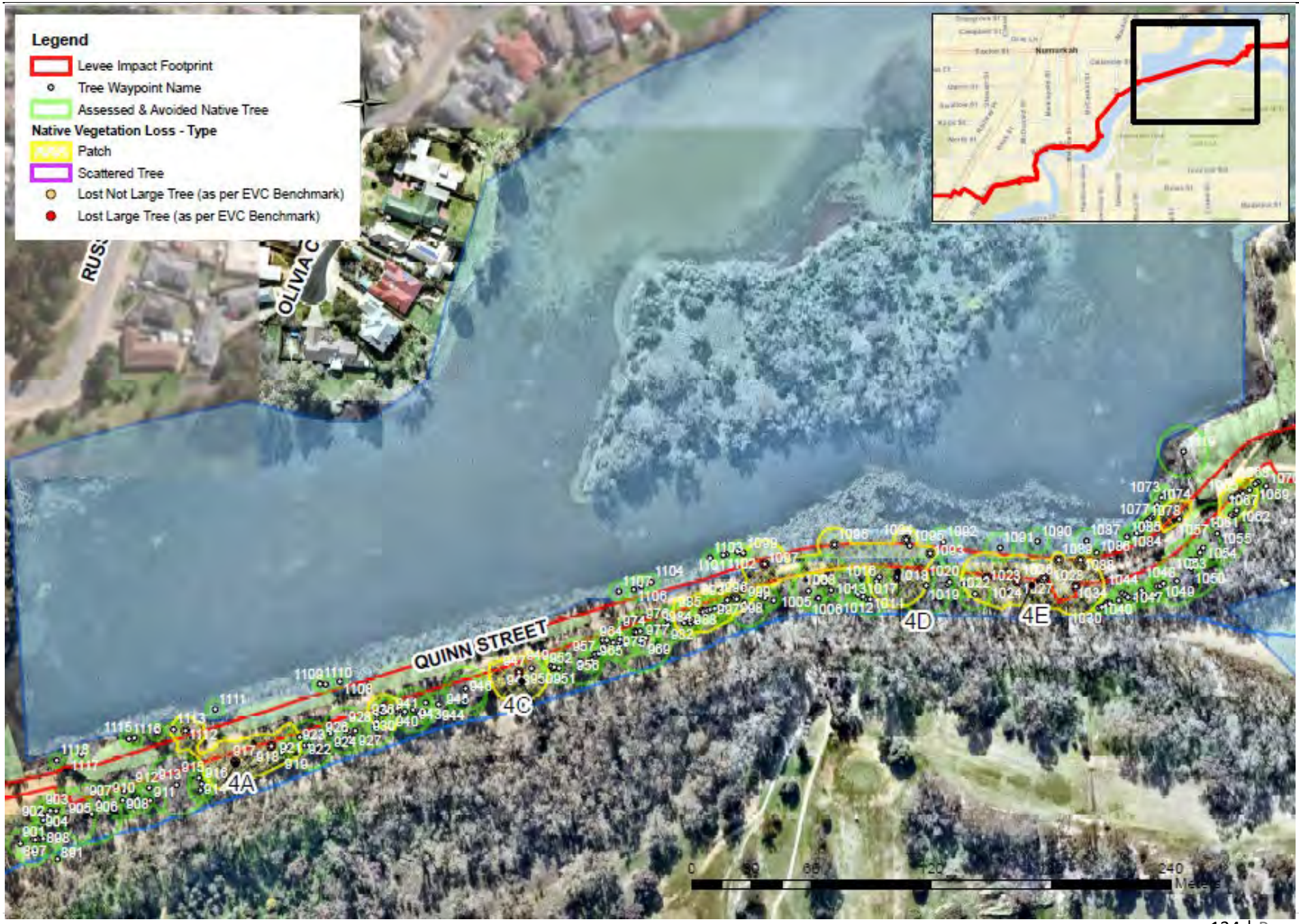
TREE ID	BOTANICAL NAME	COMMON NAME	DBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT*	TREE TYPE	BIOEVC_LOT	IMPACT %	OUTCOME
1080	*Eucalyptus camaldulensis*	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1081	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1082	*Eucalyptus camaldulensis*	River Red Gum	7	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1083	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	3.3	MINOR IMPACT <10%
1084	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1085	*Eucalyptus camaldulensis*	River Red Gum	10	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1086	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1087	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1088	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	CT	80	66.7	LOST
1089	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	65.9	LOST
1090	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1091	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	22.8	<25%
1092	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	24.1	<25%
1093	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	CT	80	53.6	LOST
1094	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	28.3	LOST
1095	*Eucalyptus camaldulensis*	River Red Gum	15	2.0	VRiv0055	SOT	CT	80	69.2	LOST
1096	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	47.5	LOST
1097	*Eucalyptus camaldulensis*	River Red Gum	95	11.4	VRiv0055	LOT	CT	80	59.9	LOST
1098	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1099	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1100	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1101	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1102	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1103	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1104	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1105	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	1.1	MINOR IMPACT <10%
1106	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	8.0	MINOR IMPACT <10%
1107	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1108	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1109	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1110	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1111	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1112	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	27.8	LOST
1113	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1114	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1115	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1116	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1117	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1118	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1119	*Eucalyptus camaldulensis*	River Red Gum	105	12.6	VRiv0055	VLOT	CT	80	0.0	AVOIDED
1120	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	ST	80	0.0	AVOIDED
1121	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	ST	80	0.0	AVOIDED
1122	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	ST	80	0.0	AVOIDED
1123	*Eucalyptus camaldulensis*	River Red Gum	85	10.2	VRiv0055	LOT	CT	80	0.0	AVOIDED
1124	*Eucalyptus camaldulensis*	River Red Gum	75	9.0	VRiv0055	LOT	CT	80	0.0	AVOIDED
1125	*Eucalyptus camaldulensis*	River Red Gum	90	10.8	VRiv0055	LOT	CT	80	0.0	AVOIDED
1126	*Eucalyptus camaldulensis*	River Red Gum	20	2.4	VRiv0055	SOT	ST	80	83.3	LOST
1127	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	ST	80	100.0	LOST
1128	*Eucalyptus camaldulensis*	River Red Gum	25	3.0	VRiv0055	SOT	ST	80	85.7	LOST
1129	*Eucalyptus camaldulensis*	River Red Gum	95	11.4	VRiv0055	LOT	CT	80	0.0	AVOIDED
1130	*Eucalyptus camaldulensis*	River Red Gum	95	11.4	VRiv0055	LOT	CT	80	0.0	AVOIDED
1131	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1132	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	3.8	MINOR IMPACT <10%

TREE ID	BOTANICAL NAME	COMMON NAME	DBH (cm)	TPZ (m radius)	BIO EVC	TREE SIZE CAT*	TREE TYPE	BIOEVC_LDT	IMPACT %	OUTCOME
1133	*Eucalyptus camaldulensis*	River Red Gum	70	8.4	VRiv0055	LOT	CT	80	0.0	AVOIDED
1134	*Eucalyptus camaldulensis*	River Red Gum	80	9.6	VRiv0055	LOT	CT	80	0.0	AVOIDED
1135	*Eucalyptus camaldulensis*	River Red Gum	95	11.4	VRiv0055	LOT	CT	80	5.4	MINOR IMPACT <10%
1136	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1137	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1138	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	5.3	MINOR IMPACT <10%
1139	*Eucalyptus camaldulensis*	River Red Gum	35	4.2	VRiv0055	SOT	CT	80	0.0	AVOIDED
1140	*Eucalyptus microcarpa*	Grey Box	75	9.0	VRiv0055	LOT	ST	80	32.4	LOST
1141	*Eucalyptus microcarpa*	Grey Box	15	2.0	VRiv0055	SOT	ST	80	100.0	LOST
1142	*Eucalyptus microcarpa*	Grey Box	15	2.0	VRiv0055	SOT	ST	80	100.0	LOST
1143	*Eucalyptus microcarpa*	Grey Box	25	3.0	VRiv0055	SOT	CT	80	100.0	LOST
1144	*Eucalyptus microcarpa*	Grey Box	25	3.0	VRiv0055	SOT	CT	80	28.6	LOST
1145	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	3.2	MINOR IMPACT <10%
1146	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	0.6	MINOR IMPACT <10%
1147	*Eucalyptus camaldulensis*	River Red Gum	115	13.8	VRiv0055	VLOT	CT	80	19.3	<25%
1148	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	7.4	MINOR IMPACT <10%
1149	*Eucalyptus camaldulensis*	River Red Gum	85	10.2	VRiv0055	LOT	CT	80	1.8	MINOR IMPACT <10%
1150	*Eucalyptus camaldulensis*	River Red Gum	90	10.8	VRiv0055	LOT	CT	80	0.0	AVOIDED
1151	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	ST	80	16.9	<25%
1152	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
1153	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
1154	*Eucalyptus camaldulensis*	River Red Gum	105	12.6	VRiv0055	VLOT	CT	80	0.0	AVOIDED
1155	*Eucalyptus camaldulensis*	River Red Gum	110	13.2	VRiv0055	VLOT	CT	80	0.7	AVOIDED
1156	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
1157	*Eucalyptus camaldulensis*	River Red Gum	65	7.8	VRiv0055	MOT	CT	80	0.0	AVOIDED
1158	*Eucalyptus camaldulensis*	River Red Gum	50	6.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1159	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
1160	*Eucalyptus camaldulensis*	River Red Gum	100	12.0	VRiv0055	LOT	CT	80	0.0	AVOIDED
1161	*Eucalyptus camaldulensis*	River Red Gum	210	15.0	VRiv0055	VLOT	CT	80	0.0	AVOIDED
1162	*Eucalyptus camaldulensis*	River Red Gum	40	4.8	VRiv0055	SOT	CT	80	0.0	AVOIDED
1163	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1164	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1165	*Eucalyptus camaldulensis*	River Red Gum	55	6.6	VRiv0055	MOT	CT	80	0.0	AVOIDED
1166	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
1167	*Eucalyptus camaldulensis*	River Red Gum	5	2.0	VRiv0055	SOT	CT	80	0.0	AVOIDED
1168	*Eucalyptus camaldulensis*	River Red Gum	60	7.2	VRiv0055	MOT	CT	80	0.0	AVOIDED
1169	*Eucalyptus camaldulensis*	River Red Gum	45	5.4	VRiv0055	SOT	CT	80	0.0	AVOIDED
1170	*Eucalyptus camaldulensis*	River Red Gum	30	3.6	VRiv0055	SOT	CT	80	0.0	AVOIDED
	SOT = Small Tree <75% of LT Benchmark size									
	MOT = Medium Tree >75% to 99% of LT Benchmark size									
	LOT = Large Tree 100% to 150% of LT Benchmark size									
	VLOT = Very Large Tree >150% of LT Benchmark size									

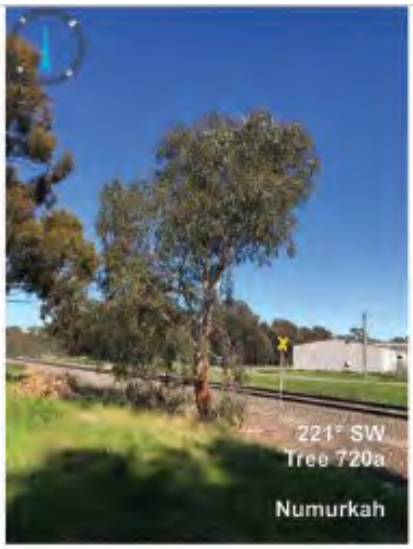
Legend
Levee Impact Footprint
Tree Waypoint Name
Assessed & Avoided Native Tree
Native Vegetation Loss - Type
Patch
Scattered Tree
Lost Not Large Tree (as per EVC Benchmark)
Lost Large Tree (as per EVC Benchmark)
N
NELSON STREET
NEEDHAM STREET
STATION STREET
UNNAMED
1A
1B
1C
Numurkah
Tunnock Rd
Madeline St
0 20 40 80 120 160 Meters


Legend
Levee Impact Footprint
Tree Waypoint Name
Assessed & Avoided Native Tree
Native Vegetation Loss - Type
Patch
Scattered Tree
Lost Not Large Tree (as per EVC Benchmark)
Lost Large Tree (as per EVC Benchmark)
BRENION STREET
MCDONALD STREET
ORCHARD STREET
BANK STREET
STATION STREET
UNNAMED
UNNAMED
UNNAMED
UNNAMED
UNNAMED
2A
2B
2C
2D
1A
1C
Numurkah
Nelson St
Melville St
Numurkah Park
Numurkah Golf Club
Tunnock Rd
Madeline St
0
60
120
180
240
Metres


Legend
Levee Impact Footprint
Tree Waypoint Name
Assessed & Avoided Native Tree
Native Vegetation Loss - Type
Patch
Scattered Tree
Lost Not Large Tree (as per EVC Benchmark)
Lost Large Tree (as per EVC Benchmark)
QUINN STREET
MCCASKILL STREET
MELVILLE ST
UNNAMED
KNOX STREET
GRAY STREET
BRENION STREET
UNNAMED
UNNAMED
3A
3B
3C
3D
3E
3G
Numurkah
Nelson St
Tunnock Rd
Madeline St
0
30
60
120
180
240
Meters


Legend
Levee Impact Footprint
Tree Waypoint Name
Assessed & Avoided Native Tree
Native Vegetation Loss - Type
Patch
Scattered Tree
Lost Not Large Tree (as per EVC Benchmark)
Lost Large Tree (as per EVC Benchmark)
Numurkah
QUINN STREET
OLIVIA C
4A
4C
4D
4E
0
60
120
240
Metres


Legend
Levee Impact Footprint
Tree Waypoint Name
Assessed & Avoided Native Tree
Native Vegetation Loss - Type
Patch
Scattered Tree
Lost Not Large Tree (as per EVC Benchmark)
Lost Large Tree (as per EVC Benchmark)
KINNAIRDS ROAD
QUINN STREET
CREEK ROAD
5A
5B
Numurkah
0 30 60 120 180 240
Meters


221° SW
Tree 720a
Numurkah

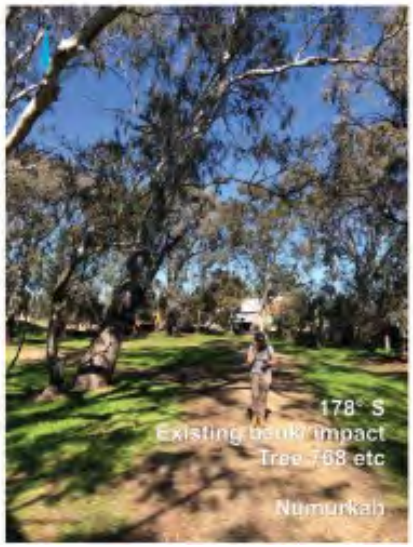

186° S
Tree 720b
Numurkah


193° S
Start levee back
across road from Tree 731
Numurkah

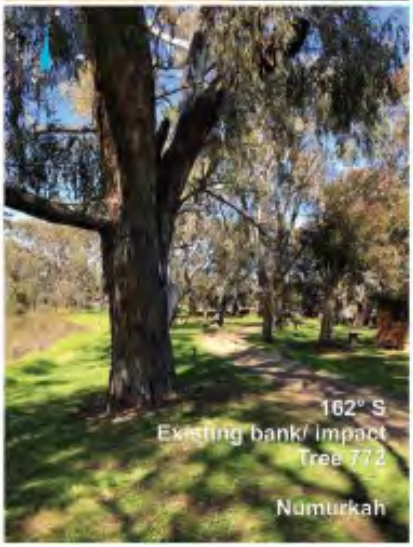

230° SW
Built up carpark area for levee
Numurkah


211° SW
Built up carpark area for levee
Numurkah


19° N
Existing bank/ impact
Tree 768 etc
Numurkah


178° S
Existing bank/ impact
Tree 768 etc
Numurkah


119° SE
Existing bank/ impact
Tree 772
Numurkah


162° S
Existing bank/ impact
Tree 772
Numurkah


59° NE
Existing bank/ impact
Tree 774 775
Numurkah


72° E
Existing bank/ impact
Tree 774 775
Numurkah


73° E
Existing impact
Tree 776
Numurkah

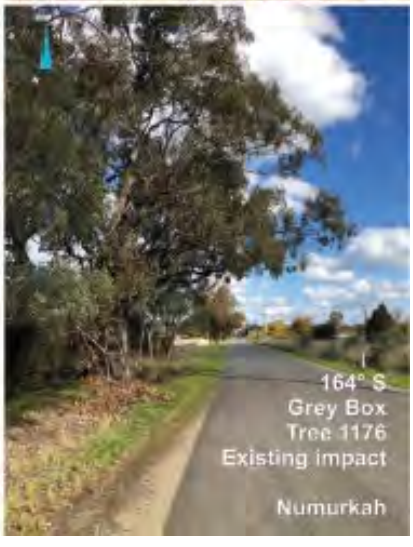

126° SE
Tree 781
Numurkah


51° NE
Tree 820 etc
Existing impact from road.
Walk in this area
Numurkah


50° NE
Tree 820 etc
Existing impact from road.
Walk in this area
Numurkah


90° E
Tree 889/890
Examples of trees 'lost' but retained in place
Numurkah


172° S
Land built up
No levee
Numurkah


164° S
Grey Box
Tree 1176
Existing impact
Numurkah