

Expert Witness - Ecology

# Ecology Expert Witness Statement

Submission to the West Gate Tunnel Project Inquiry and Advisory  
Committee - Planning Panels Victoria



# In the matter of the West Gate Tunnel Project

## Inquiry and Advisory Committee

Proponent: Western Distributor Authority

### Expert Witness Statement By

Cameron Miller (B.Sc. (Biol), M.Sc. (Ecology and Management), Graduate Certificate  
in Arboriculture (in progress))

AECOM Australia Pty Ltd. Project No. 60338862

By

A handwritten signature in blue ink, appearing to read 'Cameron Miller', is written over a light blue grid background.

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Cameron Miller  
02 August 2017

## 1.0 Name and address

Name: Cameron J Miller  
Address: Collins Square, Level 10, Tower Two,  
727 Collins Street, Melbourne, VIC 3008

## 2.0 Introduction

My firm (AECOM Australia Pty Ltd [AECOM]) prepared the technical report titled West Gate Tunnel Project Environmental Impact Assessment: Ecology Assessment which is included as Technical Report F to the Environment Effects Statement (EES) for the West Gate Tunnel Project (the project).

The role that I had in preparing the Technical Report was to oversee the assessment and documentation of the existing ecological conditions and the impact assessment of the project. This included the completion of:

- desktop data extraction and analysis;
- field assessments;
- analysis and reporting;
- determination of impact pathways; and
- a risk assessment.

### 2.1 Persons assisting with this task

A number of staff assisted with this project including:

- Christopher White;
- Jonathan Billington; and
- Mallory Barnes.

Their qualifications are summarised below.

#### Christopher White

- a. Christopher holds a Bachelor of Environmental Science degree (1<sup>st</sup> Class Honours) from Monash University 2007. He is currently completing a PhD assessing the impact of human disturbance and climatic variation on vegetation succession within the western plains of Victoria. Chris is a member of the Ecological Society of Australia, the Environment Institute of Australia and New Zealand and the Wildlife Society.
- b. Chris is DELWP habitat hectares accredited (2009-2016) and an accredited tree climber with aerial rescue.
- c. Chris has been a consultant ecologist for over 12 years and a senior project manager for the past five. He has extensive experience in the design and implementation of ecological survey throughout Australia's temperate and semi-arid zone environments. Chris has provided specialist ecological advice for a range of major projects including both the Hume Highway Tarcutta Bypass and the Hume Highway duplication project in southern New South Wales, the expansion of Melbourne's Urban Growth Boundary on behalf of the Growth Areas Authority, Melbourne Water's Waterways Alliance, and the Geelong Saltworks Urban Renewal Project. His involvement in key infrastructure and development projects in NSW and Victoria demanded an in-depth understanding of the application of both state and national biodiversity policy, and refined skills in stakeholder engagement and client management.

- d. Complementing Chris' ecological impact assessment experience is his expertise and training in the application of Geographic Information Systems to ecological theory and practice.

Jonathan Billington

- a. Jonathan holds a Bachelor of Science degree with majors in zoology and genetics, gained from Monash University 2007.
- b. Jonathan is an ecologist with over eight years consulting experience, working across multiple disciplines for a wide range of clients.

Jonathan has experience in a wide range of ecological investigations including desktop studies, due diligence assessments, general and targeted flora and fauna assessments and aquatic surveys. Jonathan has been involved in the preparation of a wide variety of reports including construction management, ecological improvement and offset management plans. As part of his role with AECOM Jonathan has led negotiations with DELWP's Bush Broker, landholders and clients to obtain suitable offset sites for developments within and beyond Melbourne's growth boundary. Jonathan also has an integral role in organising and conducting field based investigations.

During his past eight years working at AECOM Jonathan has worked together with a wide variety of clients to assess the potential ecological impacts of projects. Client experience includes Department of Defence, Department of Transport, VicRoads, VicTrack, The Victorian Desalination Plant, local government and a range of residential property developers.

Mallory Barnes

- a. Mallory holds a Bachelor of Law and Bachelor of Science degree with majors in plant science and ecology, gained from the Australian National University in 2013. He received first class honours in Science (Conservation Biology) from the University of Western Australia in 2014.
- b. Mallory is an environmental scientist with two years of consulting experience, working across multiple disciplines for a number of clients across Australia.

Mallory has undertaken a wide range of ecological investigations such as desktop studies, general flora and fauna surveys, ecological management plans and impact assessment for large infrastructure projects. In the course of this work, he has been involved in the preparation of reports including standard operating procedures, offset management plans and impact assessments. In doing so, Mallory has worked for clients such as Transurban, AusNet, the Department of Defence, Melbourne Water and the Level Crossing Removal Authority. He has also undertaken site based roles where he worked as an environmental manager on the Brunswick Terminal Station, a large electrical infrastructure upgrade, in which he was responsible for ensuring operational compliance against a Construction and Environmental Management Plan. More recently, Mallory has been involved in the provision of planning, monitoring and scientific advice relating to the restoration of disturbed mine lands. Mallory has played a key role in organising and conducting field investigations. In the course of this work, Mallory has worked for clients such as the Queensland Department of Environment and Heritage Protection, Peabody Energy Australia, Glencore Coal Assets Australia, Origin Energy and Stanwell.

I adopt the Technical Report, in combination with this document, as my written expert evidence for the purposes of the West Gate Tunnel Project Inquiry and Advisory Committee's review of the EES, draft planning scheme amendment and works approval application.

### 3.0 Qualifications and experience

- a. I hold the degree of Bachelor of Science (University of Melbourne) and Masters of Science - Ecology and Management (University of Adelaide) and am currently completing a graduate Certificate in Arboriculture (University of Melbourne).
- b. For the past 18 years I have been employed as an ecologist in the capacity as a consultant or working for government agencies such as Parks Victoria and the Environment Protection Authority (Victoria). In my current role I act as the National Practice Leader, Natural Resources. I also have a technical role and have expertise in:
  - Flora and fauna surveys
  - Fauna habitat mapping and assessment
  - Environmental impact assessment
  - Habitat hectare analysis
  - Ecological planning advice, State and Federal referrals
  - Experimental design and analysis.
- c. My qualifications and experience are detailed in Annexure A.
- d. A copy of my curriculum vitae is provided in Annexure B

### 4.0 Further work since preparation of the Technical Report

Since the Technical Report was finalised, I have undertaken an additional visual inspections of:

1. Moonee Ponds Creek, and
2. Kororoit Creek.

The purpose of his assessment was to examine how existing vegetation responds to bridges and overhead structures. This further work has not caused me to materially change my opinions expressed in the Technical Report.

## 5.0 Abbreviations and glossary

The following abbreviations and terms are used throughout this statement.

Abbreviation	Definition
BIOR	Biodiversity Impact and Offset Report
DBH	Diameter at breast height
DoEE	Department of Environment and Energy
DELWP	Department of Environment, Land, Water and Planning
DEPI	Department of Environment and Primary Industries (now DELWP)
EEA	<i>Environmental Effects Act 1978</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPR	Environmental Performance Requirement
EVC	Ecological Vegetation Class
FFG Act	<i>Flora and Fauna Guarantee Act 1988</i>
FIS	Flora Information System
GDE	Groundwater Dependent Ecosystem
Hha	Habitat hectares
HZ	Habitat zone
MLTV tree	Medium – Long Term Viability tree
NMLTV tree	Non Medium – Long Term Viability tree
NVIM	Native Vegetation Information Management
PMST	Protected Matters Search Tool
VROTS	Victorian rare or threatened species
VBA	The Victorian Biodiversity Atlas

## 6.0 Scope

### 6.1 Instructions

I have been requested by Clayton Utz on behalf of the Western Distributor Authority to prepare an expert report and appear at the Panel hearing of this matter for the purpose of presenting my expert opinion concerning flora and fauna matters associated with the project.

In addition, I was requested to:

1. Review the public submissions and identify those relevant to my area of expertise.
2. Review my previous report and identify whether any changes to the conclusions of the report are necessary arising out of the issues raised by the public submissions or as a consequence of any other relevant matter.
3. Prepare an expert report that:
  - a. Responds to the public submissions relevant to my area of expertise;
  - b. addresses my previous report and any changes to the conclusions reached; and
  - c. any other matter that I consider relevant to my area of expertise.
4. I have also been asked to prepare a short (20 minute) power point presentation and to attend the hearing to give evidence in relation to my report.
5. In addition, on 21/07/2017 Clayton Utz requested that I respond to the '*West Gate Tunnel Project Preliminary Matters and Further Information Request*' issued by the Inquiry and Advisory Committee

### 6.2 Process and Methodology

Full details on the process and methods used in the ecology assessment are presented in Technical Report F.

## 7.0 Findings

### 7.1 Commonwealth referral

On 14 January 2016 it was decided the project was a “not controlled action” in response to the EPBC Act Referral (2015/7620) submitted in December 2015 to the Australian Department of Environment (now the Department of Environment and Energy). Therefore no Commonwealth approvals are required for the project.

The species and communities listed under EPBC Act were nonetheless considered within the impact assessment, particularly where they are also listed under state legislation. A number of EPBC Act-listed species have at least a low likelihood of occurrence and several are likely to visit the project area on an intermittent basis. Consistent with the referral, significant impacts to these species are not considered likely to occur.

### 7.2 Summary of Impacts

The following section provides a summary of impacts associated with the project.

#### 7.2.1 Remnant and Planted Vegetation

Table 1 present a summary of losses to both remnant vegetation and planted vegetation by project component.

Table 1. Summary of vegetation losses by component.

Category	Value		Component			Total
			West Gate Freeway	Tunnels	Port, CityLink and city connections	
Planted vegetation	MLTV Trees	Direct impact	2224	102	624	2950
		Shade impact	1	1	2	4
	NMLTV Trees	Direct impact	256	13	116	385
		Shade impact	1	5	2	8
		<b>Sub Total (planted trees)</b>	<b>2482</b>	<b>121</b>	<b>744</b>	<b>3347</b>
Native Vegetation	EVC140: Mangrove Shrubland (Least concern)	Area	0.002	-	-	0.002
		Habitat hectares	0.001	-	-	0.001
	EVC641: Riparian Woodland (Endangered)	Area	0.047	-	-	0.047
		Habitat hectares	0.011	-	-	0.011
	EVC9: Coastal Saltmarsh (Least concern)	Area	0.473	-	-	0.473
		Habitat hectares	0.208	-	-	0.208
	EVC656: Brackish Wetland (Endangered)	Area	-	-	0.141	0.141
		Habitat hectares	-	-	0.05	0.05
	Scattered Trees (ST)	Individuals	22	-	-	22
		<b>Sub Total (Area)</b>	<b>0.52</b>	<b>-</b>	<b>0.14</b>	<b>0.66</b>
	<b>Sub Total (Hha)</b>	<b>0.22</b>	<b>-</b>	<b>0.05</b>	<b>0.27</b>	
	<b>Sub Total (ST)</b>	<b>22</b>	<b>-</b>	<b>-</b>	<b>22</b>	

MLTV- Medium Long Term Viability, NMLTV – Non Medium Long Term Viability

## 7.2.2 Fauna

The modification of land within the project boundary has had a marked impact on available fauna habitat. Historically, it would have once supported grasslands, woodlands, wetlands and a number of natural watercourses and coastal environs.

The project boundary now supports limited natural habitat and where this does occur, it is typically degraded. Planted vegetation is recognised to provide foraging and limited shelter habitat for microbats, arboreal mammals such as possums, birds and skinks. However, a noticeable lack of hollows is considered to reduce the suitability of the project area to provide nesting by microbats, parrots, arboreal mammals and owls.

No critical habitat was considered present within the field investigation extent for threatened fauna. Foraging and temporary roosting habitat for Grey-headed Flying-fox *Pteropus poliocephalus*, Swift Parrot *Lathamus discolor* and Powerful Owl *Ninox strenua* was present, in the form of flowering eucalypts. The loss of this habitat however, was not considered likely to significantly impact these species. Further information in this determination for each species is provided below:

**Swift Parrot:** Swift Parrots are naturally distributed from Tasmania to Southern Queensland. They breed in Tasmania in late spring-summer and occur as non-breeding migrants to mainland south-eastern Australia from autumn to early spring. They generally prefer Box-Ironbark forests and woodlands inland of the Great Dividing Range; sometimes also other forests and woodlands in coastal and sub-coastal areas. Whilst they are recognised to occur within Melbourne, no sites within the West Gate Project Area are recognised as important survey sites for Swift Parrot by Birdlife Australia (refer to Table 2). The closest site is the Newport Lakes Reserve, south of Blackshaws Road. Given this information and the recognition that more substantial habitat and feed sources occur across the wider Melbourne area, consistent with the EPBC Act referral, impacts to Swift Parrot are not considered significant.

**Table 2. Target locations for Swift Parrot survey August 2017 (source Birdlife Australia: Woodland Birds & Threatened Bird Network Team).**

Greater Melbourne	
East	Bunyip State Park
Inner	Royal Park, Parkville
Inner	Yarra Bend Park and Golf Course
Inner	Abbotsford/Clifton Hill - close to Yarra
North	Brunswick - parkland and streets
North	Northcote - parkland and streets
North	Sunbury, surrounding streets
North-east	Bundoora - golf course and parkland
North-east	Macleod/Rosanna - train station and parkland
North-east	Eltham - sections of Yarra, streets
North-east	Warrandyte, Bend of Islands - sections of Yarra
North-east	Plenty/South Morang - streets, river
North-east	Yan Yean Reservoir (Arthurs Creek Rd section), Whittlesea (Cades Rd)
North-east	Greensborough/Plenty - parkland and streets
North-east	Templestowe - streets and parks
North-east	Heidelberg West (Malahang Park)
South	Boyd Park, Murrumbeena

Greater Melbourne	
South	Urban Forest Reserve, Malvern East
South	Edithvale-Seafood Wetlands - Seaford, Carrum Downs
South	Beaumaris - parkland and streets
South-east	East Bentleigh - parkland and streets
South-east	Mt Waverley - parkland and streets
South-east	Jells Park
South-east	Clayton (Monash University Clayton Campus)
South-east	Blackburn, Box Hill North - parks, sections of Gardiners Creek, Koonung Trail
South-east	Chirnside Park -streets and parks
North-west	Woodlands Historic Park (and nearby streets), areas in Keilor
West	Altona/Altona North - parkland and streets
West	Newport Lakes Reserve (and nearby streets)
West	Broadmeadows - parkland and streets

Grey-headed Flying Fox: Grey-headed Flying foxes are naturally distributed from Queensland to South Australia and are rarely observed more than 200km inland. Roost sites commonly occur in gullies, in vegetation with dense canopy cover and close to water. They have been known to travel 50-60 km from camps to forage but generally will commute distances <20 km. They feed on the nectar and pollen of native trees, in particular Eucalyptus, Corymbia, Angophora, Melaleuca and Banksia, and fruits of rainforest trees and vines. The National Flying-fox Monitoring Viewer (DoE, 2017) maps camps of the Grey-headed Flying-fox; none are shown to exist within the field investigation extent. The presence of flowering Eucalypt and Corymbia species within the field investigation extent may provide a temporary food source for the Grey-headed Flying-fox, however, significantly more resources exist outside the project area which will provide food resources for this species during and post construction. Consistent with the EPBC Act referral, significant impacts to this species are not considered likely.

Powerful Owl: Large trees, particularly Eucalypts, Corymbia and large old Elms may provide foraging and temporary roosting habitat for Powerful Owl. Powerful Owl is a large raptor that preys on possums, gliders and other bird species. In recent years the species has been recorded more frequently hunting in Melbourne city and parklands and reserves in greater Melbourne. Due to the proximity of suitable habitat, it is possible that Powerful Owl could utilise the field investigation extent on occasion for hunting and feeding. However, the potential for use by Powerful Owl is limited and is likely to be restricted to more isolated areas such as quiet parks and reserves that contain suitable large trees. Given this and the lack of impact within such areas, significant impacts to Powerful Owl are not considered likely.

The likelihood of threatened species occurrence has been assessed for the project. Those species that are considered to have a moderate or higher likelihood of occurrence are presented in Table 3. As presented in Table 3 a number of FFG listed birds that utilise estuarine and freshwater environs also have the potential to occur within the project area. Species include the Caspian Tern *Hydroprogne caspia* (FFG listed) which was observed feeding within the Stony Creek Backwash and again within the Moonee ponds Creek. Similarly the FFG and EPBC Act (Marine) listed Eastern Great Egret *Ardea modesta* has also been observed within Moonee Ponds Creek. The FFG Act contains a number of management processes within regards to threatened species management including: developing Action Statements, Management Plans and determining 'critical habitat'. No critical habitat has been described for either species nor any other species identified in Table 3. An Action Statement (120) has been prepared for the Egrets which acknowledges threats include the 'loss and fragmentation of feeding and breeding habitat and the alteration of flows'. However, this loss is referring to large

areas of natural waterways throughout Victoria in areas such as Gunbower and Barmah Forests, Ramsar sites and swamps and deep water marshes such as Wallenjoe, Doctors, Black and Dowdle Swamps. At no point in Action Statement 120 are any of the waterways that occur within the project area mentioned nor are they considered significant for these species. restricted to more isolated areas such as quiet parks and reserves that contain suitable large trees. Given this significant impacts to FFG Act birds are not considered likely.

With regards to advisory listed species that are neither EPBC Act nor FFG Act listed, there is no legal protection for these species or a requirement to determine the level of impact.

**Table 3. Species considered to have a moderate or greater likelihood of occurrence within project components.**

Common name	Scientific name	EPBC	FFG	VROT	Records	Most recent record	Preferred habitat	West Gate Freeway	Tunnels	Port, CityLink & city connections
<b>Birds</b>										
Australasian Shoveler	<i>Anas rhynchos</i>			v	51	2013	Inhabits various wetlands, preferring large, well-vegetated freshwater swamps and wetlands. Also estuaries, coastal inlets and artificial waterbodies (e.g. dams, sewage ponds).	Moderate	Unlikely	Unlikely
Caspian Tern	<i>Hydroprogne caspia</i>		L	nt	18	2008	Coastal, sub-coastal and inland saltwater, brackish and fresh waterbodies and waterways, beaches, lakes and sheltered estuaries. Occasionally reservoirs and artificial wetlands.	Present	Low	Present
Common Greenshank	<i>Tringa nebularia</i>	Mig		v	115	2008	Margins of inland wetlands and sheltered coastal habitats, including swamps, lakes, rivers, creeks, billabongs, waterholes, embayments, estuaries, mudflats, saltmarsh, mangroves and sewage ponds; mainly spring-summer non-breeding migrant.	Moderate	Unlikely	Low
Common Sandpiper	<i>Actitis hypoleucos</i>			v	26	2012	Edges of saltwater to fresh waterbodies and wetlands, including estuaries, lakes, drainage lines, tidal watercourses and mudflats; occasionally beaches and rocky headlands; mainly spring-summer non-breeding migrant.	Moderate	Low	Moderate
Eastern Great Egret	<i>Ardea modesta</i>	Ma	L	v	146	2010	Freshwater and brackish wetlands and watercourses, intertidal mudflats, inland lakes, swamps and rivers; also farm dams, irrigation	High	Low	Present

Common name	Scientific name	EPBC	FFG	VROT	Records	Most recent record	Preferred habitat	West Gate Freeway	Tunnels	Port, CityLink & city connections
							drainages and artificial wetlands.			
Fairy Tern	<i>Sternula nereis nereis</i>	VU	L	e	6	1990	Coastal estuaries, bays and inlets, saltwater and brackish lakes; also coastal salt-fields and sewage ponds.	Moderate	Unlikely	Unlikely
Gull-billed Tern	<i>Gelochelidon nilotica macrotarsa</i>		L	e	2	2008	Coastal and inland wetlands and waterbodies, including estuaries, brackish and freshwater lakes, beaches, swamps and sometimes grasslands and ploughed lands.	Moderate	Unlikely	Unlikely
Lewin's Rail	<i>Lewinia pectoralis pectoralis</i>		L	v	33	2008	Well vegetated wetlands and waterbodies, particularly swampy woodlands and wet heathlands, estuaries, saltmarshes, sedgeland, reedbeds and densely vegetated swamps.	Moderate	Unlikely	Moderate
Little Egret	<i>Egretta garzetta nigripes</i>		L	e	87	2003	Tidal mudflats, brackish and saltwater wetlands, including saltmarshes, estuaries, littoral habitat and mangroves; less often freshwater wetlands and occasionally sewage ponds.	Moderate	Low	Moderate
Powerful Owl	<i>Ninox strenua</i>		L	v	34	2010	Foothill and coastal forests where they favour gullies with Peppermint and Manna Gum forests; some dispersal to lowland areas, including parks and gardens with large trees in autumn-winter.	Moderate	Moderate	Moderate
Swift Parrot	<i>Lathamus discolor</i>	CR / Ma Ma	L	e	17	2008	Breeds in Tasmania, late spring-summer; occurs as non-breeding migrant to mainland south-eastern Australia mainly autumn-early spring. Generally prefers Box-Ironbark forests and	Moderate	Moderate	Moderate

Common name	Scientific name	EPBC	FFG	VROT	Records	Most recent record	Preferred habitat	West Gate Freeway	Tunnels	Port, CityLink & city connections
							woodlands inland of the Great Dividing Range; sometimes also other forests and woodlands in coastal and sub-coastal areas.			
<b>Mammals</b>										
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	VU	L	v	893	2006	Roost sites commonly occur in gullies, in vegetation with dense canopy cover and close to water. Rarely more than 200km inland.	Moderate	Moderate	Moderate

### 7.2.3 Aquatic ecology

Aquatic habitat quality was variable across the project alignment. The lower reach of Kororoit Creek has had a history of industrial disturbance and poor water quality. However, recent rehabilitation works in proximity to the Westgate Freeway has seen an increase in in-stream and riparian vegetation (Melbourne Water, 2013).

The lower reaches of Stony Creek represent a largely natural estuary with marine influences and a predominance of coastal saltmarsh and mangroves.

The Maribyrnong River is the largest waterway assessed within the field investigation extent and was observed to be channelised with rock battering on the embankments and planted amenity trees. Similarly, much of Moonee Ponds Creek is a heavily disturbed, deeply incised, man-made channel lined with concrete. However, more natural components of the creek do occur between Footscray Road and Dynon Road which contained areas of brackish wetland and in-stream macrophytes and aquatic vegetation.

The general poor quality of the waterways within the project footprint was considered to limit the potential to support any significant fauna species. Whilst it is acknowledged that these waterways may on occasion be inhabited by threatened fish, the likelihood of occurrence is considered low or unlikely. If present, it is likely that significant fish species utilise these waterway only as a means to migrate between the upper and lower reaches of the waterways. With appropriate construction management it is considered that their value as a corridor would not be impacted by the project during either construction or operation.

All waterways would support common species including River Blackfish *Gadopsis marmoratus*, Common Galaxias *Galaxias maculatus*, Short-finned eels *Anguilla australis* as well as exotic species such as Carp *Cyprinus carpio* and Mosquito Fish *Gambusia affinis*. In the more estuarine areas species such as Black Bream *Acanthopagrus butcheri*, Mulloway *Argyrosomus japonicus* and Yellow-eye Mullet *Aldrichetta forsteri* are likely to occur. The waterways were not considered important for amphibians and again are likely to support population of common amphibians such as the Common Froglet *Crinia signifera*, Striped Marsh Frog *Limnodynastes peronii* and Southern Brown Tree Frog *Litoria ewingii*.

### 7.3 Offsetting the loss of remnant vegetation and threatened species habitat

The offsetting of the removal of native vegetation in Victoria is governed by the '*Permitted clearing of native vegetation - Biodiversity Assessment Guidelines*' (the biodiversity assessment guidelines) produced by the Department of Primary Industries, Victoria (now DELWP).

AECOM completed a 'testing clearing proposal' using the EnSym<sup>1</sup> tool to review removals in line with biodiversity assessment guidelines. The complete EnSym analysis is presented in Technical Report F with the offset requirements summarised below:

- The general offset amount (general biodiversity equivalence units) is 0.141 general units.
- It is in the vicinity of Port Phillip and Westernport Catchment Management Authority (CMA) or cities of Hobsons Bay, Maribyrnong, Melbourne and Wyndham.
- The strategic biodiversity score of all marked native vegetation is 0.126.
- It has a minimum strategic biodiversity score of 0.101.
- The project has no specific offset requirements.

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<sup>1</sup> A site assessment tool that estimates the impact of actions on the landscape administered by the Department of Environment, Land, Water and Planning.

## Interpretation

Given that no specific offsets have been determined the DEWLP model considers that the removal of native vegetation is not deemed to have a significant impact on habitat for any rare or threatened species.

## 7.4 Opportunity to address impacts to planted vegetation

Within the context of the West Gate Tunnel Project and the EES scoping requirements, aspects of urban ecology (both planted and remnant vegetation) have been considered. From an ecological perspective, planted vegetation within the urban context is recognised to provide habitat for a range of native fauna species as well as other benefits such as ecosystem services, for example, urban cooling and carbon sequestration. In addition, planted vegetation is recognised to provide social benefit and urban amenity.

### 7.4.1 Opportunities to mitigate impacts

In total approximately 917,500 plants are proposed to be planted, including in excess of 17,500 trees. The proposed breakdown of trees to be planted is provided by component in Table 4.

Table 4. Tree planting proposals by project component.

Project component	Trees to be planted		Total No. of trees
	Indicative advanced trees	Indicative tube-stock	
Westgate Freeway	2350	12550	14900
Tunnels	690	700	1390
Port, CityLink and City Connections	960	250	1210
<b>Totals</b>	<b>4000</b>	<b>13500</b>	<b>17500</b>

New, additional parklands and open space are also proposed. The overall species composition of the landscape package for the project is based on a diverse selection of local and endemic plants. Five major groups of plant species would be used in the plantings: street trees to match existing trees (for example *Eucalyptus tricarpa* or *Corymbia maculata*), exotic tree species, riparian species (for example *Melaleuca ericifolia*, *Eucalyptus camaldulensis*, *Casuarina cunninghamiana* and *Acacia retinodes*), native species for the street and parkland (for example *Corymbia maculata*, *Eucalyptus cinerea*, *Eucalyptus leucoxylon*, *Eucalyptus tricarpa*, *Eucalyptus cladocalyx* and *Acacia melanoxylon*) and small trees and large shrubs known as batter and screen planting (for example *Banksia marginata*, *Acacia pycnantha*, *Callistemon salignus*, *leptospermum lanigerum*, *leptospermum continentale* and *Melaleuca lanceolata*).

Overall, the species selection is consistent with promoting ecological values of the area, however, in some low-lying areas subject to salt inundation, the species palette may need to be amended to better suit these areas. Further information on specific mitigation measures by project component are provided below.

### 7.4.2 West Gate Freeway

Opportunities exist to provide suitable planted vegetation at the West Gate Freeway edge, which would serve to provide an important visual buffer between the freeway and the industrial and residential land uses, as well as providing connected vegetation and fauna habitat. Within the M80 Ring Road corridor a mix of large and small native and indigenous trees would be planted in combination with tube-stock and hydroseed grasses. All canopy vegetation along the West Gate Freeway component that is damaged (either planned or accidentally) by works would be reinstated. The following landscape treatments are proposed:

- Additional planting of Kororoit Creek, north and south of the Princes Freeway (M1) associated with the upgrade of the shared user path. These plantings are consistent with the Kororoit Creek Regional Strategy (Land Design Partnership, 2006) as they utilise

riparian species indigenous to the area. Final planting palettes should be confirmed within the final Landscape Plan to ensure consistency with the vision of Greening the West and the Kororoit Creek Regional Strategy (LDP, 2006) and to provide ground-storey, mid-storey and canopy vegetation.

- The space at the northern end of the New Street Quarry (South Kingsville) would be opened up and undergo extensive native planting to create a 3 hectare local park. This would involve an upgrade of the northern section of the quarry site with constructed mounds of native grasses, native groundcovers and a mix of large native and indigenous trees. A playground space is also planned for the patch of scattered River Red Gums adjacent the New Street and the Newport Rail line.
- Stony Creek is proposed to be upgraded with extensive indigenous riparian revegetation planting. Native grasses would be used in combination with a mix of large and small native indigenous trees, thereby improving habitat. An integrated series of bioswales would be incorporated along both sides of the creek to treat roadway water before entry into the creek. It is proposed that this would enhance riparian habitat by improving water quality. Closer to the confluence between Stony Creek and the Yarra River, there would be revegetation with a mix of wetland species. An additional area of land (1.7 hectares) would be added to this reserve south of Stony Creek (Woods Street Reserve) to enlarge and improve the Stony Creek Reserve.

#### **7.4.3 Tunnel**

Opportunities exist to 'make-good' with plantings within the local region to offset the impacts of amenity planting removals for construction of the tunnel portals. The following landscape treatments are proposed:

- The design intends to construct a four hectare wetland at the northern portal to the tunnel. This wetland would be bordered by Whitehall Street and involve wetland and riparian planting. The northern fringe of this planting would include mixed native grass species, native ground cover and native and indigenous trees. The southern boundary would include mounded rock banding revegetated with native grasses, ground covers and sedges. The western end would include native grasses and street trees that match the existing streetscape. This entire planting would be fringed by large native trees and matching street trees. Palm Trees *Phoenix spp.* would be planted in the adjacent Yarraville Gardens. Man-made wetlands are common in Melbourne and are recognised to provide a number of services such as improved local amenity, provision of aquatic and riparian habitat, and ecosystem services such as pollutant and stormwater retardation and production of oxygen etc.
- Additional plantings of various ground-flora and trees on both the eastern and western edge of the Maribyrnong to improve canopy cover.

Plantings are designed to improve the overall net cover of vegetation and to provide a mixed plant palette both in terms of species and structure. The creation of an artificial wetland will create additional habitat for wetland and woodland birds, frogs and other native fauna.

#### **7.4.4 Port, CityLink and city connections**

Within the port, CityLink and city connections component the following landscape treatments are proposed:

- The design proposes to revegetate the eastern bank of the Maribyrnong with mixed native grasses, bands of native groundcover and large native /indigenous trees south of Shepherds Bridge. This would provide some improved north-south habitat connectivity along the eastern bank of the Maribyrnong River.
- Further plantings are proposed within the Port Phillip Monument Park at Shepherds Bridge which includes ground covers, planting bands, large native or indigenous trees and large feature indigenous trees

- The creation of a series of bio-retention swales and treatment ponds along Footscray Road with the aim of turning a disused service road into connective habitat corridor between Moonee Ponds Creek and the Maribyrnong River. The design places the viaduct along Footscray Road in the centre of the road, enabling the retention of a greater number of existing trees to and allowing for additional canopy planting.
- Some additional canopy will be created in 'in-fill' areas north of Footscray Road between Appleton Dock Road and CityLink.
- The creation of new open space (1.4 hectares) is proposed for an area of unused rail land north of Footscray Road and west of Moonee Ponds Creek, West Melbourne. This would involve the rehabilitation of land to expand the riparian habitat and for Water Sensitive Urban Design (WSUD). This area is 'subject to stakeholder approval' and could be further developed to better meet the City of Melbourne Urban Forest Strategy (CoM, 2016) and improve canopy cover.
- Additional plantings are proposed on the western bank of Monee Ponds Creek in proximity to E-Gate to improve north-south connection and canopy cover.
- A small area of wetland planting is also proposed between Dynon Road and E-Gate.

Planted vegetation in this component is designed to improve the overall net cover of vegetation over time and to provide a mixed plant palette (both in terms of species and structure) within the urban environment.

## 7.5 Key assumptions and limitations

The findings of this report are subject to the following assumptions and limitations:

- AECOM is not responsible for the accuracy of third party data.
- Targeted threatened species survey was undertaken for amphibians, in particular the Growling Grass Frog.
- It was not possible to access all roadside areas due to safety issues. In these circumstances, surveyors attempted to view vegetation from other accessible areas such as vegetation and wetland areas at the western end of the site. Triple on/off ramps were viewed from the vehicle and through the fence at Altona Memorial Park and from the vehicle behind noise walls along sections of the West Gate Freeway
- AECOM cannot guarantee the accuracy of information assumed to be within some busy road sections where it was unsafe to stop or slow-down. It is considered unlikely that these areas contain any additional values of ecological significance given the disturbance history within the project alignment.
- The shade model presented in Technical Report F was built using the best available information on the design at the time of writing the report. Where possible, detailed information was used in the model. Where this was not possible the model diverted back to the reference design. In addition, the model is limited by the accuracy of spatial and topographic data available.
- Field-based quantification of planted vegetation was only completed by AECOM for a section of Footscray Road, between Dudley Street and the Maribyrnong River, with Donald McLean Reserve, around New Street South Kingsville and associated with the Footscray Hockey Centre. Other planted tree data was provided to AECOM by the City of Melbourne or Landscape Department. Quantification of losses is based on the combined data set.
- For the purposes of this impact assessment, it is assumed that all vegetation (planted and indigenous) would be lost where it falls within the construction area for the project, including all vegetation:
  - From within the West Gate Freeway corridor from the Western Ring Road interchange to the southern portal

- Directly beneath the Hyde Street off ramps
- Within the sites proposed for tunnel portals
- Beneath the overpass of Footscray Road
- Directly beneath the elevated structures of the port, CityLink and city connections components.

This determination has been made as vegetation would be subject to direct impact (loss) from construction, soil compaction and potential root damage, reduced incidence of rain and as such availability of water and increased shading.

- Mapping of GDEs does not provide an indication of the level of groundwater dependence of a potential GDE. DELWP acknowledges further analysis and field based data collection is required to further inform GDE mapping. No such further investigation works have been completed as part of this assessment.

## 7.6 Response to Key Submissions

The following section presents a response to key submissions by broad themes.

### 7.6.1 Adequacy of proposed open space on Mooney Ponds Creek (submissions 17, 203, 303, 326)

A number of submissions questions the value of proposed new open space, particularly that proposed along Moonee Ponds Creek. It is my determination that these areas can and will provide some habitat, particularly for fauna that utilise existing remnant vegetation, scattered trees and planted vegetation. The proposed planting palettes contain a mixture of indigenous and native species, including grasses and ground-covers, small shrubs and trees and larger trees. In addition, some of the street trees will match the existing trees and include exotic species. As such, given the increase in area of reservation and number of proposed trees (planting in a 3:1 ratio) it is my determination that there will be an overall gain in urban habitat availability over time.

Further consideration of the landscaping, surface levels and grade at the interface of the proposed new open space on the west bank of Moonee Ponds Creek and Moonee Ponds Creek could also be made to encourage recolonisation of the area by remnant vegetation including brackish wetland that will be impacted by the project.

### 7.6.2 Impacts of structures, bridges and piers on waterways (submissions 93, 184, 303, 344)

The submissions discuss the proposition that the Maribyrnong River bridges impact on the ecological value of the river. Furthermore, one submission questions why 'no effort has been made to consider the projects ability to improve ecological condition of Moonee Ponds Creek'.

Technical Report F presents the findings of both desktop and field based assessments and includes reference the Melbourne Water's determinations regarding the value of the waterways. These are presented in Technical Report F Appendix B, Tables 25-35. For each of the waterways Melbourne Water has rated the current conditions of values such as fish, frogs, birds, vegetation and macroinvertebrates based on long-term data. Whilst it is not the intent to summarise the data for each waterway, as a generalisation for the majority of values the resultant current ratings are 'low', 'poor' or 'very poor'. Whilst it is acknowledged that exceptions exist (particularly for frogs and amenity) generally these waterways are not considered pristine and have been heavily impacted by over 100 years of human modification.

With regards to Moonee Ponds Creek and the adequacy of the assessment of the impacts of structures on the 'biological function' of the waterways, it should be recognised that currently nine structures exist over the waterway of Moonee Ponds Creek between (and including) Footscray Road and CityLink. The proposed new structures are not considered to provide wholesale changes to the existing environment, however, it is recognised these structures impact one of the few 'natural' reaches of the Creek. Under existing conditions the land does provide habitat for a range of generally common flora and fauna and more broadly ecosystem

services. The technical report (Technical Report F) acknowledges that there will be some loss of habitat within Moonee Ponds Creek but that this is not significant, particularly given the highly modified landscape within which it exists.

In terms of presenting 'improvements' it was not within my scope to discuss potential improvements to waterways or potential future condition. However, Technical Report F does present information on opportunities to mitigate impacts for each project component and does discuss the measures to improve the terrestrial environment, particularly around Kororoit, Stony and Moonee Ponds Creeks. The creation of the new reserve on Moonee Ponds Creek could be designed to provide an equal or greater area of in-stream and riparian habitat in very close proximity to the loss.

#### **7.6.3 Impacts to aquatic native fauna and water quality (submissions 17, 161, 184, 206, 278, 303, 337, 344, 345, 354, 368, 441, 495)**

Several submissions raised the matter that works in waterways have the potential to impact water quality and disturbance to riverbed sediments. Furthermore, some consider the existing EPR (EP5) does not provide enough controls in terms of spatial and temporal scales. In response to this, consideration should be given to redrafting EP5 to better reflect a requirement to protect riverbed habitats and the spatial and temporal scales over which impacts are considered acceptable.

There is concern that the proposed structures within Moonee Ponds Creek and the Maribyrnong will not allow the passage of fish. Passage of fish was considered within the impact assessment and the potential for piers to impact on interact with fish movement. SW7 Surface Water Management during construction (SW7) states that: '*The CEMP must include surface water management requirements and methods for Maintenance of existing flow paths, drainage lines and floodplain storage*'. Given this it has been determined that the project will maintain flow within waterways during construction and operation and as such fish migration and movement will be unrestricted.

Several submitters were concerned about the loss of aquatic habitat. The project acknowledges that there will be some loss of aquatic habitat, particularly in the form of riparian vegetation associated with Kororoit, Stony and Moonee Ponds Creeks. In addition, the piers in waterways will result in some reduction in aquatic habitat and impacts to the riverbed. This loss is small (refer to Table 1) and will be offset in line with government policy. No offsets currently exist for loss of aquatic habitat other than that which is considered remnant vegetation. Opportunities to improve the habitat of these waterways are presented in Section 7.4 and within Technical Report F. In addition, submission 495 presents a further opportunity to 'naturalise' areas of Stony Creek that are channelised in concrete. These sections run north of the Westgate Freeway, west of the West Gate Golf course. I concur that this would provide additional ecological benefit and would improve waterway health and ecological connection.

#### **7.6.4 Removal of planted trees, loss of canopy cover and adequacy of offsets (submissions 123, 133, 158, 184, 203, 206, 326, 337, 338, 340, 346, 351, 368, 378, 407, 419, 442, 454)**

Some submissions raise inconsistencies in the EES documents and the technical reports, for example 'Section 6 itemises the loss of 2721 trees whereas the Technical Report (page 125) indicates there were only 2,502 that will be damaged or removed'. Though I am unable to locate the reference to 2,502 trees, there may be inconsistencies depending on the value referred to (eg MLTV, NMLTV, planted vegetation) and the project component. As such I have provided a complete summary of losses in Section 7.1 which is consistent with Technical Report F. This indicates that total losses predicted are 3347 planted trees of varying age and useful life expectancy. It should be noted that this is considered 'worst case scenario' as there are further opportunities through detailed design and the implementation of EPRs to further minimise tree losses as described below.

EP1: Minimise vegetation removal and disturbance (EP1) and EP2: Vegetation protection measures (EP2) provide a number of performance requirements to further minimise impacts and protect retained trees. In addition, an arboricultural assessment is proposed to maximise tree retention and the long-term viability of amenity plantings. A Tree Management Plan is

proposed to be developed that meets the Australian Standard 4970-2009 Protection of Trees on Development Sites which will provide an opportunity to manage individual trees that may be partially impacted by construction and operation.

The assessment provided a comprehensive assessment of all planted vegetation and captured all the relevant data to feed into the City of Melbourne's tree evaluation method. The impact assessment presents a worst case scenario and acknowledges that there are still opportunities to further reduce impacts. The mitigation of impacts associated with the loss of planted trees has been achieved through the development of a '*Landscaping Plan that includes replacement of affected planted vegetation to achieve a canopy of equal (or greater) size of healthy, mature examples of the species. The plan must ensure the reinstatement of soils is of sufficient quality and volumes to support the long-term viability of replacement plantings. The plan must achieve a minimum tree replacement ratio of 3:1*'.

It is proposed that the Landscaping Plan be developed in consultation '*with the relevant council with regard to local policies and strategies*' which provides a further opportunity for councils to make comment on the Landscaping Plan.

Submission 378 acknowledges the proposed mitigation is to plant at a 3:1 ratio that will result in at a minimum no net loss in canopy of planted trees. However, this submission also acknowledges that it will take many years for the canopy to establish and mature trees to form. A number of other submissions (eg 184, 338, 340) do not consider the proposed planting acceptable from a canopy cover perspective and consider the number of replacement planting of trees from tube-stock insufficient. Given that 13,500 replacement trees are proposed to be planted as tube-stock the time to maturity is significant. One way to address these submissions is to increase the quantum of advanced trees up from 22%. This will lead to a reduction in time for a significant canopy to form in the medium term (10-20 years) from which point seedlings and advanced trees will demonstrate similar growth and form. Alternatively, where possible early works could include advanced planting in areas not-impacted by construction.

With regards to Greening the West, this Strategy has a target to maximise urban greening through doubling the tree canopy cover by 2050 and increasing green spaces by 2030. The Strategy acknowledges there are a number of ways to achieve urban greening including street trees and verge planting, green roofs and vertical gardens, public and private gardens and various reserves and sporting fields. The Strategy also recognises that in excess of 29,000 trees and 82,000 plants have been planted by council from 2008.

Whilst it is recognised the project will have an impact on tree canopy over a 10-20 year period due to the loss of 3347 trees (maximum), the project is also proposing to offset the loss of trees in a 3:1 ratio that includes 4000 advanced trees, a further 13500 tube-stock and 917,500 additional plants. In addition, a number of new parks and reserves will be created that increase public open space by 8.9 hectares. Whilst this will provide a significant natural asset, alternative opportunities have been suggested that may provide greater long-term benefit and better align with existing strategies. These include:

- The Dynon Road Tidal Canal shared path, rehabilitation and bird sanctuary;
- Rehabilitation to the Dynon Road Wildlife Reserve
- Lower Stony Creek naturalisation
- Moonee Ponds Creek linear Park, and
- Greening the Pipeline, and
- The City of Melbourne North and West Melbourne Urban Forest Precinct Plan 2014-2024.

Projects such as these may also allow for advanced planting to occur prior to, or concurrent with removals and thus speed up the establishment of canopy cover. If this was to occur it may be able to reduce the time on which the canopy is replaced by four to five years and therefore reduce the time until ecological benefit.

I consider it would be appropriate to further refine the proposed landscape treatments having regard to these strategies.

#### **7.6.5 Adequacy of survey effort and impacts on terrestrial native fauna (submissions 17, 203, 303, 311, 326, 341, 356, 368)**

I have reviewed the above-mentioned submissions and provide the following response. Several submissions questioned the level of fauna survey effort and put forward a requirement to survey every tree for fauna.

In my opinion the level of effort was sufficient as we relied heavily on the VBA data which contained 927 records of threatened fauna and the EPBC Act online Protected Matters Search Tool. In addition we utilised other reports provided to AECOM by the City of Melbourne which contained additional fauna (bird) surveys. Some of the conclusions in the report regarding the presence or likely presence of fauna within the alignment also considered other sources of information such as Melbourne Water (2007) and Melbourne Water (2013). Given this, the survey effort was considered sufficient to broadly characterise the existing environment. It was not proposed or considered necessary to sample every tree or parcel of habitat to document all species presence, rather, our aim was to characterise the environment from the most sensitive receptors such as threatened fauna.

It is recognised that the VBA data has some limitations as not all observations made are input into the VBA. For example the last Swift Parrot record is 2008 whereas it is widely recognised that Swift Parrot occur within Melbourne annually over the winter months. However, the report regularly referred to '*The presence of flowering Eucalypt and Corymbia species may provide a temporary food source for the Grey-headed Flying-fox and Swift Parrot and hunting habitat for Powerful Owl. As such, these species are considered to have a moderate potential to utilise the vegetation that exists within the field investigation extent*'. Given this, these species were considered within the risk and impact assessment and appropriate mitigation measures developed to minimise impacts and loss.

A number of submissions requested fauna surveys and management prior to, or during clearing. It is my opinion that EP4: Fauna management measures (EP4) covers any concerns these submitters have.

There are some general concerns about the loss of one of the more pristine and 'quieter' patches of Moonee Ponds Creek in relation to new overhead structures and impacts on fauna habitat.

It is acknowledged that two new structures will be built over Moonee Ponds Creek and that these will result in the loss of 0.14 hectares (0.05 Hha) of EVC 656: Brackish Wetland and a number of planted trees. This does impact the amenity of the space, however, as these structures predominantly run east-west there is limited loss of light (reduced shading) and the physical footprint is relatively minor compared to existing CityLink structure to the north of Dynon Road. Losses of remnant vegetation will be offset which considers loss of fauna habitat and as such the structures will not significantly impact on any threatened fauna.

#### **7.6.6 Impacts on Stony Creek and reserves (submissions 158, 161, 398, 434, 439, 441, 442, 472, 478, 495)**

A number of submissions identified a potential conflict between the proposed Landscape Plan for the Stony Creek Reserve and mounding and planting that may impact on coastal saltmarsh EVC and stands of mangroves. I have reviewed these submissions and concur that the existing Landscape Plan is not consistent with the Stony Creek master plan. It is acknowledged that a significant amount of work has progressed by the Friends of Stony Creek and the Maribyrnong City Council to improve the overall ecological condition and amenity of Stony Creek. This was identified in my technical report where I recommended a review of the species palette and area of planting within of my technical report (Section 6.2, Technical Report F). However, based on the submissions I have proposed some changes to the wording to better articulate the issues with the existing Landscape Plan:

Stony Creek is proposed to be upgraded with extensive indigenous riparian revegetation planting. Native grasses would be used in combination with a mix of large and small native indigenous trees, thereby improving habitat. An integrated series of bioswales would be incorporated along both sides of the creek to treat roadway water before entry

into the creek. It is proposed that this would enhance riparian habitat by improving water quality. Closer to the confluence between Stony Creek and the Yarra River, there would be revegetation with a mix of wetland species. **While it is recognised there are significant opportunities to improve the existing vegetation within the Reserve, in particular within weedy sections of the reserve and on the southern side of Stony Creek, there is also the potential that the proposed Landscape Plan impacts on remnant coastal saltmarsh. This should be avoided and impacts minimised. In addition, it is proposed to revegetate with a number of native grasses. It is our opinion that some of the species proposed are not likely to be successful over low-lying areas with significant salt inundation. These areas are contain sands and muds and are dominated by coastal saltmarsh or mangroves.** As such it is AECOM's determination that the landscape plan and its list of proposed species would have to be modified in consultation with the Hobsons Bay City Council, **Maribyrnong City Council, Melbourne Water** and the Friends of Stony Creek to ensure successful replacement planting'.

The statement better reflects the existing conditions (both weedy areas and high-value areas) and the requirement to minimise impacts on remnant vegetation. In addition, it provides greater clarity that in my opinion some of the proposed landscape species are not likely to be successful and should be reconsidered. Furthermore, the statement now also recognises that Maribyrnong City Council abuts Stony Creek and therefore should also be consulted on the matter.

#### **7.6.7 Impacts associated with groundwater drawdown (submissions 158, 434, 442)**

The submission considers that the protection measures for Yarraville Gardens are generally inadequate and that and CEMP could be strengthened to document the monitoring, management and contingency measures if impacts are determined.

A number of EPR's deal with planted vegetation and the potential impacts associated with groundwater drawdown, including GW3: Tunnel drainage design and construction methods, EP1 and EP2.

These EPRs have been developed to provide contingency measures and controls to ensure the maintenance of the base groundwater flows to Stony Creek and terrestrial ecosystems and to limit acidification. Furthermore, EP1 and EP2 provide an opportunity for pre, during and post construction monitoring to establish baseline conditions and to develop appropriate contingency measures and offsets should vegetation be impacted.

#### **7.6.8 Removal, loss and degradation of native vegetation (including through shading) (submissions 17, 106, 147, 158, 161, 167, 203, 326, 337, 356, 368, 378, 422, 441, 442)**

I have reviewed the submissions and believe they generally relate to the loss of native vegetation including:

- Loss of open space along 'Railway Canal' and the loss of remnant vegetation through bank widening and overhead structures
- Potential impacts of the loss of coastal saltmarsh and 'downstream' impacts causing further loss or degradation to the coastal saltmarsh
- Replacement of losses with trees and vegetation of higher standards than currently exist
- Lack of ability to plant under 'dead spaces' created by overhead structures
- The costs of planting and maintaining trees

Most submissions raised the loss of remnant vegetation of Moonee Ponds Creek (Brackish Wetland) and Stony Creek (Coastal saltmarsh and Mangrove shrubland) to be the most significant in their view. The total loss of remnant vegetation associated with the project is 0.66 hectares (0.27 Hha) and 22 scattered indigenous trees. DELWP has modelled the majority of the area as having no strategic biodiversity values or values between 0.01-0.40 out of a maximum value of 1 (refer to Figure 46, Technical Report F). Given the strategic biodiversity values and the relatively low levels of clearing DEWLP consider this to be a 'moderate' risk

pathway (refer Appendix G, Technical Report F). Overall and considering the scale of the project these losses are considered to be very low.

With regards to minimising the loss of scattered indigenous trees, the project has been designed to minimise impact (where possible). However, I believe there are further opportunities to reduce losses by incorporating many of the scattered trees that occur within private land between New Street and the Newport Rail line, South Kingsville into the proposed public open space. This area is proposed to be a 'Neighbourhood Park' with landscaping. During the development of Technical Report F it was unclear whether scattered indigenous trees would be retained or removed and as such we took a conservative approach and assumed loss. However, I believe at least some of these trees could be incorporated into the park thus further reducing losses.

All losses of remnant vegetation are proposed to be offset following approval from the relevant authority (DELWP). It is acknowledged that there will be some spaces under structures that are not likely to support remnant vegetation, however, I do not believe there will be further 'downstream losses' as this does not currently occur downstream of existing structures within Monee Ponds Creek.

It was raised by submission 441 that significant efforts have been made by Melbourne Water and the Friends of Kororoit Creek to improve the waterway and the vegetation corridor since 2012. The project has committed to offsetting these losses through remnant vegetation offsets and proposed replanting of lost vegetation with plantings of higher standards. Given that Melbourne Water and City West Water manage land that will be impacted by the project consideration should be given to redrafting the EPR to also consult these authorities with the final planting arrangements proposed in the Landscape Plan.

With regards to commercial arrangements associated with tree loss the technical report is intentionally silent. Any commercial arrangements made to cover the loss and maintenance of planted trees between the City of Melbourne, Hobsons Bay City Council, Maribyrnong City Council and the Western Distributor Authority is not within the realm of this report. Similarly, to my knowledge it has not been determined how long the maintenance period will extend post construction. However, performance measures EP2 and EP6 Landscaping Plan (EP6) provide further opportunities for comment on the proposed final protection measures and landscaping plan.

## 8.0 Response to the Preliminary Matters and Further Information Request issued by the West Gate Tunnel Project Inquiry and Advisory Committee

Within the Preliminary Matters and Further Information Request issued by the West Gate Tunnel Project Inquiry and Advisory Committee dated 18 July 2017, items 51 and 52 pertained to ecology. The IAC requested:

51. Consideration of an EPR for light spillage for potential impacts to fauna during the operation of the project.

### Response:

Technical Report F acknowledges that light spillage has been noted to cause behavioural responses in some fauna groups (refer Section 5.3.5). In the case of the West Gate Tunnel project it is likely to impact a range of common fauna such as amphibians, birds and bats. In response to this a number of EPRs were developed to address potential impacts, specifically LVP3 Light Spillage and EP4. LVP3 contains a requirement to '*minimise light spillage during construction to protect the amenity of adjacent surrounding neighbourhoods, parks and community facilities*'. EP4 also has measures to '*minimise lighting impacts in known fauna habitats*', again focussed on the construction period. Within the risk assessments presented in Technical Report F both EPRs have been applied to construction and operational phases of the project. Given the projects operational life is significantly longer than its construction period I believe it warranted to consider either the amendment of an existing EPR or the development of a new EPR to address light spillage during operation. Should this be considered necessary by the IAC then such an EPR ought to address the design of lighting structures to minimise light spillage impacts in to known fauna habitats associated with Kororoit Creek, Stony Creek, the Maribyrnong River and Moonee Ponds Creek.

Additionally, the IAC requested:

52. Consideration of an EPR for shading (>50%) on vegetation and native fauna habitats during operation of the project.

### Response:

With regards to consideration of an EPR for shading (>50%) on vegetation and native fauna habitats during operation it should be recognised that the project has acknowledged impacts from shading and has proposed to offset all vegetation (indigenous and planted) lost due to shading. Given this I don't believe it necessary to create a new EPR.

## 9.0 Conclusion

Throughout the review of the submissions it became apparent that many submissions related to the loss of vegetation (remnant and planted), the proposed planting schedule (numbers and composition) and the proposed landscaping treatments including the creation of new reserves.

Given the submissions reviewed, my additional visual inspection and further reading of additional supporting material, I have recommended some minor changes to the wording as they relate to my technical report. These changes are outlined in Section 7.6.6.

With regards to losses of scattered indigenous trees I believe there are further opportunities to reduce losses by incorporating many of the scattered trees that occur within private land between New Street and the Newport Rail line, South Kingsville into the proposed public open space. Furthermore, I believe there could be further refinements of the landscape treatments to better align with existing local government and water authority strategies including:

- The Dynon Road Tidal Canal shared path, rehabilitation and bird sanctuary;
- Rehabilitation to the Dynon Road Wildlife Reserve
- Lower Stony Creek naturalisation
- Moonee Ponds Creek linear Park,
- Greening the Pipeline, and
- The City of Melbourne North and West Melbourne Urban Forest Precinct Plan 2014-2024.

## Declaration

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Planning Panel.



Cameron Miller

Dated 02 August 2017

## 10.0 References

- AECOM, 2017. West Gate Tunnel Project Environmental Impact Assessment-Ecology Assessment. Produced by AECOM for the Western Distributor Authority.
- DoEE, 2017. National Flying Fox Monitoring Viewer. Viewed on 1/08/2017 at: <http://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf>
- City of Melbourne (CoM) (2016). *Urban Forest Visual*, available at: <http://melbourneurbanforestvisual.com.au/#mapexplore><http://melbourneurbanforestvisual.com.au/#mapexplore> Administered by the City of Melbourne, Melbourne, Victoria.
- DEPI, 2013. '*Permitted clearing of native vegetation: Biodiversity assessment guidelines*'. Produced by the Department of Primary Industries. Victorian Government.
- Melbourne Water (2007). *Port Philip and Westernport Regional River Health Strategy, 2007*.
- Melbourne Water (2013). *Healthy Waterways Strategy: A Melbourne Water strategy for managing rivers, estuaries and wetlands*.
- Land Design Partnership (2006). *Kororoit Creek Regional Strategy 2005-2030*.

## ANNEXURE A - QUALIFICATIONS

### 10.1 Qualifications and Experience of Expert

My name is Cameron Miller and I am an Associate Director – Ecology at AECOM Australia Pty Ltd (AECOM). I also hold the title of National Practice Leader, Natural Resources with AECOM.

I completed a Bachelor of Science at the University of Melbourne in 1992 and a Masters of Science (Ecology and Management) at the University of Adelaide in 1996. I am also currently enrolled in the Graduate Certification of Arboriculture (University of Melbourne) and have partially completed this course.

### 10.2 Professional Associations

I am currently a member of:

- Environment Institute of Australia and New Zealand
- Australasian Network for Ecology and Transportation

### 10.3 Employment history and achievements

I have approximately 18 years professional experience in the field of ecology. I began working with AECOM in October 2009. Prior to AECOM, I worked for other consultancies (SMEC Australia and Environmental Resources Management) and government. Within government I worked for Parks Victoria as an ecologist, primarily to coordinate the development and implementation of monitoring protocols for pest plants and animals and several threatened flora and fauna species. I also have several years' experience working for both the Environment Protection Authority (Victoria) and the Department of Primary Industries (Queensland). During this period I worked on Environmental Impact Assessments (EIA), catchment monitoring and management and marine water quality testing.

I have been the lead author or verifier on over 200 ecological reports, including reports for the private sector, and State and Commonwealth governments. This work has included small scale projects and large infrastructure projects such as major roads and highways, bridges and large residential land releases.

I have received training and accreditation in the Department of Environment, Land, Water and Planning (formerly the Department of Sustainability and Environment) Vegetation Quality Assessment (VQA) assessment methodology in both 2009 and 2016. I have considerable experience in providing advice on meeting the Victorian Biodiversity Assessment Guidelines (BAG), 'Net Gain' assessments and the implementation of Precinct Structure Planning, Native Vegetation Precinct Plans (NVPP) and Vegetation Offset Management Plans (VOMP).

### 10.4 Publications and Technical Papers

Miller CJH and Dawson, M. (2008.). Mark-recapture aerial survey utilising natural markings of wild horses. *Wildlife Research*, 35(4) (2008), pp 365–370.

Large Macropod Monitoring Protocol. Parks Victoria (2005). Parks Victoria, Victoria, Australia.

Pest Plant Threat Monitoring Protocol. Parks Victoria (2005). Parks Victoria, Victoria, Australia.

Red Fox (*Vulpes vulpes*) Threat Monitoring Protocol. Parks Victoria (2004). Parks Victoria, Victoria, Australia.

European Rabbit (*Oryctolagus cuniculus*) Threat Monitoring Protocol. Parks Victoria (2004). Parks Victoria, Victoria, Australia.

Campbell, SJ and Miller, CJH (2002). Shoot and abundance characteristics of the seagrass *Heterozostera tasmanica* in the Westernport estuary (south-eastern Australia). *Aquatic Botany* 73(1) 2002. pp 33-46.

Campbell, SJ, Miller, CJH, Steven, A, & Stephens, A (2003). Photosynthetic response of two temperate seagrasses across a water quality gradient using chlorophyll fluorescence. *Journal of Experimental Marine Biology and Ecology* 291 2003. pp 57–78.

Carey, JM, Burgman, MA, Miller, C and Chee, YE (2005). An application of qualitative risk assessment in park management. *Australian Journal of Environmental Management* 12 (2005). pp 6-15.

## ANNEXURE B – CURRICULUM VITAE

## Cameron Miller

### Associate Director - Ecology



#### Qualifications

Bachelor of Science, 1992 (Melbourne University)  
 Masters of Science - Ecology & Management, 1996 (University of Adelaide)  
 Graduate Certificate in Arboriculture, in progress (Melbourne University)

#### Affiliations

- Member of the Environment Institute of Australia and New Zealand
- Member of the Ecological Society of Australia
- Member Box-Ironbark Farm Forestry Network (BIFFN) and hardwood plantation grower
- Former president Australian Marine Conservation Society (AMCS): Victorian branch

#### Publications and Technical Papers

Campbell, SJ and Miller, CJH (2002). Shoot and abundance characteristics of the seagrass *Heterozostera tasmanica* in the Westernport estuary (south-eastern Australia). *Aquatic Botany* 73(1) 2002. pp 33-46.

Campbell, SJ, Miller, CJH, Steven, A, & Stephens, A (2003). Photosynthetic response of two temperate seagrasses across a water quality gradient using chlorophyll fluorescence. *Journal of Experimental Marine Biology and Ecology* 291 2003. pp 57-78.

Carey, JM, Burgman, MA, Miller, C and Chee, YE (2005). An application of qualitative risk assessment in park management. *Australian Journal of Environmental Management* 12 (2005). pp 6-15.

Miller, CJH, Campbell, SJ and Scudds, S (2005). Spatial variation of *Zostera tasmanica* across an environmental gradient in south-eastern Australia. *Marine Ecology Progress Series* 304 (2005). pp 45-53.

Miller CJH and Dawson, M. (2008). Mark-recapture aerial survey utilising natural markings of wild horses. *Wildlife Research*, 35(4) (2008), pp 365-370.

#### Career History

Cameron is an Associate Director with AECOM with over 18 years professional experience. Cameron is formerly trained as an ecologist having completed a masters and undergraduate degree in this discipline. In addition, Cameron is also currently completing a Graduate Certificate in Arboriculture.

Cameron has been consulting for approximately ten years and has worked on major residential and commercial developments, linear infrastructure and roads, threatened species monitoring and undertaking ecological reviews and management planning for government agencies. Professionally, Cameron has designed and implemented ecological surveys, environmental impact assessments and ecological approvals within south-eastern Australia.

Cameron has significant experience with Commonwealth, Victorian and NSW environmental legislation and policy and has provided expert planning advice to a range of Victorian clients.

Prior to consulting, Cameron worked for a number of government agencies including Parks Victoria, the Environment Protection Authority (Victoria) and the Department of Primary Industries (Queensland).

#### Expert Evidence Experience

Cameron also has experience providing expert evidence at Victorian Planning Panels and the Victorian Civil and Administrative Tribunal including:

- Horsham Planning Scheme Amendment C72 – Planning Panels Victoria.
- Stockman Project – Terrestrial Fauna Expert Witness – Planning Panels Victoria.
- Amendment C23 For Searoad Ferries, Queenscliff.
- VCAT expert evidence - McLeers Hill, 143 Nepean Highway, Dromana, Victoria.
- VCAT expert evidence – Aqueduct Road, Langwarrin.

Cameron has also overseen expert panel advice for staff including:

- Birregurra Quarry (MCG Group).
- Princess Highway Duplication (VicRoads).

## Selected Experience

### ***Sites of Biodiversity Significance (SOBS): Biodiversity Conservation and Site Management Plans, Melbourne Water***

Cameron provided project coordination (Project Director) and quality review on a project to deliver the first five SOBS management plans. Sites included Monbulk Creek Retarding Basin, Old Joes Creek Retarding Basin, Police Road Retarding Basin, Riddell Road Retarding Basin and Cardinia Creek. The outcomes of the project were the delivery of high quality reports suitable for public dissemination that provide Melbourne Water with risk-based approach to management and clearly articulate program works for a 10 year period.

### ***Stockman Project – Environmental Effects Statement***

AECOM was engaged to undertake all fauna related services for a proposed Copper and Zinc mine in the high country of Victoria (Benambra). AECOM's team implemented a range of survey techniques to monitor animal abundance including pitfall trapping, hair tuning, infra-red camera survey, Anabat, call play-back and spotlighting. We also completely reviewed the existing knowledge relating to the site and implemented a risk assessment to conform to the requirements of the EES. Cameron presented at planning panel on this project.

### ***Western Highway – Anthony's Cutting Realignment***

Cameron was the Ecological Team Leader for a major infrastructure project west of Melbourne. Cameron was responsible for ensuring all ecological needs on site were met and ensuring compliance with government permit conditions. Cameron supervised up to four ecologists in the active search, capture and translocation of vertebrate fauna, including threatened species, habitat hectare analysis and reporting and general permitting advice.

### ***Hume Freeway Baseline Environmental Assessment***

Cameron worked with a consultancy engaged by VicRoads to develop a Roadside Conservation Management Plans for the Hume Freeway. This involved the production of a Roadside Environmental Baseline Report (REBR) for the entire length of the Hume Freeway from the intersection of the Craigieburn Bypass and metropolitan Ring Road to the NSW/Vic border. The aim of the REBR was to provide an overview of key environmental values and environmental baseline conditions which exist along the roadside.

### ***Woolgoolga to Ballina, Package 6***

AECOM' ecologists managed by Cameron completed a number of pre-clearance surveys for Roads and Maritime Services associated with the Pacific Highway upgrade, Package 6. This work involved tree hollow surveys, threatened species surveys and weed mapping. Cameron reviewed all outputs and provided QA/QC for the project.

### ***Southbank Tram Depot Upgrade***

Cameron was engaged as a sub-consultant by Hyder Consulting to undertake a flora and fauna assessment of Yarra Trams Southbank depot and an associated area to facilitate the upgrade of the Depot. This work involved project management, coordinating a team of ecologists, technical quality control and reporting.

### ***Peechelba Railway line and Station, Flora and Fauna Assessment***

AECOM was engaged by VicTrack Access (VicTrack) to assess an area of crown land that contained former railway line and station infrastructure. This assessment was conducted to inform VicTrack of opportunities and constraints for future management options, including potential lease and/or divestment arrangements.

### ***Desalination Pipeline Post-construction Monitoring, Victoria***

Cameron is currently the project manager for a 5 year monitoring program to monitor threatened vertebrate fauna and fish post-construction of the Victorian Desalination Plant water supply pipeline. Southern Brown Bandicoot *Isodon obesulus obesulus* and Growling Grass Frog *Litoria raniformis* are the two key species targeted during these surveys, which are undertaken twice per year. Fish surveys are undertaken quarterly. The reporting requirements include a detailed technical report and a public annual report.

### ***Wodonga Rail Flora and Fauna Assessment***

Seven precincts of land operated by VicTrack Access in the Albury-Wodonga region were assessed for their flora and fauna values, in particular Commonwealth listed vegetation communities and various Commonwealth and State listed threatened species. The precincts included decommissioned track and siding areas as well as active trackside environment. AECOM coordinated and contributed to the subsequent report informing VicTrack of their obligations regarding permitting and future management should they choose to dispose of any of the precincts.

### ***Melbourne Metro Rail***

Cameron was the coordinator of all ecological works associated with a rail tunnel and stabling yards for PTV. This involved scoping project requirements, undertaking desktop and comprehensive field based assessments, writing specialist reports and assisting with planning permits, referrals risk assessment and specialist advice.

### ***Armstrong Creek (Geelong) Native Vegetation Precinct Plan***

Cameron coordinated the ecological assessment and reporting of a 650 ha site located on the outskirts of Geelong. The site was being re-zoned within Geelong's Urban Growth Zone and required the development of a Precinct Structure Plan and detailed Native Vegetation Precinct Plan. As Project Director, Cameron ensured that the appropriate data was collected, quality was maintained and reporting outputs were of a high standard. In addition, it was Cameron's role to make sure both the client and the regulators were aware of the

findings and were engaged in the decision making process such that an acceptable outcome was reached by all parties.

#### ***Alexandra – Eildon Water supply pipeline***

Cameron worked on a project for Goulburn Valley Water (GVW) to undertake an ecological assessment of the proposed Alexandra / Thornton / Eildon water supply pipeline. Cameron was engaged as the Project Director to ensure that work was undertaken in a timely fashion, was correct and of appropriate quality and met the client needs.

This assessment informed GVW of their requirements in regards to the relevant National and State legislation, provided advice on ecological constraints of the development, and methods to mitigate and minimise unacceptable environmental impact.

#### ***Stradbroke Landscape Zone Management Plan***

Cameron coordinated and undertook a project involving the vegetation assessment (habitat hectares) of 22 state reserves to determine the condition and threatening processes across the landscape. His other tasks included facilitation of a risk assessment workshop and preparation of a management plan.

#### ***Net Gain and Ecological Assessments***

Cameron has undertaken numerous net gain and ecological assessments of land within Melbourne's growth boundary and within many parts of Victoria. Cameron has undertaken all aspects of these assessments including field components, analysis and offset quantification, planning and permitting components.

#### ***Growth Areas Authority Biodiversity Assessment***

Cameron was Project Director on a major investigation to study biodiversity patterns within and outside Melbourne's Urban Growth Zone (UGZ). This information was then used to analyse and determine suitable sites for inclusion within the UGZ. This project also involved detailed field assessments within a number of areas including habitat hectare analysis, mapping, targeted flora and fauna surveys. As part of his role as Project Director, Cameron had to ensure that field work was programmed correctly, resources allocated, quality maintained and that the client was satisfied with completed products.

#### ***Swan Island Kangaroo Management Plan***

Cameron coordinated and implemented a project to estimate the abundance of Eastern Grey Kangaroos on a Department of Defence base on Swan Island, Victoria. This information has improved Defence's understanding of the population at Swan Island and will aid any future kangaroo management. In addition, further works were undertaken to investigate overall herbivore numbers and impacts which then fed into the development of a herbivore management plan for the site.

#### ***Environmental Impacts Assessment of Sand Dredging, Port Stanvac, SA***

Cameron provided input into a large-scale environmental impact assessment investigating the effects of sand dredging on marine sediment communities in Gulf St Vincent, SA. The project was a collaboration between the University of Adelaide and the SA Coastal Board and was undertaken as part of Cameron's Masters thesis.

#### ***National Park Risk Assessments***

In conjunction with the University of Melbourne, Cameron implemented a series of ecological risk assessments in terrestrial and marine national parks. Through this process the values and risks were identified and ranked according to potential impacts. This information subsequently fed into management planning.

#### ***Gisborne Marshlands Ecological Assessment***

Cameron was involved in an ecological assessment of the Gisborne Racecourse Marshlands Reserve (GRMR). The aim of the assessment was to provide information required to complete an *Environment Protection and Biodiversity Act 1999* (EPBC) referral for submission to the Department of the Environment, Water, Heritage and the Arts (DEWHA).

#### ***Melbourne Water Alliance***

Cameron was involved in coordinating all ecological work associated with a \$100 million alliance between Melbourne Water and three private businesses. As Manager Ecological Services, Cameron was engaged to manage all 'ecological services' related to the role-out of the river renewal program. As such Cameron has undertaken or provided management and quality review support to over 40 projects in the 2008-2009 period. Projects ranged from small-scale assessment and permitting advice to large-scale assessment of major man-made wetlands.

#### ***Plenty Gorge Marshlands Ecological Assessment***

Cameron was Project Director on a project for the City of Whittlesea to determine whether it is possible to incorporate floodlighting as part of the proposed Hawkstowe sports field development, without adversely impacting to native fauna (terrestrial and aquatic). The scope of works included an Ecological Impact Assessment (EIA) which analysed potential impacts from floodlighting of the proposed sports field development on ecological values of the Morang

#### ***Training***

Habitat Hectare Assessment (certificate of competency 2009 and 2016)

Advanced Project Management.

Basic Fire Awareness (Department of Sustainability & Environment)

Resource Officer – Australian Incident Management System (AIMS) (Department of Sustainability & Environment)

Cross-Cultural Training. Parks Victoria.