

Mordialloc Bypass Minister's assessment of environmental effects

June 2019



Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



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Glossary

AEP	Annual Exceedance Probability
ASS	Acid sulphate soils
BPEMG	Best practice environmental management guidelines
CEMP	Construction environment management plan
CHMP	Cultural heritage management plan
CNVMP	Construction noise and vibration management plan
DELWP	Department of Environment, Land, Water and Planning
EE Act	<i>Environment Effects Act 1978</i>
EES	Environment effects statement
EMF	Environmental management framework
EPA	Environment Protection Authority
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>
Ha	Hectares
IAC	Inquiry and advisory committee
MFFB	Multi-function fauna barrier
MNES	Matters of national environmental significance
MRPV	Major Road Projects Victoria
MTIA	Major Transport Infrastructure Authority
OEMP	Operational environment management plan
PASS	Potential acid sulphate soils
PFAS	Per- and polyfluoroalkyl substances
PM ₁₀	Particulate matter 10 micrometres or less in diameter
PM _{2.5}	Particulate matter 2.5 micrometres or less in diameter
PONL	Projective objective noise limit
PSA	Planning scheme amendment
P&E Act	<i>Planning and Environment Act 1987</i>
SEPP	State environment protection policy
TMP	Transport management plan
TNRP	Traffic Noise Reduction Policy
TRG	Technical reference group
TSP	Total suspended particulates
VITM	Victorian integrated transport model
WSRD	Water sensitive road design

Executive summary

On 13 September 2017, following receipt of a referral from VicRoads under *the Environment Effects Act 1978*, I decided that an environment effects statement (EES) was required for the Mordialloc Bypass Project (project).

Responsibility for the proposed project moved from VicRoads to Major Road Projects Victoria (MRPV) during the development of the EES. Subsequently, MRPV prepared an EES which I authorised for public exhibition. The EES was exhibited for public comment from 26 October to 14 December 2018.

On 14 October 2018, I appointed an Inquiry and Advisory Committee (IAC) to consider public submissions, the project's EES and a draft planning scheme amendment for the project. Planning Panels Victoria received 112 submissions and the IAC held a public hearing from 25 February to 15 March 2019. The IAC provided its report to me on 2 May 2019. The IAC's report, EES documentation and other material including submissions and documents tabled at the IAC hearing have informed the preparation of this assessment of the environmental effects of the project.

It is my assessment that the project can proceed with acceptable environmental effects, subject to project modifications and an environmental management regime incorporating environmental mitigation, management and monitoring measures which are endorsed in this assessment. I am also satisfied that impacts on matters of national environmental significance can be managed within acceptable limits.

My assessment includes specific recommendations for the attention of decision-makers including the Minister for Transport and Melbourne Water, as well as the proponent. I will provide my assessment to statutory decision-makers that will be asked to provide approvals for the project under Victorian law. Decision-makers must consider this assessment before deciding whether and how the project should proceed.

The project is a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to potential impacts on matters of national environmental significance. Accordingly, the Victorian EES process served as the accredited assessment process for EPBC Act purposes, pursuant to the bilateral agreement between the Australian and Victorian governments. My assessment will be provided to the Australian Minister for the Environment to inform her decision about whether and under what conditions to approve the project.

1. Introduction

On 27 July 2017, VicRoads referred the project to me under the *Environment Effects Act 1978* (EE Act).

On 13 September 2017, I decided that an environment effects statement (EES) was required. My decision to require an EES included my procedures and requirements for the EES, in accordance with section 8B(5) of the EE Act, specifying that the EES must investigate and report on:

- the habitat value and quality of wetlands and other habitats adjoining or traversed by the project, especially regarding threatened species;
- the surface water and groundwater systems which contribute to the health and habitat quality of adjacent and nearby wetlands, including Ramsar-listed Edithvale Wetlands;
- Indigenous cultural heritage values that may occur within the project alignment;
- the containment and management of potentially contaminated soils and potential acid sulphate soils; and
- amenity values of the adjacent land, especially residential and parkland.

While originally referred to me by VicRoads, responsibility for the project and EES was transferred to the Major Road Projects Authority when it was established in mid-2018. Through machinery of government changes, the Major Road Projects Authority was subsequently renamed Major Road Projects Victoria (MRPV). Any reference to VicRoads or Major Road Projects Authority should be read as MRPV as the current proponent.

1.1 Purpose of this document

This document constitutes my assessment of the environmental effects of the project. It represents the final step in the EES process and provides authoritative advice to decision-makers on the likely environmental effects of the project, their acceptability and how they are to be addressed in relevant statutory decisions. My assessment is largely informed by the report of the Inquiry and Advisory Committee (IAC) that I appointed together with the EES and public submissions.

2. Project description

The EES described the project as a dual carriageway four-lane freeway divided by a centre median. The project is approximately 9.7km in length, comprising two two-lane 7.5km-long carriageways (with a path for walking and cycling) along a greenfield alignment. The project is intended to connect the Mornington Peninsula Freeway's current terminus at Springvale Road with the Dingley Bypass east of Boundary Road. Grade separated interchanges will connect the freeway to existing arterial roads, except for Old Dandenong Road, which would be overpassed, and the Dingley Bypass, where the at grade intersection would be controlled by traffic lights.

The greenfield portion of the project includes twin 500m long bridges on piles to span Mordialloc Creek and the associated Waterways Wetlands.

The area directly affected by the project comprises land currently used for recreational reserves, wetlands, residential properties, and industrial and commercial properties. Parts of the project are within the South Eastern Green Wedge, and other parts follow the green wedge/urban growth boundary.

Works are required to connect the new road to the existing Mornington Peninsula Freeway as a part of the project. These works will include 2.2km of roadworks along the freeway south-east of Springvale Road and an upgrade of the existing Thames Promenade interchange by the addition of north-facing ramps. The project also includes specific works on existing intersecting roads predicted by modelling to carry significantly increased traffic volumes as a direct result of the project.

When formally referred under the EE Act, the preferred option presented in the referral was for an arterial road with a grade separated interchange at Springvale Road and all other intersections controlled by traffic lights. However, MRPV revised its preference and adopted a four lane, freeway-standard road. It added the north-facing ramps at Thames Promenade at the same time.

The project is described in more detail in Volume 1, Chapter 6 of the EES. The project and its setting are shown in Figure 1.

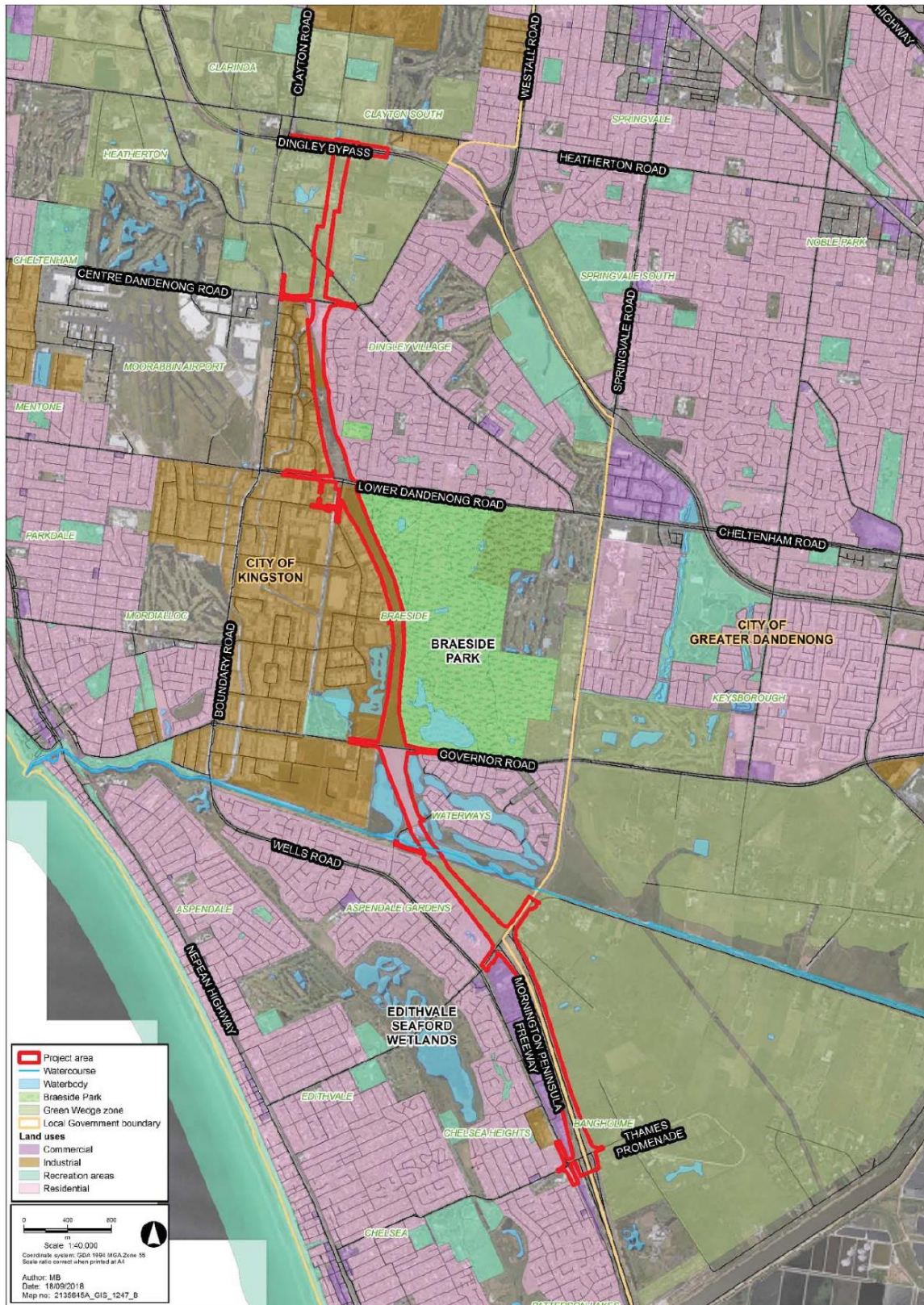


Figure 1: Project alignment and setting (EES, p.6-3).

3. Statutory processes

3.1 Environment Effects Act

My decision to require an EES obliged the proponent to investigate the potential extent, significance and related uncertainties of the project's environmental effects, particularly on the ecology, hydrology, and amenity of adjacent land.

Draft scoping requirements for the EES were exhibited for public comment on 14 March 2018. In May 2018, I issued final scoping requirements that specified the range of matters to be addressed in the EES. The Department of Environment, Land, Water and Planning (DELWP) convened a technical reference group (TRG) in accordance with normal EES practice to provide advice to the proponent and DELWP on the preparation of the EES.

MRPV's EES was placed on public exhibition from 26 October to 14 December 2018. A draft planning scheme amendment (PSA) to the Greater Dandenong and Kingston planning schemes (Amendment GC107) was included in the exhibited EES.

On 14 October 2018, with the consent of the Governor in Council, I appointed an inquiry under section 9(1) of the EE Act, to review submissions and inquire into the environmental effects of the project, in accordance with its terms of reference, which I approved on 8 October 2018. The inquiry members were also appointed as an advisory committee under section 151 of the *Planning and Environment Act 1987* (P&E Act) to consider the draft PSA. Planning Panels Victoria received 112 submissions, including submissions from state and local government bodies on the EES and the draft PSA.

The IAC held a directions hearing on 31 January 2019, followed by a public hearing over 13 sitting days from 25 February to 15 March 2019. The IAC provided its report to me on 2 May 2019. The IAC's report, along with other relevant resources, has informed my preparation of this assessment of the environmental effects of the project under the EE Act.

I will provide my assessment to statutory decision-makers that will be asked to provide approvals for the project under Victorian law. Decision-makers must consider this assessment before deciding whether and how the project should proceed.

3.2 Planning and Environment Act

The P&E Act sets out processes for the amendment of Victorian planning schemes. A PSA to the Greater Dandenong and Kingston planning schemes is required to provide comprehensive statutory planning controls for the project. In the absence of such a PSA, the project would be subject to multiple and uncoordinated permit requirements under various provisions of the relevant planning schemes. The draft PSA included in the exhibited EES is discussed in Section 4.2.

3.3 Aboriginal Heritage Act

The *Aboriginal Heritage Act 2006* sets out triggers and requirements for the preparation and approval of cultural heritage management plans (CHMPs). One trigger for the need for a CHMP is the requirement under the EE Act for an EES. The Aboriginal Heritage Act also provides for approval of a CHMP by the relevant registered Aboriginal party. For localities where no registered Aboriginal party has yet been appointed (as is the case for the project), responsibility for approval of a CHMP rests with the Executive Director Aboriginal Victoria.

3.4 Other Victorian statutory approvals

The project requires operational Victorian statutory approvals. Those consents are generally technical in nature and do not require engagement with third parties:

- consent to undertake works on or across a waterway under the *Water Act 1989*;
- a permit to remove listed flora and/or fauna from public land under the *Flora and Fauna Guarantee Act 1988*;
- if needed, a permit to take wildlife under the *Wildlife Act 1975*; and
- consent to undertake works on a road and to connect to a freeway under the *Road Management Act 2004*.

3.5 Commonwealth statutory approval

On 31 October 2017, the proponent referred the project to the Commonwealth Minister for the Environment and Energy (Referral EPBC 2017/8091) for a determination on whether the project is a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

On 30 January 2018, the delegate for the Minister determined the project to be a controlled action requiring assessment and approval under the EPBC Act because of its potential significant impacts on matters of national environmental significance (MNES). The EES is an accredited assessment process under a bilateral agreement between the Australian and Victorian governments. Hence, my assessment will inform the Commonwealth Minister’s decision about whether and under what conditions to approve the project, therefore fulfilling the assessment requirements for MNES under the EPBC Act. My assessment of the potential impacts on MNES is addressed in Appendix A.

4. Assessment and planning framework

This part of my assessment:

- summarises my approach to assessing the environmental effects of the project;
- explains relevant aspects of the regulatory framework and proposed environmental control regime that have informed my assessment; and
- sets out my analysis and findings on the project's effects.

4.1 Consideration of environmental effects

My assessment has been informed by consideration of the EES, public submissions, evidence tabled with the IAC, information and submissions presented at the IAC's public hearing, the IAC report and other relevant resources. Legislation, policy, strategies and guidelines, summarised in Chapter 3 of the EES, and the objectives and principles of ecologically sustainable development, also contextualise my assessment.

Evaluation objectives

To provide an integrated structure for this assessment, key aspects of legislation and statutory policy have been synthesised into a set of evaluation objectives. These objectives are derived from the draft evaluation objectives included in the scoping requirements for the EES and used by MRPV in its assessment of alternatives and effects within the EES. The IAC also assessed the project having regard to the draft evaluation objectives.

The evaluation objectives presented here have been finalised following review by the IAC and my department and have been slightly reconfigured to align with the structure of this assessment. No substantive changes have been made.

Table 1: Final evaluation objectives.

Transport efficiency, capacity and safety: To provide for an effective connection between the Mornington Peninsula Freeway and Dingley Bypass, to improve travel efficiency, road safety and network capacity, as well as improve amenity and local transport networks in the Aspendale/Dingley area.

Biodiversity: To avoid, minimise or offset potential adverse effects on native vegetation, listed migratory and threatened species and communities, as well as habitat for other protected species.

Water, catchment values and hydrology: To minimise adverse effects on groundwater, surface water and floodplain environments and flooding levels, as well as minimise effects on water quality and beneficial uses of downstream environments, including the Edithvale-Seaford Ramsar site.

Noise and vibration: To minimise adverse noise and vibration effects on nearby residents and land uses, having regard to relevant limits, targets or standards.

Landscape values and visual amenity: To minimise adverse effects on landscape values, visual amenity and recreational values of public open space and on residents' visual amenity, to the extent practicable.

Land contamination and acid sulphate soils: To prevent adverse environmental or health effects from disturbing, storing or influencing the transport/movement of contaminated or acid-forming material.

Air quality: To minimise adverse air quality and other amenity effects on nearby residents and land uses, having regard to relevant limits, targets or standards.

Cultural heritage: to avoid or minimise adverse effects on Aboriginal or historic cultural heritage.

Land use and planning: To minimise potential adverse land use and planning effects, including impacts on open space.

Social and economic: To minimise potential adverse social and economic effects, including impacts on open space, amenity, existing infrastructure, business functionality and access.

4.2 Management of environmental effects

Framework for environmental management

The EES proposes an environmental management regime to be given statutory weight via a draft PSA exhibited with the EES. The draft PSA includes an incorporated document with conditions that include establishing obligations for the preparation of an environmental management framework (EMF) and environmental performance requirements (EPRs). This model has been used for environmental management of several recent major public infrastructure projects which have been approved following assessment under the EE Act.

Without prejudice to any decisions that may follow in respect to the draft PSA, I am satisfied in principle that the proposed environmental management approach, under which the EMF must be prepared to my satisfaction before project works may commence, is appropriate. An EMF is needed to establish clear accountabilities and framework for environmental management for both construction and operation.

Chapter 23 of the EES sets out the proposed EMF including the exhibited EPRs and use of an environmental auditor. The responsibilities and accountabilities for the EMF involves MRPV and the contractor, as well as VicRoads during the operational phase. The appointed contractor’s responsibilities will be included as contractual requirements, including the preparation of an environmental management strategy, construction environmental management plan (CEMP) and other specific environmental management plans (EMPs), consistent with the approved EMF. At the completion of the project, VicRoads would become responsible for the ongoing operation and maintenance of the infrastructure and would need to prepare an operational environmental management plan (OEMP). The broad structure of the EMF was endorsed by most submitters and the IAC (Figure 2).

An essential part of the proposed EMF is the EPRs, which are proposed to set relevant environmental standards, mechanisms and outcomes which MRPV and its contractors need to implement to mitigate or manage the environmental effects of the project. The EPRs were the subject of many submissions and focussed consideration through the IAC hearing. This led to MRPV tabling updated versions of the EPRs during the hearing, with refinements resulting from further consideration of issues raised by submitters and advice from relevant experts. The IAC’s report includes its preferred version of the EPRs, with changes reflecting its specific recommendations on matters examined through the EES and hearing. My assessment of EPRs is summarised in Appendix B.

Kingston City Council’s submission questioned whether the EPRs as exhibited in the EES provide sufficient scrutiny of management measures and plans, as it considered it to be less than for other recent major projects. The proposed EPRs have various plans being prepared and approved under the EPRs by the project team (contractor and MRPV) without independent review or approval (Table 2). The Council argued the need for at least a third-party auditor to review plans called up as part of the EPRs and preferably for either Minister for Planning or state agency approval of the plans, rather than just the contractor or MRPV. The IAC agreed with this concern and made recommendations to this effect for specific plans required by EPRs, as discussed in more detail within the remaining sections of this assessment.

The IAC was comfortable that the proposed EMF and incorporated document in the draft PSA provided enough transparency and certainty for managing environmental effects of the Project, subject to the changes it proposed. This included explicitly strengthening the role of the independent reviewer and environmental auditor in relation to the level of transparency and scrutiny for certain plans required under EPRs. I recommend that the MRPV publishes all environmental audits on a publicly accessible website. In general, my assessment supports the recommendations of the IAC, subject to the specific conclusions and recommendations of my assessment in relation to specific EPRs examined in the sections below. The final

EPRs must be updated by the proponent in consultation with DELWP prior to the proponent submitting them for my approval together with the proposed EMF.

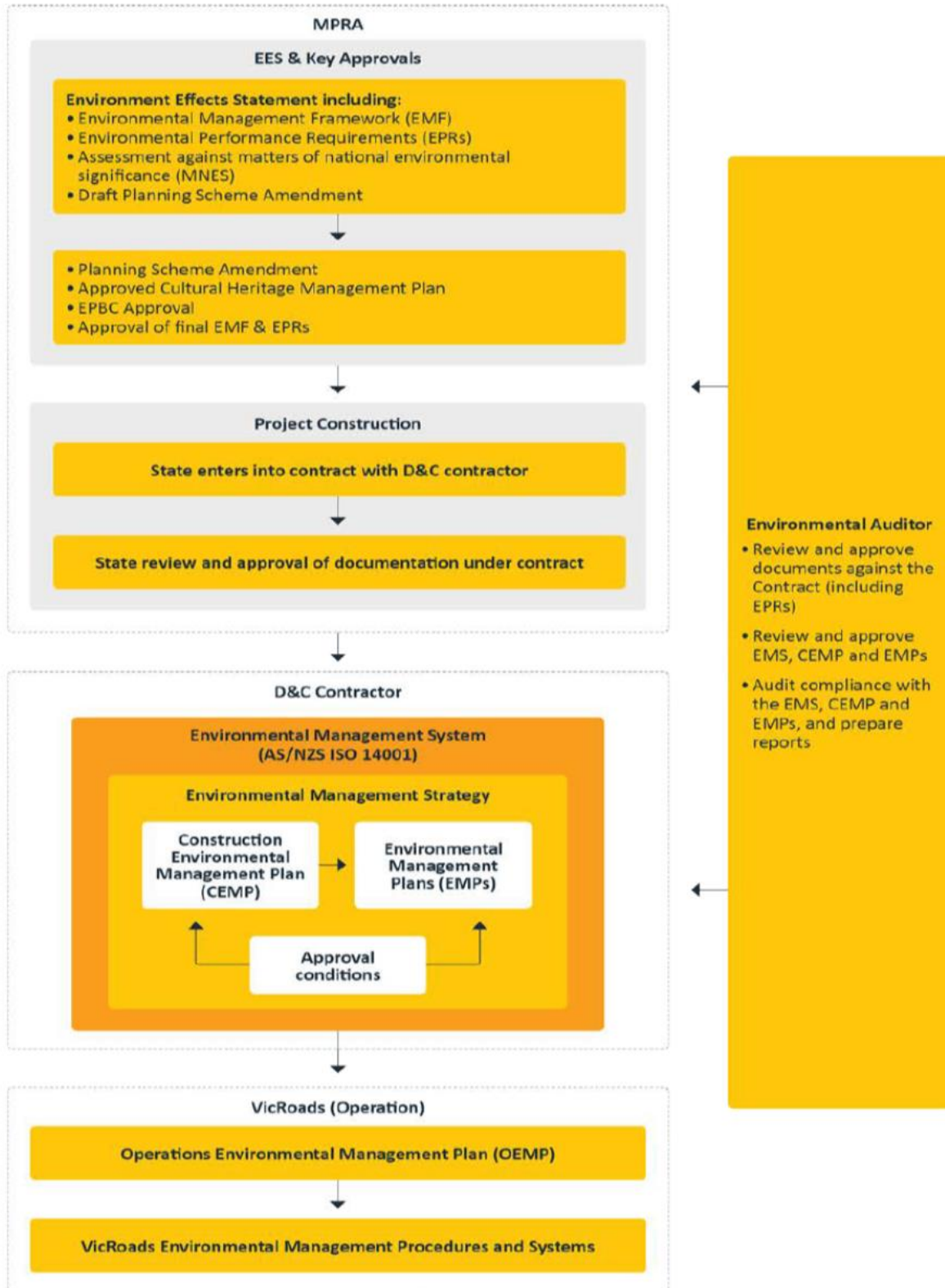


Figure 2: Proposed environmental governance framework (EES, p. 23-5).

Table 2: Proposed environmental management documents and responsibilities (EES, Table 23.5).

Document	MRPA	Contractor
Environmental management framework with EPRs ¹	Prepare	Comply
Contractor’s environmental strategy	Approve	Prepare and implement
Contractor’s environmental management system	Review and evaluate	Maintain
Construction environment management plan	Approve	Provide and implement
Soil management plan	Approve	Provide and implement
Landfill gas management plan	Approve	Provide and implement
Water management and monitoring plan	Approve	Provide and implement
Community and stakeholder management plan	Approve	Provide and implement
Transport management plan	Approve	Provide and implement
Construction noise and vibration management plan	Approve	Provide and implement
Sustainability management plan	Approve	Provide and implement

¹Approval by the Minister for Planning

The EMF described in the above figure includes an environmental management strategy to be prepared by the contractor, bridging the approved EMF and the contractor’s specific management plans and approaches for implementing EPRs. The EES describes the role of this contractor document as demonstrating to MRPV how it will implement the EMF. As noted by Kingston City Council this has the potential to create an unnecessary layer and some confusion, given the EMF provides the authoritative framework for environmental governance and management for the project, for any party involved in its construction and operation. The EMF is to be given effect through the contractor’s CEMP and other plans prepared under EPRs and there is also the contractor’s environmental management system, which may add to the confusion.

While MRPV (and contractor) may consider an environmental management strategy to have some utility, it is not clear from the EES how this extra layer will assist either the contractor or regulators. Therefore, I recommend that EPR EM1 be amended to clearly reflect the core role of the EMF (as specified in the proposed planning approval) in providing the framework for both MRPV and the contractor to mitigate effects and achieve environmental outcomes via the specified EPRs and core plans. Should MRPV consider the environmental management strategy to still be essential, this would need to be clearly demonstrated in the final EMF submitted for my consideration.

The proposed EMF in the EES states that it will be updated and re-assessed by the Minister for Planning if traffic lanes are proposed to be added to the project in the future. However, as noted by the IAC this needs to be deleted from the EMF, as the environmental effects of additions or changes to the project (e.g. for a six-lane freeway) have not been assessed. MRPV acknowledged this and accepted the EMF would need to be amended and that if future lanes were to be required, appropriate statutory processes would be addressed (such as potential referrals under the EE Act and EPBC Act).

Planning controls

A PSA to the Greater Dandenong and Kingston planning schemes is proposed to provide project specific planning controls for the project. In the absence of a PSA, the project would be subject to multiple and uncoordinated requirements under various provisions of the two planning schemes. A draft PSA (Amendment GC107 to the Greater Dandenong and Kingston planning schemes) was prepared by the proponent and included in the exhibited EES in Attachment 2 to the main report. The purpose of the draft PSA is to:

- facilitate the delivery of the project in a timely, coordinated and consistent manner;
- establish a framework to manage environmental effects during construction and operation; and

- ensure the project can be planned with certainty and commence without delay.

In broad terms, the proponent’s draft PSA proposes to:

- insert an incorporated document ‘Mordialloc Bypass (Freeway) Incorporated Document, October 2018’ (incorporated document) into the Greater Dandenong and Kingston planning schemes to allow the use and development of land for the project in accordance with the specific control in the incorporated document;
- apply the Specific Controls Overlay (SCO) to land required for the project;
- apply the Public Acquisition Overlay (PAO) to four parcels of land in Braeside to facilitate the truncation of Woodlands Drive;
- amend the boundary of the Heritage Overlay (HO104) that applies to the Braeside Park; and
- require, through secondary consent, an EMF for the project.

The draft incorporated document includes a specific condition requiring an EMF to be prepared and approved by the Minister for Planning before main construction works commence and defines preparatory buildings and works that may be undertaken before it is approved. The EMF needs to include the EPRs applicable to the design, construction and operation of the project. Other conditions in the draft incorporated document include actions being undertaken to the satisfaction of the Minister for Planning or the Secretary of DELWP.

Under the proposed arrangements, the Minister for Planning has been identified as the planning authority for the PSA while Greater Dandenong and Kingston city councils will remain responsible for the administration and enforcement of the planning schemes.

Kingston City Council suggested changes to the proponent’s draft incorporated document and these changes were discussed at the IAC hearing. In response, the proponent tabled a revised draft incorporated document that included minor changes from the exhibited copy (document 93, dated 14 March 2019). The IAC accepted revisions proposed by MRPV and supported only one minor change proposed by Council.

As discussed in Section 5.8, I support the IAC’s recommendation that further assessment and consultation between the proponent, Kingston City Council and Parks Victoria is required to determine the final boundary of HO104.

During the IAC hearing, the proponent and other parties including the Kingston City Council agreed to a modified alignment for Woodlands Drive. With this modified alignment, no land acquisition is required and the PAO can be deleted from the draft PSA. I support this.

As noted by MRPV at the public hearing the environmental effects of additions or changes to the project (e.g. for a six-lane freeway, as opposed to a four-lane freeway) have not been assessed through the EES process. However, the draft incorporated document does not define the extent of the project in this regard. The incorporated document will need to be amended to address this matter, consistent with the findings of this assessment, and then should further lanes be required in the future, appropriate statutory processes would need to be considered (such as planning requirements under the relevant planning schemes).

5. Assessment of environmental effects

On balance, it is my assessment that the project can meet its objectives, and that its environmental effects will be acceptable, provided the recommendations of this assessment are adopted and implemented.

The IAC made several findings and recommendations in respect of the project. My response to its key findings and recommendations, along with my assessment of the main environmental effects of the project, are detailed in the sections below.

The IAC commented that the EES “has correctly focussed on the consideration of alternatives for the project, rather than alternatives to the project”. This is an overly narrow interpretation of the Ministerial Guidelines; the nature of the project is accepted but the EES process does not preclude other possible ways of addressing the underlying challenges. Hence, the project should be considered in the context of the traffic network of the area and its limitations, which the project was conceived to address, not as a discrete infrastructure project that provides “a missing link.”

Some submitters argued that the project represents a poor allocation of government resources which might better be used, for example, to fund public transport upgrades. However, the EES process examines the potential impacts of projects and their relevant alternatives; it is not designed for strategic evaluation of policies or drivers for infrastructure provision. Such policy and strategic considerations occur at a higher level under the *Transport Integration Act 2010* and through strategic planning at a metropolitan or regional scale (e.g. Plan Melbourne). As the transport network issues in the Mordialloc vicinity have been recognised at a strategic level for some time, the EES examined the proponent’s preferred approach to addressing those issues.

It is essential that this assessment deals robustly with the acceptability of the environmental effects of the project, having regard to the EE Act and the Ministerial guidelines, as well as the EPBC Act. However, it is not a function of the EES process to interrogate the established policy setting and rationale for the project. Nevertheless, the fact the project corridor has been provided for through land use planning prescriptions over time does not detract from the need for an objective assessment of its environmental effects now, against current environmental policy objectives and criteria.

It is not necessary that all adverse impacts (including risks) of an infrastructure project such as Mordialloc Bypass be eliminated or avoided. Rather, impacts should be mitigated as far as practicable and a judgment made about whether the residual impacts are acceptable, having regard to the nature of the affected environmental values. In both assessing impacts and choosing and applying mitigation measures, it is essential that a systems approach is taken, so that actions to mitigate certain impacts do not exacerbate other impacts to an unacceptable or unnecessary degree. For example, structures to reduce noise or to protect birds from vehicle collisions might have adverse visual impacts. Vegetation planted to mitigate visual impacts might compromise the integrity of threatened ecological communities. Management of stormwater to avoid flooding impacts might change the inflow regimes or water quality of sensitive wetlands.

My recommendations and assessment need to be consistent with public policy. Despite recommending that VicRoads complete its review of the Victorian Traffic Noise Reduction Policy (TNRP) in my assessment of the West Gate Tunnel project, the TNRP remains unchanged. Consequently, there is no clear policy basis that supports the assessment of noise on habitable levels above the ground floor. In absence of an updated TNRP, I agree with the IAC that strict application of VicRoads’ TNRP only requires ground level receivers to be considered, but recommend consideration also be given to the noise levels for multi-storey residences.

For this project, key impacts discussed in the following sections affect values including biodiversity, water, landscape and amenity. Some of the impacts such as fragmentation of habitat are difficult to quantify. Some are risk-related – that is, they arise with respect to events or impacts that are uncertain or indirect. My assessment is based on an integrated approach that acknowledges connections between impacts and values

and their management. This in turn supports a robust environmental management regime with statutory weight to ensure that impacts which cannot be avoided are managed within acceptable limits.

5.1 Transport efficiency, capacity and safety

Evaluation objective

To provide for an effective connection between the Mornington Peninsula Freeway and Dingley Bypass, to improve travel efficiency, road safety and network capacity, as well as improve amenity and local transport networks in the Aspendale/Dingley area.

Traffic and transport impacts are addressed in Chapter 8 and Appendix A of the EES and in Chapter 6 of the IAC Report. Three EPRs deal with traffic and transport matters, one of which is the subject of recommendations by the IAC.

Assessment context

The IAC identified several key issues raised by submitters in the context of traffic and transport, including:

- the accuracy of traffic modelling;
- the capacity of the project design to achieve project objectives;
- the impact of the project on surrounding roads;
- local access concerns, especially for Woodlands Industrial Estate; and
- shared user paths to provide pedestrian and cycling access in association with the project.

Other matters which require consideration in my view include:

- post construction traffic volume monitoring;
- other proposed changes to the project;
- preventing construction traffic from using Edithvale Road through the Edithvale Wetlands; and
- the assessment process for any future upgrade of the project.

I note references in the EES and the IAC Report to the history of the road reservation for the project, which has been identified in planning strategies and instruments over the past several decades. The planning history of the project, or at least of the concept of building a major roadway generally along the alignment proposed in the EES, is relevant to the assessment of the environmental effects of the project. It has influenced land use planning and other decisions which have contributed to the present environmental and urban context of the project. In turn, that development effectively constrains options for alternative alignments for the project.

Discussion

Traffic modelling

Having considered criticisms of the proponent’s use of, and outputs from, the Victorian Integrated Traffic Model (VITM), the IAC concluded that the model was fit for purpose and noted that its use for the project was similar to the approach taken for other major road projects in the state. I accept the IAC’s findings in this regard.

As VITM outputs are crucial to the selection and design of Victorian infrastructure projects to address congestion and other network issues and to inform environmental impact assessments, it is essential that the performance of the model is regularly tested to ensure it remains a suitable tool. Therefore, I recommend an additional EPR that requires the road operator to monitor and report on the performance of the road and nearby related components of the regional road network to provide a comparison to, and validation of, the VITM model predictions provided in the EES.

Capacity of the project design

The IAC found that the proposed freeway design was generally supported, including the key elements questioned in submissions (at grade intersection with Dingley Bypass, lack of north-facing ramps at Centre Dandenong Road and addition of north-facing ramps at Thames Promenade). The IAC recommended that a third lane in each direction be added to the freeway between the Thames Promenade and Springvale Road ramps. Design of the Lower Dandenong Road interchange relative to Woodlands Drive is discussed separately below.

The Mornington Peninsula Freeway currently terminates at Springvale Road with an at grade intersection including a left turn slip lane southbound into Springvale Road from the freeway. Under MRPV’s preferred configuration for the project, the extended freeway will terminate with an at-grade intersection including left turn slip lanes from the freeway at Dingley Bypass. According to the EES, in 2031 both the new freeway (between Centre Dandenong Road and the Dingley Bypass) and the Dingley Bypass itself are predicted to carry substantially higher traffic volumes than the Mornington Peninsula Freeway east of Springvale Road and Springvale Road itself were carrying in 2016.

A key driver for the project is the need to overcome congestion caused by the present poor performance of the Mornington Peninsula Freeway-Springvale Road intersection. I am satisfied that this performance can be enhanced by the project, both by converting the existing “T” junction to a full diamond interchange and by enabling traffic to and from destinations further to the north and west to use the extended freeway. However, considering expected higher traffic volumes in future, it is most important that the existing problem is not simply translocated to the Mordialloc Bypass Freeway-Dingley Bypass intersection.

I appreciate that in some respects the design for the proposed Mordialloc Bypass Freeway-Dingley Bypass intersection is an improvement on the current arrangement at the Mornington Peninsula Freeway-Springvale Road intersection. For example, it includes two slip lanes for the left-hand turn off the freeway instead of one. The conditions at the existing intersection are compounded by the substantial proportion of traffic which also turns at the nearby Springvale Road-Wells Road intersection, whereas more Mordialloc Bypass traffic can be expected to travel a longer distance on the Dingley Bypass, contributing to smoother traffic flow.

The rationale for the IAC’s recommended additional lane in each direction on the Mornington Peninsula Freeway between Thames Promenade and Springvale Road is not clear. While the new north-facing ramps at Thames Promenade can be expected to contribute to increased traffic loads on the freeway north of Thames Promenade, it would seem likely that most of the additional traffic would not enter or exit the freeway at Springvale Road. However, the additional lanes may provide more room for exiting traffic to cross over with entering traffic. I note that potential impacts of additional lanes on other environmental values have not been investigated through the EES process.

I consider that EPR T1 adequately articulates the required level of service endorsed by the IAC. That said, the decision about how to ensure delivery of the required level of service is a design issue best determined by the proponent.

Impact on surrounding roads

The project will redistribute traffic within the local network of arterial roads and may attract additional traffic. The purpose of the project is to alleviate existing and worsening congestion on parts of the network. Modelling presented in the EES forecasts that several roads presently under stress will carry substantially reduced volumes when the project opens.

Some sections of some roads will, however, carry increased traffic. The IAC accepted MRPV’s view that there is capacity on most of those roads to accommodate the predicted additional traffic volumes. The IAC

recommended that planned upgrades to Governor Road, Centre Dandenong Road and South Road, presented in Transport for Victoria’s submission, should be integrated with the project as the project would not deliver its objectives in their absence.

My assessment, here, cannot address the environmental effects of related road upgrades not incorporated into the project and therefore not investigated in the EES. Those projects may have impacts of their own that require consideration, investigation and mitigation through applicable assessment and approvals procedures. However, the point that the project should not be considered in isolation but as an integrated element of the broader network, is valid. MRPV should liaise closely with Transport for Victoria in determining the timing of project delivery relative to other planned or proposed works on the network. As noted above, modelling may be a helpful tool in shedding light on the implications and likely performance of different options for sequencing works.

Local access

The design of the project’s interchange with Lower Dandenong Road attracted objecting submissions from several businesses located in the Woodlands Industrial Estate. In response, MRPV prepared and eventually adopted an alternative interchange layout connecting the northbound exit ramp from the freeway to Woodlands Drive, and then via Woodlands Drive to Lower Dandenong Road. The revised configuration was supported by all objecting submitters and by Kingston City Council and endorsed by the IAC. It is my assessment that the alternative layout should be incorporated into the project, so long as any impacts, and their mitigation, are consistent with those presented in the EES.

Shared user paths

As with most recent freeway builds, the project includes provision for parallel shared use (cycling and pedestrian) paths. The paths are planned to cross intersecting roads at grade. Several variations to MRPV’s design were sought by submitters, including Kingston City Council. The IAC has provided discussion and conclusions about the suggested variations. It is my assessment that:

- an at-grade crossing of the Dingley Bypass is appropriate in the first instance;
- the case has not been made for requiring a shared path underpass at Chadwick Reserve;
- Kingston City Council’s suggested extension of the shared user path as a boardwalk at Bowen Parkway need not be a requirement at this time, but in the final design the principles associated with public accessibility and optimising scope for active transport in conjunction with the freeway should be given due regard;
- urban design principles should be implemented in the design of the shared user underpass at Braeside Park; and
- a safe shared use crossing on the Springvale Road north-east slip lane onto the Mornington Peninsula Freeway should be incorporated into the project design.

Edithvale Road construction traffic

Edithvale Road continues south-west from Springvale Road’s intersection with Wells Road. Between the Branagan Drive roundabout and Nepean Highway, it is a two-lane two-way arterial road that bisects the Edithvale portion of the Edithvale-Seaford Wetlands Ramsar site. A speed limit of 60km/h applies where it passes through the wetlands. Use of Edithvale Road may change in future, following delivery of the planned removal of the Edithvale Road level crossing adjacent to the Edithvale Road–Nepean Highway intersection.

EPRs B4 and T2 (as recommended by the IAC) propose the exclusion of heavy construction vehicles from Edithvale Road through the wetlands under the required Transport Management Plan (TMP). I agree that the project should not add heavy construction vehicles to the traffic in Edithvale Road as this could affect biodiversity values of the Ramsar site. At the same time, I recognise that the road is part of the arterial network and will carry some heavy vehicles irrespective of the project.

The challenge for MRPV will lie not so much in framing the TMP in appropriate terms as in enforcing the requirement with contractors and sub-contractors. MRPV will need to take active responsibility for informing all operators and personnel engaged on the project of the requirement and its rationale, and for monitoring and enforcing compliance with that element of the TMP. On that basis, and considering further discussion in Section 5.2 of this assessment, it is my assessment that the proposed approach for Edithvale Road is appropriate.

Future upgrades

The project presented in the EES is a dual carriageway freeway with two lanes in each direction, and impacts have been assessed with regard to that configuration. The EES foreshadowed that at some future time an additional lane might be added in each direction but the consideration of impacts in the EES did not address this possibility. Any future proposal to add lanes to the freeway should undertake an adequate assessment of environmental effects. Whether a formal referral under the EE Act should be submitted will be a matter for the proponent at that time. Therefore, it is my assessment that the incorporated document should specify that the project approved at this time is a freeway with two lanes in each direction, except for the possible widening of the existing Mornington Peninsula Freeway between Thames Promenade and Springvale Road.

Assessment

- The proposed level of service for the project is an appropriate performance measure and that subject to detailed recommendations of this assessment, the project can achieve the evaluation objective.
- While the traffic modelling undertaken for the EES is appropriate, I recommend an additional EPR for monitoring and reporting on project performance relative to benefits predicted by modelling presented in the EES. This will assist future road-project assessments.
- While the project should not be delivered in isolation from other planned changes to the transport network, this assessment does not endorse network upgrades not addressed in the EES.
- The revised configuration for the north-bound off-ramp at Lower Dandenong Road, connecting to Woodlands Drive, is supported, subject to appropriate quantification and management of any impacts which may be greater than those of the configuration presented in the EES.
- I generally support the IAC’s conclusions regarding shared use paths.
- The proposed exclusion from Edithvale Road of heavy construction vehicles for the project is supported, and MRPV should take a proactive role in ensuring that the exclusion is effectively communicated to the project team and is enforced.
- I have not assessed any future proposal to upgrade the Mordialloc Bypass freeway, whether by adding lanes or in other ways.

5.2 Biodiversity

Evaluation objective

To avoid, minimise or offset potential adverse effects on native vegetation, listed migratory and threatened species and communities, as well as habitat for other protected species.

Biodiversity impacts are addressed in Chapter 10 and Appendix C of the EES and in Chapter 8 of the IAC report. Chapter 22 of the EES and Chapter 21 of the IAC report address MNES, all of which relate to biodiversity values. Of the six EPRs that deal with biodiversity matters, five have been the subject of recommendations by the IAC.

Assessment context

Potential impacts to biodiversity values in and close to the project were key drivers for my decision that an EES was required for the project. They were also central to the Commonwealth decision that the project is a controlled action under the EPBC Act. The conclusions of my assessment that relate to MNES are further addressed in Appendix A.

The project traverses a highly modified, largely urban environment with degraded and fragmented natural values. Nevertheless, the area’s remaining habitat supports many species, including migratory birds and wetland birds listed as threatened under the Commonwealth EPBC Act and/or the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act).

As identified in the EES, Edithvale Wetlands (part of the Edithvale-Seaford Wetlands listed under the Ramsar Convention), Waterways Wetlands, Braeside Park Wetlands and Woodlands Industrial Estate Wetlands all provide important habitat for wetland birds. At least some of the birds are likely to move periodically or irregularly between those wetlands and other wetlands in the broader locality. While the wetlands are geographically discrete, they should be treated as interconnected for habitat purposes.

A broader context is essential for sufficiently understanding the project’s likely biodiversity effects and their acceptability. Although it is important, vegetation condition or integrity is not the sole contributor to wetland habitat quality. Water quality, flow regimes and availability of varied foraging substrates may also be critical to understanding the suitability of wetland habitat for different species

The following potential impact pathways on biodiversity values were addressed in the EES, submissions and the IAC report:

- direct loss or degradation of habitat, including artificially created or restored habitat;
- habitat quality reduction due to construction or operational impacts such as increased artificial light, noise, vibration, over-shadowing, changes in hydrology or diminished air quality;
- loss of connectivity between remaining habitat patches; and
- death or injury to wildlife due to collisions with vehicles on the new road.

Biodiversity values, near the project, were described in the EES with reference to database information and project-specific field investigations. As well as standard measures to avoid, minimise and offset impacts on biodiversity, MRPV proposed tailored mitigation approaches to mitigate impacts on connectivity and to reduce the risk of roadkill that might be caused by the new freeway. The freeway is proposed to bridge the Waterways Wetlands to reduce the construction footprint and to allow wildlife to move through the wetlands underneath the road.

Discussion

The IAC has encapsulated its findings on biodiversity matters in its recommended changes to biodiversity EPRs. The IAC drew the following conclusions:

- disturbance impacts on fauna during the construction phase will be short-term and temporary;
- removal of native vegetation to the extent proposed (approximately 12Ha) is not significant;
- project-induced changes to groundwater will cause negligible, if any, impacts on the Edithvale Wetlands;
- operational impacts on fauna are acceptable subject to upgraded mitigation measures reflected in the IAC’s recommended changes to EPRs; and
- a flora and fauna monitoring and management plan is supported, with a monitoring period of five years.

I am satisfied that consideration of impacts on listed species below and discussed in Appendix A effectively addresses the impacts on other protected wetland species.

Many Australian wetland birds and migratory species that visit Australia during their non-breeding season are adapted to occupy wetlands that present the best conditions. The birds will move as required when certain habitat areas become unsuitable or resources become available elsewhere. However, their capacity to move is not unlimited and will vary from species to species. It is likely that for most wetland bird species,

the potentially affected wetlands serve as components of a larger complex which also includes Seaford Wetlands and Melbourne Water’s Eastern Treatment Plant.

Construction impacts

Disturbance of resident, or migratory, fauna is inevitable where large-scale construction is undertaken near its habitat. The question is whether the residual impacts are acceptable in the context of proposed or required mitigation and management measures and the intended benefits of the project.

Fauna persisting in urban areas generally does so not only in response to suitable available habitat but also because it is sufficiently resilient to those disturbances associated with urban land use and development. I consider it likely that species which make use of habitat at modified or constructed wetlands adjacent to existing infrastructure and industrial activity are also likely to be resilient to the types of temporary effects unavoidably associated with construction of a project such as the Mordialloc Bypass.

However, it is incumbent on MRPV to minimise adverse effects arising from construction as far as practicable. For example, light spill from construction lighting should be effectively shielded from neighbouring habitat areas (as well as nearby residential areas) to avoid disturbing or disorienting wildlife, as proposed by MRPV in EPR B2. The approach taken should be based on a premise of enabling wildlife to continue to survive in and use adjacent habitat throughout the construction phase, rather than trusting that displaced wildlife will return once the disturbing activities have concluded. I therefore recommend that EPR B2 be amended to require MRPV and its contractors to adopt best practicable measures to avoid and minimise adverse impacts from construction on wildlife using habitat adjacent to the project.

Native vegetation

Twelve ecological vegetation classes (EVCs) were recorded within the project area, all of which are considered either ‘endangered’ or ‘vulnerable’ within the Gippsland Plain Bioregion (Table 3). The EES identifies a maximum extent of 10.56Ha of these EVCs to be cleared, although this increases to a total of 12.10Ha of native vegetation to be removed when considering scattered tree buffers.

Table 3: Predicted maximum loss of EVCs (EES, p. 10-35).

EVC	Maximum anticipated loss (Ha)
Aquatic Herbland	0.81
Creekline Grassy Woodland	0.22
Damp Sands Herb-rich Woodland	0.01
Plains Grassland – South Gippsland	0.05
Plains Grassy Wetland	4.53
Plains Grassy Woodland	2.02
Sedge Wetland	0.47
Swamp Scrub	0.53
Swampy Woodland	0.04
Tall Marsh	1.23
DELWP modelled wetland	0.64
Total	10.56

The bridge over Mordialloc Creek will result in the shading of native vegetation and habitat, including threatened vegetation communities (addressed further below). The EES treats all of this ‘shaded’ vegetation under and within 8m of the bridge as being lost or removed for the purposes of calculating vegetation losses and offsets.

The EES predicts that up to 294 remnant native canopy trees (as defined under 2017 DELWP Guidelines) will be impacted or lost, including both scattered trees and trees in patches (Table 4). If understorey trees are also included, the total impacted will be up to 331 remnant native trees. The number of large trees (as defined under 2017 DELWP Guidelines) to be impacted or cleared for the project will be 60 (both in patches and scattered). The predicted clearing will be subject to EPRs B3, B4 and B5, which includes using the detailed design process to find further opportunities to limit vegetation removal, which will also be incentivised in the design and construct contract. The EES states that retained trees will be protected by no-go zones.

Table 4: Predicted maximum impact on canopy trees (EES, p. 10-36).

Tree size	Number retained	Number removed or lost due to tree protection zone impacts	Total
Large	36	25	60
Small	373	270	643
Total	409	294	703

Native vegetation, whether remnant or restored, in an urban landscape, is a rare asset. For much of its length the project traverses or borders the South East Green Wedge, in which the Victorian and local governments have invested significantly. The conservation of biodiversity in the green wedges close to developed areas is an important aspect of this. In contrast to the IAC and in the context of the project’s location relative to the green wedge, I consider clearing 12Ha of native vegetation to be significant, warranting very careful examination to ensure that the loss has been minimised to the extent practicable and mitigated to an acceptable level.

Vegetation of the Waterways Wetlands will be affected by the project due to direct construction impacts and to overshadowing from the bridge structures. Much of the vegetation here has been planted as part of a sophisticated habitat recreation endeavour. This does not detract from its value or ecological integrity. It meets the definition of native vegetation for protection and offset purposes under Victoria’s native vegetation clearing controls¹. Anticipated indirect losses must be added to direct clearing losses for calculation of offsets.

I acknowledge that the potential native vegetation loss is presented in the EES as a maximum, likely to be further reduced through the design refinement process. While I trust that further design will endeavour to reduce the total area of native vegetation to be cleared, I expect that no losses of native vegetation comprising threatened communities or of large remnant trees, beyond those explicitly documented in the EES, will be considered acceptable in MRPV’s final design.

All actual losses of native vegetation, including native vegetation anticipated to be lost due from indirect impacts, should be offset in accordance with Victorian policy. Under the 2017 DELWP Guidelines, offsets must be secured before vegetation removal occurs. As far as possible, Victorian native vegetation offsets should be selected to meet any Commonwealth offset requirements under the EPBC Act (see also Appendix A).

Seasonal herbaceous wetland (freshwater) of the Victorian coastal plain

This wetland vegetation community is listed as Critically Endangered under the EPBC Act. It occurs in the Waterways Wetlands where it has been planted. Although not remnant vegetation, the community qualifies for listing and therefore offsetting under Commonwealth and Victorian policy settings. It largely corresponds with the Herb-rich Plains Grassy Wetland (West Gippsland) Community listed under the FFG Act.

¹ *Guidelines for the removal, destruction or lopping of native vegetation*, DELWP 2017.

The Waterways Wetlands will be traversed by dual bridges with a minimal construction footprint in the wetland. The EES predicts 0.24Ha of this EPBC listed vegetation community will be cleared or lost. Light penetration between the bridges will mitigate the over-shadowing effects of the structures on the vegetation but some impact is expected; over-shadowed vegetation is assumed to be lost for the purposes of accounting and offsets. I acknowledge that both direct and indirect impacts are to some extent unavoidable and am satisfied that the approach taken reflects an appropriate focus on protecting the vegetation as far as practicable.

Options for planting trees near the bridges were presented as a way of reducing the visual impact of the bridge structures, including their noise barriers. Trees are not consistent with the character of Seasonal Herbaceous Wetland (or of Natural Damp Grassland, discussed below). The integrity of the nationally threatened ecological communities should be prioritised in terms of minimising adverse impacts of the project as it traverses the Waterways Wetlands. If visual screening of the structures is needed, other locations should be selected for planting of trees or shrubs.

Natural damp grassland of the Victorian coastal plain

This wetland vegetation community, listed as Critically Endangered under the EPBC Act, occurs in the Waterways Wetlands where it has been planted. It too qualifies for listing and offsetting under Commonwealth and Victorian policy settings. Its extent only narrowly overlaps the footprint of the proposed dual bridges and is substantially less than the extent of impact on the Seasonal Herbaceous Wetland Community discussed above. Only 0.04Ha of this EPBC listed community is proposed to be cleared, which corresponds with the FFG Act listed Plains Grassland (South Gippsland) Community. However, MRPV should still work to retain and maintain the community as far as practicable through sensitive design and appropriate construction approaches and through operational management of the project.

Impacts on Edithvale Wetlands

Edithvale-Seaford Wetlands is listed as a wetland of international importance under the Ramsar Convention to which Australia is a signatory. It is therefore protected as an MNES under the EPBC Act. The Edithvale Wetlands lie within a kilometre of the southern end of the project. Potential impacts of the project on water quality and hydrology, including groundwater, and the associated risks to the ecology and habitat/vegetation of the wetlands were among the reasons I required an EES.

The EES concluded that impacts on groundwater flows resulting from the project would be negligible and would have minimal if any effects on the wetlands. Groundwater modelling undertaken for the EES predicted the worst case generating a potential maximum 2% change, expected only in the short term. The IAC accepted that conclusion and I am satisfied that the overall implications for vegetation from potential impact on groundwater is negligible.

Changes to surface water flows could increase the regime of inflows to Edithvale Wetlands. The EES predicts this is likely to result due to the increased proportion of impervious areas, with both the surface area and depth of these wetlands likely to increase at times, particularly during dryer periods when the wetlands levels are already below average. This is discussed in detail in Section 5.3, where a modified EPR is recommended to stipulate that the hydrological characteristics of the Edithvale Wetlands are maintained. I am satisfied that the implications for habitat and biodiversity in the Edithvale Wetlands can be managed through the implementation of EPRs.

Significant bird species, particularly Australasian Bittern, Sharp-tailed Sandpiper, Curlew Sandpiper and Latham’s Snipe, occurring at Edithvale Wetlands also occur with varying frequency and in varying numbers at the other wetlands adjacent to the project and at other wetlands in the broader locality. Such species are generally mobile, some being trans-equatorial migrants, so they are expected to make use of different sites within a broader wetland complex as conditions vary, especially seasonal water level changes.

Among the species either known to occur or potentially occurring in the wetlands that could be affected by the project are several species of state and national conservation significance. They include species listed as threatened or as migratory or both under the EPBC Act, which were explicitly identified in the scoping requirements for the EES. The EES also considered several other listed species in Chapter 22 on MNES but concluded that impacts would be negligible.

Impacts on wetland birds and other fauna habitats

In addition to birds, the surrounding wetlands support a range of other fauna. The EES identified 210 vertebrate fauna species having been recorded within or adjacent to the project area, including frogs, turtles, mammals and six native fish species. The project will result in some habitat loss and fragmentation, which will affect fauna movements in the area. The road infrastructure itself (and use by traffic) can form a physical barrier or influence on movement for some species, particularly those sensitive to the light, noise and other traffic related disturbances. MRPV propose to minimise the direct and indirect impacts on fauna through EPR B1. This include design elements such as fauna connectivity culverts and multi-function fauna barriers (MFFBs) to reduce behavioural impacts and mortality in key habitat areas.

The EES proposes the provision of a minimum of two fauna culverts to address the passage of fauna between the Waterways Wetlands and other waterbodies such as the Woodlands Industrial Estate Wetlands, as well as a minimum of three culverts for habitats between Braeside Park and the Woodlands Industrial Estate Wetlands. All MNES species are also of conservation concern in Victoria, most being listed as threatened under the FFG Act. So, while each of the relevant nationally significant species is addressed in more detail in Appendix A, a consolidated treatment of these biodiversity matters is provided below.

The project could impact on wetland birds by:

- affecting the hydrology of wetland habitats (examined above);
- diminishing habitat quality or suitability, for example through light spill, noise or other sources of disturbance;
- reducing effective connectivity between wetland patches; or
- direct impacts such as roadkill.

Those potential impacts could affect the full guild of wetland birds, not only nationally listed species.

MRPV proposed mitigation measures to address the potential impacts on birds utilising wetlands in and around the project area and concluded in the EES that residual impacts would be minor or insignificant.

Proposed mitigation measures include:

- minimising changes to run-off patterns and flooding levels resulting from the project;
- reducing light spill from the construction and operational phases;
- installing fauna-friendly culverts to enable fauna to move at ground level between habitat patches separated by the road;
- installing MFFBs to encourage flying birds to traverse the new road above collision risk height (while also reducing noise and light impacts on habitat adjacent to the road); and
- avoiding using Edithvale Road through the Edithvale Wetlands for heavy construction traffic.

It is not possible to determine how effective each of these measures is likely to be in isolation. However, as a program of measures I am satisfied that this package could mitigate potential impacts on listed protected wetland birds to acceptable levels. Design of MFFBs should seek to reconcile biodiversity benefits with landscape and visual impacts. I recommend considering planting dense stands of suitable locally indigenous shrubs close to MFFBs both to screen the structures from view and to encourage birds to fly higher across the road.

I consider it uncertain if not improbable that significant wetland bird species will choose to walk through long culverts rather than fly between wetlands to be separated by the project, even if suitable habitat is at both

ends of the culvert. However, other native wildlife occurring near the project (such as at Braeside Park) might do so, provided the design and maintenance of the culverts is appropriate. It will be important that culvert design and maintenance, including the approaches at either end of each culvert, is correctly aligned with the needs and behaviour of any of the species being targeted to potentially make use of them. Adequate monitoring of use of the culverts will also be essential to enable adaptive management changes to be made if required.

Many other protected species such as waterfowl and cormorants make more use of deeper water than the shorebirds and wading birds discussed individually in Appendix A. While water quality will be important for habitat maintenance for wading birds, it might be even more important for species which routinely forage in the water column and rest on the water.

There is the potential for water quality in receiving environments to be affected by the project during operation and construction, because of increased sediment load and other contaminants associated with runoff from roads. There is also the risk of spills from vehicles during the freeway’s operation. In addition, it will be necessary to slow and attenuate increased run-off from the project’s impervious surfaces south of Springvale Road into the Edithvale Wetlands. However, I am satisfied that the potential impacts of the project on water quality can be satisfactorily mitigated through the proposed use of grassed swales, as well as bioretention systems, spill containment measures and retention structures in key areas to protect sensitive receptors (see also Section 5.3). Providing EPRs are refined and implemented consistent with the findings of my assessment, the risks to water quality of receiving environments, including wetlands, should be acceptable.

Noise and other disturbance impacts (post-construction)

An increase to ambient noise levels has the potential to impact on wildlife species that use calls. Calls may be relevant to particular behaviours, may be audible over different distances and may be given at different times of day or night according to purpose and habits. If an increase in ambient noise leads to calls being less effective for their behavioural purpose, impacts on species’ breeding success or survival rates might result.

While species surviving in urban environments are necessarily adapted to a modified environment, a step change in ambient noise conditions in certain localities, especially the Waterways and Braeside Park Wetlands, will result from the project. For land use purposes, those areas do not qualify for noise mitigation under the TNRP (see Section 5.4).

However, the proposed MFFBs will achieve a degree of noise reduction in areas adjacent to the road alignment. Design of the MFFBs should pursue an appropriate balance between secondary benefits such as noise attenuation and possible adverse visual impacts, without losing sight of the priority purpose of protecting wildlife from vehicle collisions.

Lights are also of concern, especially for birds as lights can disorient travelling birds. Lights can also attract insects on which some bird species feed, causing birds to concentrate in areas where they may be at greater risk of injury. Effective shielding of lighting used for construction will be critical, especially near wetlands. Operational lighting for the freeway should also be shielded from overspill into adjacent areas that provide fauna habitat.

Flora and fauna monitoring and management plan

EPR B6 would require a flora and fauna monitoring and management plan to be prepared and implemented. I support this requirement in principle. The IAC has accepted MRPV’s argument that monitoring should be required only for five years after the road opens. I consider it is too early to determine whether five years is an adequate period. Initial provision should be made for a longer period of monitoring, with scope for the

period to be reduced if results demonstrate that it is appropriate and agreed by DELWP. For example, if monitoring data show that flora and fauna values have stabilised, usage of project components such as fauna underpasses is following consistent patterns and adverse impacts such as road kill have been effectively minimised, further monitoring may add little value. It will be important that monitoring effort, intensity and duration is adequate to demonstrate the extent to which actual project impacts align with those expected.

Further to this, effective monitoring and contingency planning is needed to enable adaptive management. Contingency plans should be prepared ahead of the commencement of works near wetland habitats, to enable prompt responses to any monitoring data showing that flora and fauna values are still at risk despite the application of mitigation measures recommended in the EES.

Assessment

- The project can be constructed and operated with acceptable impacts on biodiversity values, subject to implementation of the detailed recommendation of the IAC endorsed and/or refined through this assessment.
- All protected fauna will benefit from mitigation measures for threatened species.
- Impacts on the habitat values of the Edithvale Wetlands are considered acceptable subject to mitigation measures identified in this assessment.
- Noise and light spill impacts of the construction and operational phases of the project on fauna using adjacent habitat should be reduced as far as practicable.
- The implementation of MFFBs and fauna underpass culverts is supported, subject to detailed design and management to optimise their effectiveness in reducing project impacts on fauna.
- Impacts on the nationally threatened wetland vegetation communities at the Waterways Wetlands are considered acceptable provided proposed mitigation measures are taken and the ecological integrity of the communities is prioritised over mitigation measures for other values in managing the area directly occupied by those communities.
- Impacts on native vegetation within the range described in the EES are significant but acceptable. Every effort to minimise actual losses of native vegetation through detailed design and construction should be made. Additional losses beyond those described in the EES are not endorsed by this assessment and are not considered acceptable.
- The proposed flora and fauna monitoring and management plan is endorsed with an extended initial period subject to monitored impacts stabilising at acceptable levels in line with expectations based on the EES.
- In general, I support the EPRs recommended by the IAC, with some qualifications set out within this assessment.

5.3 Water, catchment values and hydrology

Evaluation objective

To minimise adverse effects on groundwater, surface water and floodplain environments and flooding levels, as well as minimise effects on water quality and beneficial uses of downstream environments, including the Edithvale-Seaford Ramsar site.

The EES (Chapters 16 and 17) included a description of the existing conditions and assessment of potential water related effects. Two technical assessments (Appendix J – Surface Water Impact Assessment Report and Appendix K – Groundwater Impact Assessment Report) were included within the EES documentation to support the conclusions of the EES. MPRV proposed six EPRs to manage water impacts. The IAC recommended changes to four of those EPRs and recommended a new EPR.

Assessment context

The key water related issues that the EES needed to consider in the context of my EES decision as well as applicable policy and legislation were the potential changes to, or effects on:

- flooding due to the project in its locality;
- waterways and their beneficial uses due to the interception or diversion of flows or changed flow regimes, during construction and operation;
- waterways and beneficial uses due to changes in water quality during construction and operation;
- downstream wetland environments (Braeside West and Mordialloc Creek Wetlands, Waterways Wetlands, Woodlands Industrial Estate Wetlands and Edithvale-Seaford Wetlands), due to changed flows and/or water quality changes during construction and operation; and
- groundwater and associated discharge areas, such as the Edithvale-Seaford Wetlands.

The proposed freeway crosses and in places intercepts overland flow paths, drainage channels and associated drainage schemes, all within a low-lying flood prone area. The project will construct large impervious surfaces that will discharge stormwater runoff at various points, including into the Woodlands Industrial Estate Wetlands and the Edithvale Wetlands. All stormwater runoff from the project area will ultimately end up draining to either Edithvale Wetlands or Port Phillip Bay via Mordialloc Creek.

Discussion

Flooding

As described in the EES, construction of the freeway will see infrastructure on the floodplain with new embankments, bridges, widening of existing roads and with new culverts and underground drainage. All of these will result in changes to surface water drainage and flooding behaviour in the surrounding areas.

Construction also has the potential to adversely affect flooding due to the temporary presence of works (such as access tracks, piling platforms, stockpiles, etc.) in the floodplain storage areas and within the extent of the 1% annual exceedance probability (AEP), causing diversions and restrictions of flow as well as reduction in storage capacity. While these changes are temporary, they have the potential to worsen flooding in the surrounding or downstream areas.

As documented in the EES, modelling of the reference design (incorporating proposed drainage elements such as culverts, pipes and swales) was undertaken to assess flood levels and extents, using a range of design-floods (20%, 5% and 1% AEP), although only the largest flood (1% AEP) was presented in the EES. The conclusion of the EES was that the reference design mostly meets the requirements of Melbourne Water² for infrastructure in flood-prone areas, except for the following three locations outside the project area with significant afflux (increase in flood level) in the 1% AEP design flood:

- immediately south of Lower Dandenong Road (up to 0.5m afflux);
- Braeside Park and Woodlands Industrial Estate Wetlands area (up to 0.05m afflux over a wide area); and
- east of Bowen Parkway (up to 0.06m afflux).

2. The key Melbourne Water principles and standards for infrastructure projects in flood-prone areas include:

- risk to people and property must not increase as a result of the development;
- works or structures should not affect floodwater flow capacity;
- works or structures should not reduce floodwater storage capacity;
- works or structures should not create new hazards or increase existing hazard;
- works or structures should not reduce minimum freeboard; and
- climate change must be considered in the design.

MRPV has indicated it will resolve the afflux immediately south of Lower Dandenong Road using measures within the final detailed design. However, it does not propose any further mitigation for the other two potentially affected areas.

Subsequent to the exhibition of the EES, MRPV undertook further assessment of the impacts of the project on the extent of floodwaters under a climate change scenario (based on DEWLP guidelines³). This predicted increased flooding in three additional areas for the 1% AEP:

- south of Centre Dandenong Road (up to 0.22m afflux), impacting seven properties;
- north of Lower Dandenong Road (up to 0.11m afflux) impacting three properties; and
- Braeside (up to 0.015 to 0.027m afflux) impacting up to 50 properties, and 0.045m afflux at the Parks Victoria office.

MRPV advised that mitigation measures could be incorporated into the detailed design to address these areas, although it may not fully eliminate the small predicted increases in afflux for properties in the Braeside area.

MRPV has been engaging with Melbourne Water since the exhibition of the EES to examine design options to address all the flooding requirements for infrastructure in flood-prone areas. Melbourne Water’s submission to the IAC confirmed this work with MRPV is progressing well and that the potential flood impacts of the project should be resolved through the detailed design process (including those identified by the post-EES climate change scenario modelling).

The IAC noted that MRPV is not planning to address widespread flood afflux in Braeside Park given that they consider it unlikely to alter flood risk for people or property. When examined further at the hearing MRPV advised that the predicted afflux is unlikely to have significant ecological impacts (see also Section 5.2).

Several submitters raised concerns about the flooding risks and considered that further examination was needed to understand and mitigate these risks. Kingston City Council requested a specific requirement for MRPV to mitigate flood afflux at specific locations. The IAC concluded that MRPV’s approach to meeting Melbourne Water’s general requirements through detailed design was sufficient assurance that a satisfactory outcome would be reached on minimising flood impacts, including any that may arise during the detailed design process. I concur with this and expect Melbourne Water’s application of its performance criteria during the detailed design phase of the project will enable MRPV to resolve these flooding matters.

Kingston City Council also raised concerns about MRPV’s reliance on lateral drainage culverts to convey floodwaters across the project area, citing the potential for catastrophic flooding if there were a blockage or a flood larger than can be accommodated by the project design. The IAC supported Council’s request for the detailed design process to ensure relevant drainage and flooding variables are examined to address this and recommended that EPR W2 be amended to explicitly require this. The IAC also accepted Council’s recommendation for ongoing monitoring and maintenance of the culverts to prevent blockage rather than relying upon the five years proposed by MRPV. I support the IAC’s conclusions.

The IAC agreed with the conclusion presented in the EES that the construction of the project is likely to worsen flooding temporarily but not to a significant extent, particularly given the proposed environmental management required through EPRs and Melbourne Water principles and standards, as set out in within the EES. Indeed, Melbourne Water confirmed to the IAC that it will consult with MRPV to help ensure appropriate measures are adopted and impacts are minimised to acceptable levels during construction. This includes requiring a hydraulic assessment and a flood response plan to be prepared to Melbourne Water’s satisfaction before works can commence. I am satisfied this will address construction related flooding risks.

³ *Guidelines for Assessing the Impact of Climate Change on Water Supplies in Victoria* (DELWP, 2016)

Surface hydrology and flow regimes of receiving waters

The EES notes that the project will increase impervious areas and will alter the stormwater runoff rate and volume entering downstream waterways. Altering runoff in this way has the potential to impact on the downstream water environments. The impact was assessed in the EES through the simulation of daily flows for the reference design (i.e. using the MUSIC⁴ model for both the 1952–1961 and 1975–2017 periods) at the Dunlops Drain gauging station in the Mordialloc Creek catchment and for inflows to the Woodlands Industrial Estate Wetlands. This in turn provided an assessment of the potential impacts on the overall flow regime of receiving waterways.

The EES predicted there are likely to be negligible changes in the flow duration curves for Mordialloc Creek and the Woodlands Industrial Estate Wetlands, and therefore negligible impact on the hydrology of downstream water environments. The EES also considered impacts in the context of the changes likely to occur due to climate change. This helped support the conclusion that flow regime impacts from the project on the Mordialloc Creek Catchment and Port Phillip Bay are very negligible in the broader context.

The EES also concluded the Waterways Wetlands will have a negligible proportion of its catchment and inflows impacted by the project (less than 1% of the total inflow), so there will be no perceptible impact on its inflow regime. However, the construction of the bridges using piles located between two wetland cells does have the potential to influence the internal wetland hydrology, although with appropriate design and construction management this should only be a short-term disruption and have negligible impacts beyond that.

The IAC accepted that the project will not significantly change the flow regime of Mordialloc Creek or inflows to the Woodlands Industrial Estate or Waterways Wetlands and noted that the Braeside Park Wetlands are upstream of the project area.

There were no specific submissions identified by the IAC in relation to changes to surface hydrology or flow regime (other than flooding afflux), except the Defenders of the South East Green Wedge submitting that the hydrology of the Edithvale-Seaford Wetlands should not be altered by the project.

The EES presented results from a water balance model to assess impacts on the hydrology of the Edithvale Wetlands from increased surface runoff together with very small changes in groundwater inflow. The model used data from a nine-year period (2008-17) of rainfall-runoff to predict changes to the wetted surface areas of the wetlands under existing climate conditions. While the project footprint falls within only the southern wetland’s catchment, the hydraulic connectivity between the southern and northern wetlands enables changes occurring across both wetlands. The model results showed the project is expected to increase wetted areas within both wetlands, more so when run-off events occur during dry periods when the wetland levels are well below average. The EES identified the 80th percentile⁵ of the predicted increases in wetted area to be approximately 7% for the northern wetland and 5% for the southern wetland. The 50th percentile of predicted changes in wetted area were 2.8% (northern wetland) and 1.7% (southern wetland) respectively. The EES concludes those potential impacts would not be significant from a hydrological perspective given they often occur in the beginning of a wet event and are well within natural variation.

Should the project include additional lanes on the Mornington Peninsula Freeway within the southern wetland catchment, as the IAC recommended, the increase in 80th percentile of water surface area rises to approximately 10.5% in northern wetlands and 7.5% in the southern wetland.

⁴ MUSIC: Model for Urban Stormwater Conceptualisation

⁵ 80th percentile – this means that 80% of the predicted values are below this value; 50th percentile – this means that 50% of the predicted values are below this value.

The EES modelling also predicted negligible increases in water levels for current climate conditions, except in northern wetland cells EN2 and EN3. Their water levels are predicted to increase by 0.4 and 0.2m respectively (i.e. the 80th percentile of the predicted changes). However, impacts on these water levels are predicted to be very minor when considering the 50th percentiles of the predictions (i.e. less than 5cm for EN2 and negligible for EN3).

MRPV’s proposed EPR W1 includes requirements to minimise impacts on surface water flow, including water flows to adjacent wetlands. The IAC proposed the deletion of the qualifier ‘adjacent’ in this EPR given the Edithvale Wetlands are not directly adjacent; this EPR requirement is important for the detailed design of outflows from the project area to the Edithvale Wetlands.

The modelling used for the EES clearly identifies the potential for changes to the hydrology of the Edithvale Wetlands, which could be significant at dryer times particularly with the additional (auxiliary) lanes now proposed in this part of the project area. This risk will need to be further controlled, monitored and reduced through the detailed design and implementation of the project EMF, given the significant ecological values of this EPBC listed wetland. I concur with the proposed change to EPR W1 to require minimisation of changes in water flows to wetlands. This EPR should also specify that hydrological characteristics of the Edithvale Wetlands are maintained to within acceptable limits, to minimise risk to its ecological values. Mitigation measures should include the provision of adequate on reservation retention capacity for stormwater from the impervious surfaces associated with the freeway, so that resultant increases in water entering the Edithvale Wetlands are appropriately reduced and attenuated.

Water quality

There is potential for water quality in receiving environments to be affected by the project during operation and construction, as a result of increased sediment load and other contaminants associated with runoff from roads. There is also the risk of spills from vehicles during the freeway’s operation.

The EES notes that historical water quality data in the project area (i.e. for 1994–2017 in Mordialloc Creek at Wells Road) is generally non-compliant with State Environment Protection Policy (SEPP) objectives (i.e. for most indicators) although this has improved since 2000. The EES reported on modelling (MUSIC) used by MRPV to examine the impacts of pollutant loadings from the project on surface water quality. The modelling was interpreted to show that the impacts of the project on surface runoff quality can be largely mitigated by using grassed swales and bioretention systems at specific outfalls (see below). These measures are currently incorporated in the road design.

The predicted pollutant loads are not likely to meet all water sensitive road design (WSRD) targets in the Best Practice Environmental Management Guidelines (BPEMG) for urban stormwater at outfalls at Lower Dandenong Road and Centre Dandenong Road. Both discharge into Melbourne Water’s drainage network and then Mordialloc Creek. The impact is quite localised and not significant, particularly given it is a very low proportion (3%) of the catchment of the project affected areas.

MUSIC modelling was also used in the EES to predict annual pollutant loads from the project area to the Edithvale, Woodlands and Waterways Wetlands. It predicted that pollutant loads would be increased compared to existing conditions if only grassed swales were used to mitigate effects. To reduce pollutant loads, in the EES MRPV proposed the use of bioretention systems at three of the five outfalls that drain to the wetlands (i.e. the Edithvale, Woodlands Industrial Estate and Waterways Wetlands). The sizes of the proposed bioretention systems is based on MUSIC modelling results. The bioretention systems would be implemented in addition to the swales in the proposed drainage design. The EES modelling shows that this proposed combination of mitigation measures would improve water quality entering the three wetlands downstream from the project compared to existing water quality conditions. Ecological impacts from water quality aspects of the project are anticipated to be insignificant.

The modelling was also undertaken for 2065 climate change scenarios which showed effectiveness of proposed treatment approach would be reduced but water quality would still meet the WSRD targets overall.

Successful mitigation of operational impacts on water quality in sensitive receiving environments is very much reliant upon the bioretention systems being monitored and maintained (including periodic resetting). The IAC raised concerns with the finite monitoring period proposed in EPR W5 and concluded that monitoring and maintenance of the bioretention systems should be ongoing. The IAC recommended that this be explicitly addressed through a Water Asset Management Plan (Operation) (IAC’s new EPR W7), to reduce uncertainty associated with long term effectiveness. I support this conclusion.

The IAC accepted Kingston City Council’s submission that EPR W1 should be amended to help ensure minimisation of changes in water quality to adjacent and receiving wetlands. The council also recommended wording that requires minimisation of ‘adverse’ changes in water quality, given that existing water quality in the project area is already poor. Melbourne Water was satisfied that the project will be able to meet or exceed water quality obligations using swales and bio-retention systems as proposed in the EES.

As proposed, EPR W1 would require minimisation of changes in water quality in adjacent wetland areas during design and operation, but not construction. It would also require avoiding increased pollutant loadings on beneficial uses (not limited to wetland areas) during construction but not during operation. The IAC recommended that EPR W1 apply across both construction and operation. I support this recommendation.

The project will increase traffic in the project area and increase the risk of fuel and chemicals spills from traffic accidents and firefighting. The importance of spill containment measures for protecting the ecological health of downstream environments was highlighted during the inquiry hearing. Concerns were also raised about the inadequacy of the proposed measures.

The EES included a spill risk assessment. It assessed the risks for each drainage outfall based on the likelihood of an accident and the proximity of the outlet to a receiving waterway or sensitive receptor. The risk assessment outcomes were that four of the five outlets draining to the Edithvale, Waterways and Woodlands Industrial Estate Wetlands were high risk. The fifth outlet that drains to the Woodlands Industrial Estate Wetlands was assessed as a moderate risk.

Spill containment structures are proposed in the EES, with a minimum capacity of 20,000L. This was determined using the capacity of a fully loaded fuel tanker. The proposed containment measures are to be located at the four high risk outfalls. MRPV indicated there is also potential for these mitigation features to be integrated into the design of the bioretention systems.

Several submissions questioned the adequacy of the mitigation measures, including whether the Austroads Guide to Road Design (Section 3.4.3 Spill Management) was used in the development of the proposed measures. It was submitted that EPR W1 should specifically require 40,000L spill containment capacity, given there is the potential for B-double and Higher Mass Load trucks to use the freeway. The IAC considered it reasonable to require that spill containment measures comply with relevant industry standards (i.e. 40,000L) and recommend this be reflected in the requirements of EPR W1. I support this recommendation.

Kingston City Council submitted that the extent of monitoring for the Water Management and Monitoring Plan required in EPR W5 should be ten years rather than five, given the time that may be required for ecological changes to occur and be detected. The IAC considered that monitoring should continue until enough data is collected to clearly confirm the effectiveness of management measures. The IAC was of the view that five years was typically sufficient.

I am satisfied that the potential impacts of the project on water quality can be mitigated to a satisfactory degree through extensive use of grassed swales together with bioretention systems and spill containment measures, providing EPRs are refined and implemented consistent with the findings of this assessment.

Groundwater

The EES notes that there will be short-term compaction of the local aquifer matrix by the embankments at the southern end of the alignment (both near Springvale Road and at Governor Road), causing a temporary rise in groundwater levels at these embankments. The modelling for all scenarios predicted very localised rises in groundwater levels, largely beneath the embankments themselves, with negligible changes predicted beyond the immediate area. MRPV consider this to be readily mitigated by the design as well as existing drainage, allowing the groundwater mounding to dissipate over a short timeframe. Hence, the road embankments are unlikely to have a significant impact on groundwater conditions, although monitoring will be undertaken to confirm this. The IAC recommended EPR W5 be amended to require monitoring of groundwater impacts, which I support. I concur with the findings of the EES and IAC. Similarly, the construction of the foundations for bridge structures over the Waterways Wetlands will involve piling, which has the potential to impact on groundwater. The EES concludes that impacts from the individual piles (spaced at 25m, to a depth of approximately 50m) are not likely.

Groundwater modelling undertaken for the EES concluded that impacts on the groundwater regime and its influence on the Edithvale Wetland are very likely to be negligible. The predicted difference between the base case and the potential worst case was insignificant, with only extreme rainfall events generating a detectable difference (approximately 2% change in inflow).

Assessment

- The impacts of the project on flooding, groundwater and surface water can be resolved through design and implementation of EPRs (subject to changes recommended in my assessment).
- There remain small impacts predicted from the construction and operation of the project on flooding in some specific areas during larger flood events (e.g. 1% AEP), which I am satisfied can be addressed by further design.
- EPR W2 also needs to be amended by inserting a requirement for the project design to minimise the risk of catastrophic flooding in the event of a flood larger than the 1% AEP design flood or blockage of project drainage features.
- The IAC's recommended new EPR (W7) will ensure the maintenance and performance-monitoring of drainage assets such as culverts is continued, which should be for a period longer than five years or as determined by MRPV in consultation with VicRoads, Melbourne Water and Kingston City Council.
- The project is not expected to alter the flow regime of Mordialloc Creek or inflows to the Woodlands or Waterways Wetlands significantly. The Braeside Park Wetlands are predicted to be affected by minor flood afflux but this is not expected to have any significant hydrological implications.
- The predicted changes to the water level regime of the Edithvale Wetlands could be significant if not further reduced. Hence, EPR W1 should be amended to require minimisation of changes in water flows to all wetland areas. I recommend the design of surface water control measures for the project should be in consultation with Melbourne Water as the manager of the Edithvale Wetlands Ramsar site.
- EPR W1 should also specifically require that hydrological characteristics of the Edithvale Wetlands are maintained to within acceptable limits, such that risks to protected ecological values are minimised. Mitigation measures should include providing adequate retention capacity for stormwater from the new impervious surfaces associated with the freeway so that resultant increases in water level at the Edithvale Wetlands are appropriately slowed and attenuated.
- The construction of project infrastructure within the Waterways Wetlands, between wetland cells, could potentially change the internal wetland hydrology, although this should be negligible and

readily addressed through appropriate design measures encompassed in EPR W1. However, EPR W1 should be amended to include an additional requirement to minimise changes to internal water flows within downstream wetlands.

- The potential impacts of the project on water quality can be mitigated to a satisfactory degree through extensive use of grassed swales, together with bioretention systems in key areas to protect sensitive receiving wetland environments, providing they have an appropriate monitoring and maintenance regime.
- The potential impacts of the project on water quality from spills can be addressed through appropriate containment measures, with the recommended refinements to EPRs. EPR W1 should be amended to clarify that 'adverse' changes in water quality to wetlands must be minimised. The proposed bioretention systems need to be included in the Water Asset Management Plan (operation) (EPR W7), with a requirement for ongoing monitoring and maintenance. EPR W1 needs to be amended to require that spill containment measures comply with relevant guidelines and standards.
- There are likely to be insignificant localised changes to groundwater levels, largely confined to areas beneath the road embankments and with negligible changes beyond that, although further design measures and monitoring are necessary to help ensure potential impacts are no greater than predicted.
- Effects of potential changes to local groundwater will have insignificant hydrological and hydraulic effect on the Edithvale Wetlands.
- Assuming successful implementation of the associated design and mitigation measures I concur with the IAC’s conclusion that the project is unlikely to have unacceptable impacts on groundwater, surface water or the downstream water environments.

5.4 Noise and vibration

Evaluation objective

To minimise adverse noise and vibration effects on nearby residents and land uses, having regard to relevant limits, targets or standards.

Noise and vibration impacts are addressed in Chapters 10 and 12 of the EES, which were informed by Appendices C and E as well as Attachment III of the EES. Chapter 10 of the IAC report considered the impacts and submissions made on these matters. I am generally satisfied that the noise and vibration impact of the project have been accurately assessed as part of the EES. Three EPRs deal with noise and vibration, of which one has been subject to recommendations by the IAC.

Assessment context

The project will have noise and vibration impacts through both construction and operational phases as summarised below. Noise and vibration impacts can affect the amenity of receptors and can also contribute to public health consequences. The existing land uses adjacent to the project include residential, industrial and public open space. These uses vary in their sensitivity to noise impacts. There is also potential for noise impacts to adversely affect fauna, including nationally protected bird species (see Section 5.2, Appendix A). The IAC identified several uncertainties relevant to the assessment of noise and vibration impacts in this case:

- no applicable statutory daytime construction noise limits;
- no clear thresholds of acceptability for impacts of noise on avifauna; and
- no quantification of operational noise impacts on the upper floors of multi-storey buildings.

Discussion

Existing conditions surrounding the roadway are consistent with those near other arterial roads threaded through urban and semi-urban areas of Melbourne. Current ambient noise conditions in residential areas near the project vary from 49dB(A) $L_{10,18hr}$ to 60dB(A) $L_{10,18hr}$. These levels are dependent on whether properties are on busy roads, suburban side-streets, or adjacent to public open space.

Industrial and commercial properties, adjacent to the alignment, were not considered sensitive receptors in the EES, in line with the TNRP. Non-residential properties covered by the TNRP are noise-sensitive community buildings such as schools, kindergartens or libraries.

The IAC noted that only one submission raised concern about noise effects to industrial receivers. However, no expert witnesses nominated industrial receivers as requiring noise attenuation. The IAC concluded that the EES used appropriate definitions of sensitive receivers and is consistent with the current TNRP. I support this finding of the IAC.

A note on VicRoads’ Traffic Noise Reduction Policy

Despite a minor amendment in 2005, the TNRP remains effectively unchanged since 1989. Recent inquiries (e.g. the West Gate Tunnel IAC) noted several aspects of the TNRP that are outdated or inconsistent with other Victorian noise policy standards and argued the TNRP does not represent best practice in comparison to interstate traffic noise policies. I agree and assert that it would be desirable for the review that commenced in 2015 to be completed as soon as practicable. I believe a new policy should establish a Victorian policy framework in line with current understanding of the health and economic impacts of traffic noise and community expectations.

Construction noise and vibration

Construction noise and vibration is proposed to be controlled through EPR NV2. EPR NV2 cites EPA Publication 1254, which suggests guideline standards for noise from construction works. It does not specify a quantitative standard for normal working hours but does provide quantifiable standards for evening and night-time.

The IAC expressed concern that EPR NV2 lacked sufficient consideration of construction noise from daytime activities. It recommended the inclusion of specific noise targets within a Construction Noise and Vibration Management Plan (CNVMP) to assist in managing and mitigating potential impacts. I note the approved EPRs NV6 and NV21 for the Melbourne Metro Tunnel project set out daytime construction noise management levels to trigger initiation of management actions.

The IAC heard various submissions concerning the appropriate content of the CNVMP. Kingston City Council’s expert witness, Mr Leo, recommended including noise and vibration targets similar to targets recommended in the West Gate Tunnel Project. MRPV considered that the proposed targets were unnecessary due to the variation in project and construction intensity. However, the IAC stated: *“noise targets are independent of the type of project or construction methodology. The purpose of appropriate noise targets is to protect the community from unreasonable noise. The means and ease by which the limits are achieved will be affected by the intensity of construction and machinery used”*.

I agree with the IAC about the need for quantitative targets for both daytime and night-time works. I also note that other recent major infrastructure projects are utilising the more explicit guidance provided by the New South Wales Roads and Maritime Services - Construction Noise and Vibration Guideline 2016, as representative of best practice within the industry given the age of the existing Victorian EPA publications 480 (1996) and 1254 (2008).

I am satisfied that the preparation of a CNVMP on these terms will ensure that noise and vibration impacts during construction will be appropriately mitigated and managed. The CNVMP should be prepared in consultation with the EPA.

Operational noise impacts in residential areas (road traffic)

The EES assesses future operational noise using project objective noise limits (PONLs), based on an interpretation of VicRoads’ TNRP and Road Design Note (06-01). The EES adopted PONLs are:

- 63dB(A) $L_{10,18\text{hour}}$ for sensitive receivers of noise from the Mordialloc Bypass; and
- 68dB(A) $L_{10,18\text{hour}}$ for sensitive receivers of noise that currently experience elevated ambient noise levels from the existing Mornington Peninsula Freeway.

During the IAC hearing, it was argued that the strict application of the various aspects of the TNRP and Road Design Note (06-01) would generate inequitable outcomes as “Road Design Note (06-01) includes an exception for providing noise attenuation where residential development has occurred after a road reserve has been set aside.” Should MRPV strictly apply the Victorian TNRP, this may result in sensitive receivers built after the 1960s not being strictly eligible for attenuation of significantly elevated traffic noise from the project as the road reserve was created in the 1960s. In addition to this, the residents of Waterways Estate are party to a Section 173 agreement under the P&E Act that requires attenuation within the road reserve, regardless of whether attenuation would be required through the application of the TNRP.

MRPV has chosen not to apply another consideration in the TNRP to the project which would limit noise exposure to +12dB(A) for receivers with a low existing ambient noise level (i.e. less than 50dB(A) $L_{10,18\text{hour}}$). MRPV contended that it would not be feasible to apply this aspect of the policy as the disbenefits outweigh the prospective benefits. Higher noise barriers would have greater adverse visual impact and increased cost.

MRPV has not provided a robust feasibility assessment to justify not limiting operational noise increases to +12dB(A). They did, however, indicate that some residents with low ambient noise levels did not warrant attenuation as they were not strictly entitled to noise mitigation according to the TRNP, as they were constructed adjacent to a pre-existing road reservation.

Contrary to MRPV’s submission, the precedent for limiting noise increases to +12dB(A) in low ambient noise environments, including where there is reservation, is relatively well established through a number of VicRoads’ projects (e.g. Eastern Freeway extension), despite what the TRNP states as guidance. Having accepted that the TRNP provides applicable policy parameters to implement for the project, it is my view that MRPA must apply the policy framework consistently and not arbitrarily exclude particular aspects.

The EES did not quantify the number of residents with existing background noise levels of 50dB(A) $L_{10,18\text{hour}}$ or less, rather provided a polygon estimate (EES Appendix E, Figures 8.1, 8.2, 8.3). Based on the existing noise levels presented within the EES, this would in effect limit exposure for affected properties to from 60 to 61dB(A) $L_{10,18\text{ hr}}$ in Dingley Village and Aspendale Gardens and Waterways Estate.

MRPV should be appropriately applying TNRP to limit potentially significant impacts on sensitive receptors to acceptable levels. The policy provides for an exemption from the limitation of +12dB(A) increase if a feasibility assessment demonstrates there are exceptional circumstances that prevent this target from being achieved. It is my assessment that the evidence provided to the IAC and in the EES does not indicate that such exceptional circumstances have been met in this case. It is my recommendation that the EPRs include the requirement to limit noise exposure to +12dB(A) for receivers with an existing ambient noise level of less than 50dB(A) $L_{10,18\text{hour}}$.

Assessment height for habitable buildings

Under VicRoads’ *Traffic Noise Measurement Requirements for Acoustic Consultants 2011*, noise is measured at the ground level of premises. The IAC heard several submissions which argued that all habitable levels above ground level should be considered. MRPV rejected this proposal, noting that a similar recommendation had been rejected for the Westgate Tunnel Project. The IAC report noted that the number of two-storey houses that may be affected by the project was not interrogated in the EES or in expert witness statements to the IAC. The IAC agreed that strict application of the TRNP meant that only the ground level of sensitive uses should be considered but raised concern that potential impacts on sensitive receptors (including in relation to sleep disturbance) is not explicitly addressed for multi-storey residences.

Operational noise (traffic noise) on non-residential areas

The EES defined sensitive receptors in accordance with the TNRP. The EES notes that public open space is not considered a sensitive receptor under this policy and would not be eligible for noise attenuation as a result.

Braeside Park was identified in the EES as a public space with areas of biodiversity significance (see Section 5.2 and Appendix A). Here, noise attenuation should be considered to minimise the impact on fauna, particularly birds protected under the FFG and EPBC Acts. While there is no definitive threshold for acceptability of noise impacts on birds, an arbitrary limit of 60dB(A) $L_{10,18\text{ hr}}$ was proposed in the EES. The limit was derived from the literature and discussed at the IAC hearing. The literature recommends maximising operational road noise to 50-60dB(A) to avoid impacts to birds.

MRPV updated EPRs in response to submissions and tabled revised versions at the IAC hearing. The changes to EPR B1 include requirements for multi-function fauna barriers at Braeside Park, Woodlands Wetlands and Waterways Wetlands to incorporate acoustic attenuation. Modelling presented to the IAC indicated that requirements proposed in EPR B1 would mitigate noise impacts to Braeside Park, limiting noise in most areas of the park to 63dB(A) $L_{10,18\text{ hour}}$, and to 60dB(A) $L_{10,18\text{ hour}}$ in Braeside Park Wetlands and Woodlands Wetlands. Noise modelling for Waterways Wetlands was not presented to the IAC. The IAC recommends a 3m high fence along the entire length of Braeside Park’s boundary with the project.

Kingston City Council’s expert witness, Mr Leo, provided alternative EPR recommendations to the IAC. He proposed an EPR that would limit noise impacts to 63dB(A) $L_{10,18\text{ hour}}$ in passive open space in Braeside Park and a noise limit of 60dB(A) $L_{10,18\text{ hour}}$ in the wetland areas. Mr Leo indicated that the proposed barrier heights of EPR B1 would be sufficient for acoustic purposes.

I note that the use of L_{10} as a noise metric, which is derived from and used for assessing traffic noise, is not an appropriate metric for defining noise limits in open space. I also note that contrary to the TNRP, there was no evidence presented that MRPV had consulted with local communities on the need for and type of protection (if necessary) for small areas of passive open space.

While no guidelines on open space are available within Australia, indicators and criteria for quiet areas have been published in Europe and indicate an upper level in urban areas to be 55dB(A) L_{day} which would correlate to approximately 56dB(A) $L_{10,18\text{ hour}}$ (free field) or approximately 59dB(A) $L_{10,18\text{ hour}}$ (façade level). While this is significantly lower than the suggested 63dB(A) $L_{10,18\text{ hour}}$ in Braeside Park and 60dB(A) $L_{10,18\text{ hour}}$ in the wetland area, given the area of the open space, it is not unreasonable to assume that quieter areas will be available further from the road alignment.

I therefore agree with the IAC that Braeside Park and the key wetlands areas in Woodlands Industrial Estate and Braeside Park require noise mitigation. EPR B1 (Appendix E, IAC Report) should adequately address the concerns raised by Mr Leo and will provide sufficient noise attenuation for these locations.

Assessment

- The project can be constructed and operated with acceptable impacts from construction and traffic noise on amenity, subject to implementation of the findings and recommendations of this assessment.
- With the inclusion of specific daytime noise targets in a construction noise and vibration management plan, the potential impacts of construction noise and vibration is acceptable.
- The impacts of construction noise and vibration can be appropriately managed through EPR NV2.
- I agree with the IAC’s recommendations that industrial and commercial properties are not considered sensitive receivers and are therefore not eligible under the TNRP for traffic noise mitigation treatment.

- Likely noise impacts on sensitive receptors are considered acceptable providing the findings and recommendations of my assessment are implemented.
- The project objective noise levels are mostly adequate for the project. However, the current proposal of 63dB(A) $L_{10,18\text{hour}}$ for receivers with an existing ambient noise level of less than 50dB(A) $L_{10,18\text{hour}}$ is unacceptable. The project should be limiting maximum noise increase of 12dBA for receivers with an existing ambient noise level of less than 50dB(A) $L_{10,18\text{hour}}$.
- Noise impacts on public open space are considered acceptable, with potential noise impacts to be limited to 60dB(A) $L_{10,18\text{hour}}$ at sensitive wetland areas and to 63dB(A) $L_{10,18\text{hour}}$ at the passive open space of Braeside Park. EPR B1 will adequately define these impact thresholds.
- EPRs, modified according the findings of this assessment, are sufficient to manage the effects of noise and vibration impacts.

5.5 Landscape values and visual amenity

Evaluation objective

To minimise adverse effects on landscape values, visual amenity and recreational values of public open space and on residents’ visual amenity, to the extent practicable.

Landscape, urban design and visual impacts are addressed in Chapter 11, Appendix D and Attachment III of the EES. These impacts are also addressed in Section 9 of the IAC Report. Eight EPRs have been proposed to manage landscape, urban design and visual impacts, three of which have been subject to recommendations by the IAC.

Assessment context

The project could affect landscape character, visual amenity and urban design in the residential areas of Dingley Village, Braeside Park, Waterways and Aspendale Gardens. This may result in reduced residential and neighbourhood amenity due to a combination of overshadowing, loss of informal public open space and change in aesthetic quality of open and urban spaces.

The EES characterises and assesses the potential impacts for nine landscape character areas (LCAs). Of these, three were ascribed an existing landscape value of very high (Braeside woodlands, central wetlands, Waterways Estate), two moderate (Dingley Village and Aspendale Gardens residential) and three low to moderate (green wedge north, industrial business park, green wedge south).

Impacts were assessed in the EES for a timeframe of seven years after project completion, assuming successful application of standard mitigation.

Discussion

Construction impacts

There will be unavoidable short-term visual impacts from the construction of the project: construction-related lighting; and damage to or removal of vegetation. However, the residual impacts of these activities can be adequately minimised through the implementation of EPR LV3 (to reinstate vegetation) and EPR LV5 (management of construction lighting). It is my assessment that the residual impacts will be minimised to acceptable levels.

Operational impacts

Not surprisingly the EES predicted the highest landscape and visual impacts where there is the greatest sensitivity to change and the highest degree of change: central wetlands, Waterways Estate. These LCAs are particularly sensitive, given their flat terrain, natural values and the views across open wetland environments.

The EES predicts that seven years after project completion the landscape and visual impacts at the Waterways Estate location will still be very high. The potential impacts predicted for Dingley Village and

Aspendale Gardens residential were high, but with additional mitigation that impact can be expected to reduce to moderate after seven years.

The primary mechanism for managing visual impacts through the project’s operation (including landscape character impacts) will be EPR LV1. This EPR stipulates requirements of landscaping and urban design planning during the detailed design phase of project development. The IAC notes that effective implementation of EPR LV1, in addition to 15m band of dense plantings between the bypass and residences within 35m of the roadway, will ensure acceptable visual impacts. I echo the IAC’s sentiments and note that EPR LV 1 mostly provides adequate provisions to ensure acceptable outcomes related to visual impact. However, I also recognise this EPR has a relationship with other EPR objectives and outcomes such as for noise and biodiversity, so the final form of EPR LV1 will need to have regard to any relevant landscape related measures being used to meet other EPRs. This interface and influence on urban design outcomes will need to be carefully managed by MRPV and the contractor.

It is expected that there will be residual visual impacts in most residential areas, particularly Waterways Estate, Aspendale Gardens, Dingley Village and Chelsea Heights. However, I consider that the application of EPRs will enable the residual impacts on these areas to become acceptable over time. Potential impacts on some of the specific LCAs very sensitive to landscape and visual impacts are examined in more detail below.

Waterways Estate

The EES includes a VicRoads landscape concept plan that proposes substantial tree planting close to the bridges over the Waterways Wetlands. The plantings are proposed to minimise visual impact, but do not appear consistent with recommendations provided to ameliorate biodiversity impacts at Waterways Wetlands under the proposed bridging structure.

I have concluded in Section 5.2 that in this location biodiversity outcomes (for nationally threatened ecological communities) should be prioritised over other objectives. Consequently, plantings proposed to soften the visual impact of the elevated bridge structure should be sited to respect the integrity of the two threatened ecological communities. MRPV should consider off-reservation planting where appropriate, subject to negotiated agreement with land manager/owners.

Braeside Park/central wetlands

Multi-functional fauna barriers (MFFB) are proposed alongside Braeside Park to minimise impacts to avifauna (see Section 5.2). The IAC recommended that MFFBs alongside Braeside Park should be increased to be a minimum height of 3m along the entire Braeside Park boundary with the project as a total solution to a mitigate noise and avifauna/vehicle collisions, in addition to providing more effective screening of truck traffic on the freeway. The IAC and EES did not examine the potential for overshadowing impacts of a MFFB increased from 2-3m. However, I am confident that this can be assessed and resolved in detailed design.

I support the IACs conclusion that raising the MFFB height from 2m to a minimum of 3m will reduce other impacts and is likely to generate a net improvement for the amenity and other uses of this public open space.

Braeside park/central wetlands (urban design of underpass)

The IAC heard concerns with the shared use underpass connecting Park Way to Braeside Park. Submitters raised concerns of public safety and reduced community connectivity should the design of the underpass be unsatisfactory.

The IAC interrogated the mechanisms of ensuring a quality urban design outcome. It concluded that EPRs LV1 and LV2 are adequate to ensure the delivery of a best practice design of the Braeside Park Underpass. EPR LV1 considers general urban design and EPR LV2 provides for crime prevention through environmental

design. I agree with the IAC, noting that the EPRs will ensure an appropriate urban design outcome that promotes public safety and mitigates the loss of open space amenity.

Independent design reviewer

The IAC agreed with MRPV’s proposal to include an additional EPR LV8 utilising an independent urban design review panel. I agree with the IAC. This decision is in line with previous assessments of transport projects. However, the scope of the panel is unclear in the EPR endorsed by the IAC. Hence, I recommend that EPR LV8 should be amended to outline the program and authority of the urban design review panel.

Additional noise attenuation

Visual impact of noise barriers was assessed in the EES. I concluded in Section 5.4 that additional noise attenuation is required to limit noise increase of 12dB(A) for receivers with an existing ambient noise level of less than 50dB(A) $L_{10,18\text{hour}}$.

In the EES (Appendix E) MRPV detailed what noise barriers would be required where, to achieve a maximum noise increase of 12dB(A). Project areas that will have high levels of residual visual impacts coincide with regions that require further noise mitigation. These areas include Dingley Village, Waterways Estate and Aspendale Gardens. Consequently, there is potential for increased visual impact in these areas because of further mitigation. For example, noise walls may need to be increased in height at Waterways Estate. The original proposal required a 2-3m high noise wall, but to meet the level of attenuation necessary (consistent with the findings of my assessment) a 4-5m high noise wall might be required if no other mitigation measures were also employed. Visual impacts of these additional attenuation measures (e.g. 4-5m noise wall at Waterways Estate), was not considered in the EES nor in the IAC Report.

Due to my recommendation for further noise attenuation, there may be a level of uncertainty regarding the residual visual impact that would result from higher noise walls. During detailed design, MRPV must carefully balance noise and visual amenity EPRs to minimise the impacts of the project’s sights and sounds on surrounding residents.

Assessment

- The project can have acceptable impacts on landscape values and visual amenity, subject to implementation of the findings and recommendations of the IAC and this assessment.
- The likely landscape and visual impacts, particularly at Waterways Estate, Dingley Village and Aspendale Gardens can be reduced to acceptable levels.
- With the implementation of EPRs that consider my recommendations, the overall visual impacts of the project will be adequately addressed to acceptable levels.
- EPR LV1 has a relationship with other EPR objectives and outcomes such as for noise and biodiversity, so the final form of EPR LV1 will need to have regard to these influences on urban design outcomes.
- Such interfaces will need to be carefully managed by MRPV and the contractor. Any conflicts between implementing EPR LV1 and maintaining the ecological integrity of EPBC communities in Waterways Estate should be resolved by prioritising the EPBC communities over visual impact.
- A noise wall of minimum 3m high along Braeside Park is likely to generate a net improvement for the amenity and other uses of this public open space.
- Independent urban design strategy should outline the program and terms of reference for the Independent urban design review panel.
- Due to the need for further noise mitigation, potential attenuation measures may give rise to additional visual impacts that will to be examined and mitigated to the extent practicable.

5.6 Land contamination and acid sulphate soils

Evaluation objectives

To prevent adverse environmental or health effects from disturbing, storing or influencing the transport/movement of contaminated or acid-forming material.

Land contamination and acid sulphate soil (ASS) impacts are addressed in Chapter 18 and Appendix L of the EES and in Chapter 15 of the IAC report. Of the seven EPRs that deal with contamination and ASS matters, five have been the subject of recommendations by the IAC.

Assessment context

The project will be a net consumer of fill for extensive embankments, with minimal excavation or spoil generation.

Potential acid sulphate soil (PASS) and ASS occur naturally in and adjacent to the central and southern portions of the project area. Disturbing these materials during construction cannot be entirely avoided. Activities such as piling for the bridge at the Waterways Wetlands or excavating trenches has some potential to oxidise these materials. In some cases, this can generate acid leachate.

Land contamination in the project area comprises former landfills in and adjacent to the northern portion of the project area. Construction will disturb landfill material and could alter gas migration and create preferential pathways for contaminant migration. Asbestos containing material and per- and poly-fluoroalkyl substances (PFAS) may also be encountered in the central portion of the project area.

Discussion

Imported fill and approximately 50,000 to 65,000 cubic metres of Category C Contaminated Soil, mainly from the former landfill, will need to be managed during construction. The IAC generally supported MRPV’s proposed management approach but recommended that EPR CL1 (Soil Management Plan) refer to specific EPA requirements for assessing site contamination, reusing contaminated soil and soil sampling. Similarly, the IAC found that EPR CL6 (PFAS Management Plan) requires consultation with the EPA.

MRPV’s proposed driven piling into ASS/PASS materials is expected to minimise spoil, disturbance and oxidation of these materials. Excavated ASS/PASS will be managed in situ or removed from site. The IAC agrees with Kingston City Council and the EPA that MRPV’s proposed management of ASS/PASS is sufficient. However, the IAC sought further clarification in EPR CL2 by requiring site specific data and specifying sensitive receptors to be considered when selecting ASS/PASS management sites.

MRPV’s witness explained that the project would cross the former landfill at Lot 1 Grange Road on a ‘floating pavement structure’ supported by piles driven into the underlying Brighton Sand Formation to minimise disturbance of landfill material. This section of road will interfere with landfill gas migration and landfill gas could accumulate to unsafe levels in underground services, pits and other voids. Management and monitoring of landfill gas to address these issues is provided for by EPRs CL3 to CL6.

The IAC recommended refinements to EPRs CL3 and CL5. While EPR CL3 already provides for design in conjunction with VicRoads and EPA, Kingston City Council sought an amendment to require a review of the proposed passive landfill gas capture and ventilation system design by the independent reviewer and environmental auditor. The IAC supported this amendment, due to the innovative nature of the design in the Victorian context and landfill uncertainties, but the IAC report notes it was not supported by MRPV. I support the IAC’s recommendation in principle, given the health and safety risks associated with landfill gas migration, and further recommend that MRPV seek independent review of the design and installation by an EPA-appointed auditor. The IAC also agreed with EPA’s request that it be consulted during development of the Landfill Gas Management Plan (Operation) and recommended this amendment to EPR CL5.

Assessment

- The project can be constructed and managed to ensure the health, safety and environmental risks of disturbing contaminated land and ASS/PASS are acceptable.
- I generally support the IAC’s recommended changes to the CL EPRs.

5.7 Air quality

Evaluation objective

To minimise adverse air quality and other amenity effects on nearby residents and other sensitive receptors and land uses, having regard to relevant limits, targets or standards.

Air quality impacts and greenhouse gas emissions are addressed in Chapter 13 and Appendices F and G of the EES. Chapter 11 of the IAC Report considers the impacts and submissions made on these matters. Two EPRs deal with air quality and two deal with greenhouse gas emissions. The IAC agreed to the latest version of the EPRs tabled at the IAC and provided recommendations to EPR LV1, a landscape and visual EPR, to help meet air quality objectives.

Assessment context

The project will impact on air quality and will contribute to greenhouse gas emissions through both construction and operational phases. The existing adjacent land uses (see Section 5.9) vary in their sensitivity to air quality impacts. These uses include residential precincts, industrial areas and public open space that provides for recreation and biodiversity values.

The IAC identified two key issues relevant to the assessment of air quality impacts:

- the need for adequate management of air quality during the construction phase for both residential and commercial receptors; and
- ensuring vehicle emissions on the freeway do not compromise air quality standards at sensitive receptors.

Discussion

The risk assessment presented in the EES ascribed negligible to low risk to the environment from all potential air quality impacts. The design criteria and mitigation measures for managing air quality were based on the State Environment Protection Policies – Air Quality Management (SEPP AQM 2001) and Ambient Air Quality (SEPP AAQ 1999). The IAC received several submissions concerned about air quality and health effects from the project.

Modelling and assessment criteria

As noted in SEPP AQM, vehicles emissions are a significant influence on air quality in Melbourne, so contributions to air quality from new roads need to be modelled and assessed using a ‘regulatory model’ (i.e. approved by EPA) and design criteria set out with the SEPP. MRPV utilised the Ausroads dispersion model to predict potential dust emissions from construction and vehicle emissions from operation of the road. However, the EPA Victoria approved model under the SEPP AQM for emission assessments and related regulatory processes in Victoria is AERMOD. AERMOD was the model utilised to predict emissions in other recent EESs developed for road projects.

The SEPP AQM includes design criteria for assessment of proposed emission sources. MRPV used the design criteria according to guidance set out in Schedule C to the SEPP AQM. However, EPA’s submission (p.7) stated: “in accordance with emerging scientific evidence and best practice, EPA recommends the use of the SEPP AAQ environment air quality objective to compare and assess air pollution levels measured near roads” (rather than relying on design criteria). While the EES did not accord with this EPA advice on emerging best practice it did assess the predicted air quality impacts against criteria consistent with current legislative requirements under SEPP AQM.

MRPV tabled a variation to their air quality evidence at the IAC, in which they amended EPR AQ2 to include consideration of commercial receptors and included the requirement to monitor at both residential and commercial receptors. The IAC agreed with this change. I consider that ‘sensitive receptors’ requiring assessment and monitoring should be defined and identified consistent with the legislative framework for air quality (SEPP AQM). This includes some non-residential sensitive receptors such as hospitals, schools, or aged care facilities and the like. However, it is at MRPV’s discretion to augment monitoring to cover commercial receptors in addition to sensitive receptors defined in SEPP AQM.

Construction impacts

The results from the Ausroads dispersion model presented in the EES show elevated dust levels from construction activities (with standard mitigation measures in place). The model predicts exceedances up to 65m from the edge of construction zone for particulate matter 10µm or less in diameter (PM₁₀), and total suspended particulates (TSP), but only on only a few days during construction with hot, dry conditions and northerly winds exacerbating erosion and dust transport. For much of the construction phase, elevated TSP and PM₁₀ will not extend beyond the reservation.

The EES concluded that the potential impacts from construction would be localised, intermittent, and for very short periods during the two-year construction phase. It states that these impacts will be readily managed via dust monitoring and mitigation measures included in a CEMP, although the EES Air Quality Appendix (p. 62) notes that “additional dust control measures are likely to be required to minimise impacts on residents living adjacent to the road.”

As noted above, the estimation of construction related dust (TSP and PM₁₀) in the EES used the Ausroads dispersion model, which is not the current EPA approved model. This increases the importance of air quality monitoring and adaptive management measure during construction. I concur with EPA’s recommendation that an air quality management plan be explicitly incorporated into EPR AQ2 to ensure this is undertaken.

EPR AQ2 tabled at the IAC recommends monitoring PM₁₀ to ensure effective management of dust. I recommend real-time monitoring should be implemented to manage dust control as it has improved capacity to respond to weather events in time to minimise impacts to sensitive receptors.

The construction of the project could generate odour impacts from the disturbance of an old landfill in the northern part of the alignment. The proposed construction over the old landfill in the northern part of the alignment includes covering the landfill surface with a 600mm thick layer of gravel and driving piles through the landfill into the underlying soils. It is expected that some gases will be released during the piling and potentially continue to seep out into the gravel layer following that. The main issue or risk is related to odours from hydrogen sulphide or other gases released from the landfill. However, there are no sensitive receptors within 300m of this landfill site. The EES considers it unlikely that piling will cause odour impacts at distant sensitive receptors which is supported by the IAC.

Operational impacts

The potential operational air quality risks assessed in the EES included impacts on sensitive receptors arising from vehicle emissions (i.e. Carbon Monoxide (CO), Nitrogen Dioxide (NO₂), PM_{2.5} and PM₁₀).

The EES considered emission rates for likely vehicle volumes during the years 2017, 2021 and 2031. The 2021 scenario was selected as the worst-case emissions for modelling, because as traffic volumes are expected to increase by 10%, emissions per vehicle are expected to decrease by 10% between 2021 and 2031.

The 99th percentile concentrations predicted by the Ausroads model fell below SEPP AQM design criteria for CO, NO₂, PM₁₀ and PM_{2.5} at all times, at sensitive receptors along the road alignment. The EES stated that peak concentrations predicted for CO, PM₁₀ and PM_{2.5} are well within the design criteria at receptors, but the

levels of NO₂ are predicted to be only slightly below the design criteria at some nearby receptors in the locations of Dingley, Chelsea Heights, Aspendale Gardens and Braeside Park. Also, the predicted peak and average concentrations of NO₂ within 20m from the road (where there are no identified sensitive receptors) do exceed the design criteria.

Submissions to the IAC and the IAC itself highlighted the recognised link between human health and air pollution, particularly in relation to fine airborne particulates such PM_{2.5}. In MRPV’s submission to the IAC it accepted that a possible future standard for PM_{2.5} is the 2025 quality objective of 7µg/m³ (annual average). The IAC agreed that this should be regarded as an aspirational goal but noted that the predictions of PM_{2.5} in the EES already indicate that the level of 6.5ug/m³ is below this goal. The EES modelling data show that an annual average of 7µg/m³ should be achieved at 30-35m from the road, which is the distance to the Chelsea Heights lifestyle village.

MRPV’s expert witness, Dr Wallis, considered a band of dense vegetation (15m) could help improve air quality during the operational phase of the project. The IAC agreed with this and suggested the proposed EPR LV1 should include this as an additional air quality management measure, which I support.

Noting the degree of uncertainty associated with the air quality modelling predictions stemming from the use of an older model, I consider it appropriate to ensure operational monitoring data is obtained to confirm the model predictions and inform potential mitigation responses.

Greenhouse gas emissions

Greenhouse gas emissions were assessed in the EES in accordance with *the National Greenhouse and Energy Reporting Act 2007*. The expected greenhouse gas emissions are projected to be below thresholds listed in the act. As such, MRPV are not required to report on the project’s energy use and greenhouse gas emissions.

Greenhouse gas emissions associated with construction activities, mainly associated with construction traffic and machinery, are not considered significant. Regardless the project has proposed EPRs to ensure further minimisation of greenhouse gas emissions during construction phase.

Assessment

- There is low risk from construction and operation of the project on greenhouse gas emissions, air quality and related sensitive receptors.
- Impacts on air quality arising from dust dispersed during construction has the potential to not meet environmental quality objectives at a small number of receptors on isolated days (under worst-case conditions), although monitoring and adaptive management will be able to address this.
- An air quality management plan be incorporated into the EPR AQ2 to help ensure monitoring and adaptive management occurs during construction.
- The modelled operational air quality impacts arising from the road are minimal and only pertain to some elevated levels of NO₂, slightly below the design criteria at some locations. However, monitoring is needed to confirm these predictions and whether any additional mitigation is required.
- The implementation of refined EPRs consistent with the recommendations of this assessment will adequately manage air quality impacts from construction and operation for sensitive receptors.

5.8 Cultural heritage

Evaluation objective

To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.

Aboriginal and historic cultural heritage impacts are addressed in Chapters 14 and 15 and Appendices H and I respectively of the EES and in Chapter 12 of the IAC report. Of the three EPRs that deal with heritage matters, one was the subject of recommendations by the IAC.

Assessment context

The EES identified the historic heritage precinct associated with the former Braeside Park Precinct (wastewater treatment plant) as the only historic heritage asset that might be affected by the project. Buildings that contribute to the heritage character of the precinct are currently used by Parks Victoria for administrative and operational purposes associated with management of Braeside Park. MRPV has sought to minimise impacts on Parks Victoria’s business by separating the freeway from the buildings as far as practicable within the existing alignment reservation.

EES investigations identified discrepancies between the mapping of the Heritage Overlay in the Kingston Planning Scheme for the Braeside Park Precinct (HO104) and the actual location of heritage assets on the ground. The draft PSA included in the EES proposed changes to the Heritage Overlay to correct the anomalies.

Aboriginal cultural heritage values are to be addressed through a cultural heritage management plan (CHMP) under the *Aboriginal Heritage Act 2006*. Under the act a CHMP is required for any project subject to an EES, irrespective of other triggers.

EES investigations found several Aboriginal artefacts, similar in nature to those known from the broader locality. No Aboriginal cultural heritage sites or values of other types were found within the area to be affected by project works. It is unlikely that additional sites of higher significance than those already found will be detected during project construction.

Discussion

The IAC concluded that historic heritage values will not be significantly affected by the project. It endorsed MRPV’s proposal to work collaboratively with Parks Victoria and Kingston City Council to refine the Heritage Overlay for the Braeside Park Precinct. I expect the corrected Heritage Overlay will not be ready in time for consideration in the context of the draft amendment for the project. I support the careful and co-operative mapping of the relevant heritage values to lead to correct recognition of the site through a further PSA at an appropriate time.

The CHMP process provides for protection of known and previously unknown Aboriginal heritage values. I support the implementation of that process and its outcomes in accordance with established standards and procedures.

Assessment

- The project can be constructed and operated with acceptable impacts on heritage values.
- Revision of HO104 in the Kingston Planning Scheme should not be included in the PSA for the Mordialloc Bypass project, but should be resolved collaboratively between Kingston City Council, Parks Victoria and MRPV and a further amendment to the planning scheme to reflect the outcomes of that work be proposed at the appropriate time.
- No other impacts on historic heritage values are expected.
- The CHMP is the appropriate mechanism for management of impacts on Aboriginal cultural heritage.
- The heritage EPRs endorsed by the IAC are appropriate for the project.

5.9 Land use and planning

Evaluation objective

To minimise potential adverse land use and planning effects, including impacts on open space.

Land use and planning impacts are addressed in Chapter 9 and Appendix B of the EES and Chapter 7 of the IAC report. I am generally satisfied that the impacts of the project on land use and planning matters are accurately described in these parts of the EES. There are no specific EPRs for land use and planning.

Assessment context

The project alignment traverses the Greater Dandenong and Kingston planning schemes. Both will require modification for the project to proceed. Land uses surrounding the project include residential, industrial, commercial, recreational and green wedge land uses. The main impacts of the project identified by the IAC on land use and planning include:

- amenity impacts including traffic, visual, noise, vibration and dust;
- impacts from increased greenhouse gas emissions; and
- impacts from increased vehicle traffic.

Discussion

Strategic support and consistency with planning policy

The project was first contemplated as an arterial road in the *Melbourne Metropolitan Planning Scheme 1954: Report* and most of the land required for the project has been reserved for road purposes in the planning schemes since the 1980s.

The project enjoys broad strategic support in state planning policy including *Plan Melbourne 2017 – 2050* (Plan Melbourne) and the Planning Policy Framework. Outcome 3 of Plan Melbourne is that “Melbourne has an integrated transport system that connects people to jobs and services and goods to market.” The project is intended to contribute to this outcome by improving transport in Melbourne’s outer suburbs, particularly in conjunction with other road and rail projects in this part of Melbourne and improving transport accessibility and connectivity.

State planning policies relevant to the project include:

- Clause 11 – Metropolitan Strategy;
- Clause 12 – Environment and landscape values;
- Clause 13 – Environmental risks and amenity;
- Clause 15 – Built environment and heritage; and
- Clause 18 – Transport.

The project also supports the intent of the local planning policy frameworks for each planning scheme to the extent that the proposed planning approval for the project would establish a framework to manage the environmental, social and economic effects of the project while at the same time facilitating a project that will deliver transport benefits.

It is my assessment that the project has support in planning policy including the Planning Policy Framework and Plan Melbourne.

General project impacts

Land use and planning impacts during construction are generally temporary in duration and include restrictions on access to open space, businesses and social networks, and amenity impacts such as noise and traffic. I am satisfied that these localised impacts can be appropriately managed through the EPRs and through plans that will be required under the EMF.

In terms of permanent loss of informal open space, the EES acknowledges that “while the informal open space within the proposed corridor will no longer be available to the public, this has been earmarked for road development since 1969 and formalised since 1981.” In this regard, I am satisfied that the loss of informal open space is acceptable.

Assessment

- The project can be implemented consistent with the planning policy and with acceptable impacts and benefits on surrounding land-uses.

- The project has broad strategic support in planning policy.
- The project will improve transport in this part of Melbourne particularly in terms of accessibility and connectivity.
- Amenity impacts from the project on surrounding land uses can be managed by the relevant EPRs.
- I note and support the IAC’s findings in relation to land use and planning impacts.

5.10 Social and economic

Evaluation objective

To minimise potential adverse social and economic effects, including impacts on open space, amenity, existing infrastructure, business functionality and access.

Social impacts are addressed in Chapter 19 and Appendix M of the EES and Chapter 16 of the IAC report, and economic impacts are addressed in Chapter 20 and Appendix N of the EES and Chapter 16 of the IAC report. I am generally satisfied that the impacts of the project on social and economic matters are accurately described in these parts of the EES. Two EPRs deal with social impacts and one of these EPRs has been subject to a recommendation by the IAC. Two EPRs deal with economic matters.

Assessment context

The project alignment traverses Greater Dandenong and Kingston local government areas and seven suburbs – Aspendale Gardens, Bangholme, Braeside, Chelsea Heights, Dingley Village, Heatherton and Waterways. These suburbs include established residential areas, open space, community facilities and services, and other valued places.

The EES identifies six key economic precincts along or adjacent to the project alignment:

- Chelsea Heights Node;
- Garden Boulevard;
- Governors Road Industrial Node;
- Green Wedge Zone land;
- Moorabbin Airport; and
- Woodlands Industrial Precinct.

Within these precincts there are a broad range of economic activities, including:

- agriculture;
- horticulture retail and wholesale;
- retail and service stations; and
- industrial and commercial uses.

Each of these suburbs will experience localised impacts during construction with several common social and economic issues across the project alignment, including:

- dislocation, loss and/or severance of residential areas, community facilities, valued places or open space;
- disruption or changes to local access routes and/or connections;
- amenity impacts including traffic, noise, vibration and dust;
- land acquisition impacts on businesses in Braeside;
- disruption to businesses during construction; and
- impacts to businesses during operation.

From an operational perspective, the project will result in built form changes from new infrastructure, including bridge structures and noise walls, as well as changes to traffic conditions and access routes particularly for residents of the Waterways Estate. However, the project is expected to deliver net social

benefit including the provision of new connections and access for pedestrians and cyclists, new landscaping, and reduced traffic congestion and travel times.

Discussion

The construction of the project will generate disruption and inconvenience to the people who live, work and operate businesses near the project. These impacts include restrictions on access to open space or housing estates, disruption to local access routes, amenity impacts such as traffic, noise and dust, potential disruption to utilities, and restrictions on access for deliveries or pedestrians. I am satisfied that these localised impacts can be appropriately managed through the EPRs, including EPRs E1, E2 and S2, and through plans that will be required under the EMF. In addition to ensuring that construction activities are appropriately managed, I also consider that good communication and consultation before and during the construction phase is essential. EPR S1 requires the preparation of a community and stakeholder engagement plan which will include processes and measures to provide notice of disruption during construction. I accept the suggestion made by the IAC to change EPR S1 to include reference to ‘land owners.’

Submitters were concerned about the permanent loss of informal open space and associated pathways within the road reserve. The EES acknowledges that public access to the road reserve would discontinue during construction of the project and on its completion. However, the land required for the project has been reserved for road purposes in the planning schemes since the 1980s and I am satisfied there would be a general awareness within the community that its use as informal open space was temporary.

Many submissions related to the impact of the project on businesses in Woodlands Industrial Estate due to proposed changes to Woodlands Drive. As discussed in Section 5.1, I support the modified design connecting the northbound off-ramp at Lower Dandenong Road to Woodlands Drive. Therefore, the potential impact of land acquisition on the properties in Braeside is avoided, and the modified design also retains existing access arrangements for businesses in this location.

During operation, the EES identified a range of expected benefits for the local and regional economy including:

- improved access to Moorabbin Airport, activity centres and employment opportunities;
- improved access to the Monash National Employment and Innovation Cluster and Dandenong National Employment and Innovation Cluster; and
- a more balanced transport network for this part of Melbourne through the provision of new shared use paths.

I acknowledge the economic benefits of the project provided its forecast performance is achieved.

Assessment

- The project can be implemented with acceptable social and economic impacts.
- Implementation of EPRs S1 and S2 combined with EPR EM3 and other EPRs that manage localised impacts during construction will minimise potential adverse social impacts.
- I accept the suggestion made by the IAC to change EPR S1 to include reference to land owners.
- Implementation of EPR E1 combined with EPR S1 and other EPRs that manage amenity impacts from the project will effectively reduce business disruption impacts.
- Implementation of EPR E2 will manage impacts on utility assets during construction.
- The modified alignment for Woodlands Drive avoids the potential impact of land acquisition on the properties in Braeside and retains existing access arrangements.
- The project will result in permanent built form changes and changed traffic conditions, but this is balanced by the expected net social benefits of the project.

6. Conclusion

My overall conclusion is that the project can proceed with acceptable environmental effects, subject to design, construction and operational mitigation and management measures meeting the standards endorsed in this assessment.

Without prejudice to any subsequent decisions, I am satisfied that in principle the proposed planning scheme amendment, with changes addressed in this assessment, can establish an appropriate environmental management regime for the project. The proposed requirement for Minister for Planning approval of an EMF, including EPRs, before main works commence will ensure the environmental standards outlined here will be clearly defined and met.

Environmental management and implementation should be subject to independent scrutiny through an appropriately qualified independent reviewer and environmental auditor. In the interests of transparency, results of monitoring programs to be conducted under the EMF should be published on a readily accessible website.

Lack of a contemporary traffic noise policy in Victoria hinders the assessment of major road construction projects. I have concluded that completing the review of the existing TNRP should be a priority.

I am satisfied that with the proposed environmental mitigation and management measures endorsed in this assessment impacts on MNES can be controlled within acceptable limits.

My assessment addresses the environmental effects of the project that have been adequately investigated through the EES process. My assessment does not endorse impacts resulting from subsequent project changes which have different or more severe environmental effects. My assessment also does not extend to an expanded or upgraded version of the project nor to other road network projects that might interact with the project in a traffic management sense.

My responses to the IAC's detailed recommendations are presented in Section 6.1. My comments on the proposed EPRs recommended by the IAC are presented in Appendix B.

6.1 Summary of response to inquiry recommendations

Based on the reasons set out in its report, the IAC recommended the Mordialloc Bypass Project be approved provided it is constructed and operated in accordance with the approved EMF and EPRs. The IAC also offered guidance on many matters of detail. My responses to that guidance are presented in Sections 4 and 5. Table 5 summarises my responses to the IAC's recommendations.

Table 5: Response to inquiry recommendations.

No	IAC recommendation	Summary response
The IAC recommended the following changes to the exhibited environmental and planning controls:		
1.	Approve the EMF, subject to the removal of the reference to the EMF being "updated and re-assessed by the Minister for Planning if traffic lanes are proposed to be added to the project in the future."	Noted. The proposed EMF must be prepared consistent with this assessment, including deletion of this reference, and then be submitted for my consideration and approval. Impacts not considered in the EES have not been assessed here, except as noted under IAC Recommendation 4 below.
2.	Adopt the IACs preferred version of the EPRs as shown in [IAC Report] Appendix E.	Generally supported, with variations discussed in this assessment and shown in Appendix B.

/cont.

Table 5 (cont.): Response to inquiry recommendations.

No	IAC recommendation	Summary response
3.	Adopt the IAC preferred version of the incorporated document as shown in [IAC Report] Appendix F.	Generally supported, subject to variations discussed in this assessment.
The IAC recommended the following project design inclusions and changes:		
4.	Construct one additional lane in each direction on the Mornington Peninsula Freeway between Thames Promenade and Springvale Road.	Noted. It is my assessment that the proposed level of service for the freeway east of Springvale Road is appropriate as a performance standard. The potential impacts of constructing additional lanes east of Springvale Road within the freeway reservation are unlikely to have environmental effects of any significance. Additional lanes must be designed and managed to ensure impacts on the Edithvale-Seaford Wetlands are avoided.
5.	Duplicate Centre Dandenong Road between Old Dandenong Road and Boundary Road, including upgrading the Boundary Road intersection.	Supported, this is broadly within the scope of the project examined within the EES and this assessment.
6.	Replace the Thames Promenade/Wells Road roundabout with traffic signals.	Noted. The proposed change appears unlikely to have significant environmental effects.
7.	Adopt the modified layout proposed for Woodlands Drive and the freeway off ramp to Lower Dandenong Road as presented to the Inquiry and Advisory Committee and shown in Figure 4 of this report.	Supported. The revised layout represents an appropriate response to matters raised by submitters and appears unlikely to have significant environmental effects.
8.	Construct a shared user pathway crossing across the north-east slip lane from Springvale Road to Mornington Peninsula Freeway.	Supported. The proposed change appears unlikely to have significant environmental effects.
The IAC recommended that the following associated works should be undertaken on the surrounding road network in conjunction with the project:		
9.	Upgrade the capacity of Centre Dandenong Road west of Boundary Road.	Noted. The environmental effects of these works were not investigated in the EES and have not been considered in this assessment. How and whether these works occur are outside of this project are matters for the Department of Transport and MRPV to examine.
10.	Upgrade the capacity of Governor Road either side of the Mordialloc Bypass.	Noted. The environmental effects of these works were not investigated in the EES and have not been considered in this assessment. How and whether these works occur are outside of this project are matters for the Department of Transport and MRPV to examine.

/cont.

Table 5 (cont.): Response to inquiry recommendations.

No	IAC recommendation	Summary response
11.	Upgrade the capacity of South Road between Warrigal Road and Nepean Highway.	Noted. The environmental effects of these works were not investigated in the EES and have not been considered in this assessment. How and whether these works occur are outside of this project are matters for the Department of Transport and MRPV to examine.
12.	Implement other local traffic improvements as required to address any unintended consequences of the project.	Noted. The environmental effects of possible further works were not investigated in the EES and have not been considered in this assessment. How and whether these works occur are outside of this project are matters for the Department of Transport and MRPV to examine.
The IAC made the following further recommendation:		
13.	MRPV should consult with Kingston City Council and Parks Victoria to resolve the HO104 extent.	Supported. When a conclusion is reached between the parties about the appropriate spatial extent of HO104, I encourage Kingston City Council to initiate a formal planning scheme amendment process.


HON RICHARD WYNNE MP
 Minister for Planning
 16/6/19

Appendix A Matters of national environmental significance

Under the bilateral agreement between the Australian and Victorian governments, the EES and this assessment must examine the project's likely impacts on matters of national environmental significance (MNES), as identified in the Commonwealth controlled action decision under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The controlling provisions are: the Ramsar listed Edithvale-Seaford Wetlands (sections 16 and 17B), listed threatened species and communities (sections 18 and 18A) and listed migratory species (sections 20 and 20A).

This appendix consolidates information on likely effects of the proposal on MNES protected under the EPBC Act, drawing upon the assessment of specific matters discussed in other sections of my assessment. This includes assessment findings on biodiversity (Section 5.2) and hydrology (Section 5.3).

Potential impacts on MNES are summarised in Chapter 22 and Appendix C of the EES. The more detailed information about potential impacts that relate to my assessment of impacts on MNES can be found in Chapters 10, 12, 16, 17 and 21 and in Appendices C, E, J and K of the EES. The EES identifies the key issues for MNES as the direct loss and fragmentation of habitat, mortality of protected fauna, disturbance and traffic noise, as well as the uncertainty associated with the level of impact upon significant migratory and waterbird species.

Section 21 of the IAC report examined the likely impacts on MNES. The overall finding of the IAC was that the project will not have a significant impact on MNES providing the mitigation and management measures proposed in the environmental performance requirements (EPRs) listed in Appendix E of the IAC report are effectively implemented. This is also explored below in relation to each of the MNES.

A.1 Edithvale-Seaford Wetlands (RAMSAR listed)

The Edithvale component of the Edithvale-Seaford Wetlands lies within a kilometre of the southern end of the project. The Edithvale Wetlands has northern and southern components either side of Edithvale Road. Potential impacts of the project on water quality and hydrology, including groundwater, and the associated risks to the ecology and habitat/vegetation of the wetlands were among the reasons an EES was required.

Groundwater

The EES concluded that the effects of potential changes to local groundwater (due to the project embankments/structures and potential compression of aquifers) will have insignificant hydrological and hydraulic effect on the Ramsar listed Edithvale and Seaford Wetlands.

Surface water

Changes to hydrology may affect the salinity, depth and surface area of the water bodies at Edithvale. Variation in hydrology can alter the frequency and duration of inundation of vegetation which may in turn change the composition of vegetation communities over time⁶. Such alterations can impact on the availability and quality of habitat for threatened and migratory birds such as the Australasian Bittern, which is listed in the ecological character description of the wetlands.

Changes to the surface water regime are expected for the southern portion of the Edithvale Wetlands, which has flow on effects on the northern component given the hydraulic connectivity between the two wetland components. The extent of change expected for surface water regimes will vary depending on whether additional lanes on the Mornington Peninsula Freeway section of the project are implemented.

⁶ Description of the ecological character of the Edithvale-Seaford Wetlands Ramsar Site (DSE, 2012)

The modelled results showed the project is expected to increase surface areas of waterbodies in both southern and northern components of the Edithvale Wetlands. This is expected to occur when there are more significant rainfall events during dry periods. During these dryer periods, water storage levels in the wetlands are well below average. The EES identified the 80th percentile of the predicted increases in inundated area was approximately 5% for the southern wetland and 7% for the northern wetlands. Should the project include additional lanes on the Mornington Peninsula Freeway component of the project area, the increase in 80th percentile of water surface area would rise to approximately 7.5% for the southern wetland and 10.5% for the northern wetlands.

The EES modelling predicted negligible increases in water depths for current climate conditions, except in wetland cells EN2 and EN3 in the northern wetlands. Their water levels are predicted to increase by 0.4 and 0.2m respectively (i.e. the 80th percentile of the predicted changes). However, impacts on these water levels are predicted to be very minor when considering the 50th percentiles (i.e. less than 5cm for EN2 and negligible for EN3).

Potential ecological impacts arising from this change were included in the flora and fauna assessment for the EES (Appendix C). However, the IAC noted that cells EN2 and EN3 have open expanses of permanent water fringed with tall marsh that are subject to drawdown in summer and dry periods, which may limit their susceptibility to ecological impacts arising from the predicted change in water level regime. The IAC accepted the EES’s conclusion that ecological impacts from predicted hydrological and hydraulic changes are anticipated to be insignificant.

I am satisfied that the expected changes to the hydrology of the Edithvale Wetlands are not likely to be significant in the context of the ecological character description and acceptable limits of change. The expected changes to depth and surface area of the southern and northern wetlands are expected to be within natural variation and to occur at times when the wetlands have capacity to absorb these changes. However, there are some uncertainties involved (e.g. persistence of changes to surface water and depth). If deeper, more extensive water from the increased inflows repeatedly remains for a considerable time it would have increase the potential for changes in habitat suitability for threatened and migratory birds listed in the ecological character description. While modelling indicates that the changes are expected to occur over short periods though, which is unlikely to lead to a change significant change in vegetation composition, the duration of this short period is still uncertain. Consequently, further management and mitigation is required to manage inherent uncertainties and associated risk.

My assessment (Section 5.3) includes expanding the EPRs to require changes in water flows to all wetlands to be minimised. This will help to maintain the wetlands’ resilience to the incremental increase in surface water, ensuring the hydrological characteristics of the Edithvale Wetlands are maintained to within acceptable limits which will minimise risk to the ecological values.

Water quality

The EES predicts a minor potential for changes to water quality. Modelling presented in the EES shows that proposed mitigation measures, particularly bioretention systems, would reduce pollution loads entering downstream wetlands compared to existing water quality conditions. Ecological impacts from water quality consequences of the project are therefore anticipated to be insignificant. Modelling was also undertaken for 2065 climate change scenarios which indicated that the proposed treatment approach might be less effective, but it would still meet overall urban stormwater targets for Melbourne.

The EES predictions also included a potential minor reduction in salinity, possibly due to increased runoff from impermeable surfaces in the catchment. The EES concluded that the possible change would be insignificant given the scale of the potential change in water levels. The EES also found the associated risk to vegetation and habitat values present in the wetlands to be very low.

As noted in Section 5.3, the successful protection of water quality during the operational phase is very much reliant upon bioretention systems being monitored and maintained (including periodic resetting). The IAC recommended a new Water Asset Management Plan (Operation) EPR (W7) that should explicitly address this matter, in order to help address uncertainty associated with long term effectiveness of treatment measures. I support the recommendation.

A.2 Threatened ecological communities

Threatened ecological communities describes the category of vegetation communities protected under the EPBC Act. Impacts to these vegetation communities are discussed in the Victorian context (i.e. Ecological Vegetation Class) in Section 5.2 of my assessment. To fulfil my obligations under the bilateral agreement, I have adopted the Significant Impact Guidelines 1.1 under the EPBC Act for determination of impact significance below.

Two listed threatened ecological communities, both listed as Critically Endangered, occur within the project area:

- Seasonal Herbaceous Wetlands (freshwater) of the temperate lowland plains; and
- Natural Damp Grassland of the Victorian Coastal Plains.

Although these communities exist near the project as planted vegetation in the Waterways Wetlands, they qualify for listing and potentially for offset requirements. The wetlands will be traversed by the dual bridges proposed for the project. Light penetration between the bridges will mitigate the over-shadowing effects of the structure on the vegetation communities to a degree, but some impact is expected, and over-shadowed vegetation is assumed to be lost for the purposes of accounting and offsets.

The EES (Appendix C) notes that the initial assessment was completed in accordance with the relevant Commonwealth guidelines and that without targeted mitigation there would be potential for MNES to be significantly affected. Following more detailed surveys, MRPV refined the bridge design to incorporate specific additional controls to reduce residual impacts on both ecological communities. MRPV concluded that these impacts are therefore minor and not significant. The IAC agreed with the proponent, finding that there will be no significant impact on either threatened community, given the application of EPRs to manage and mitigate potential impacts.

Seasonal Herbaceous Wetlands (Freshwater)

This vegetation community in natural conditions usually occurs in a treeless or sparsely treed context. Key component plant species have limited tolerance to shading. Whether through purposeful supplementary planting or natural colonisation, intrusion of shade-tolerant species, not typical of the listed community, in the area that will be affected by overshadowing, can be expected at least to dilute the integrity of the community. This will expose parts of the community to edge effects which might further diminish its ecological functionality. In its current condition the vegetation community provides habitat for fauna including some of the species discussed individually elsewhere in my assessment.

The total extent of proposed vegetation loss associated with Seasonal Herbaceous Wetlands (Freshwater) in the EPBC referral was listed as 2.40Ha. This amount has been reduced throughout the EES process to a proposed maximum clearance of 0.24Ha. The EES notes that at the time of referral an area north of Bowen Parkway had been classified as Seasonal Herbaceous Wetlands (Freshwater) but has subsequently been declassified as discussed in Section 4.3.2.1 of Appendix C in the EES. The part of the ecological community affected by the project, primarily due to overshadowing south of Bowen Parkway, represents about half of the total extent of the community near the project⁷.

⁷ See EES Main Report, Figure 22.4.

The design of the project across the Waterways Wetlands includes bridging and a constrained construction footprint to reduce impacts on the vegetation, which was put in place through a sophisticated and well-planned habitat restoration program. I am satisfied that the proposed approach reflects an appropriate focus on protecting the vegetation as far as practicable, while acknowledging that both direct and indirect impacts are to some extent unavoidable.

The potential impacts on the Waterways Wetland hydrology was examined in the EES. It concluded the project will have no detectable impact on its inflow regime, as a negligible proportion of its catchment and inflows will be impacted by the project (less than 1% of the total inflow). However, the construction of the carriageways/bridges using piles between two wetland cells does have some potential to affect the internal wetland hydrology. The EES concluded that with appropriate design and construction methods this should also have negligible impacts.

EPR B5 as recommended by the IAC includes “as far as practicable, re-establishing the landform and substrate under the Mordialloc Creek bridge following bridge construction, including revegetation using shade tolerant aquatic species.” Neither the EES nor the IAC report found that shade tolerant species form a part of this ecological community. If shade tolerant species are planted as part of project works that are inconsistent with the community, the revegetated area could affect the remaining extent of the community. Therefore, it is my assessment that EPR B5 should specify use of species consistent with the corresponding threatened ecological community.

The residual impacts predicted for seasonal herbaceous wetlands from this project meet two Significant Impact Guidelines 1.1 criteria⁸. Firstly, the project will reduce the extent of an ecological community (directly and indirectly). Secondly, it will fragment or increase fragmentation of an ecological community. The guidelines identify clearing vegetation for roads as an example of fragmentation. Contrary to the conclusions of the EES and the IAC, I consider the proposed removal of 0.24Ha and further fragmentation to constitute a significant impact on the EPBC Act listed seasonal herbaceous wetlands ecological community. Consequently, it is my assessment that MRPV may need to address EPBC Act offset requirements to compensate for the predicted impact.

Natural Damp Grassland

As for the Seasonal Herbaceous Wetlands community, the *Natural Damp Grassland* community is likely to be affected indirectly by overshadowing and edge effects. Portions of the community known to be affected have been calculated and may be assumed to be lost for impact assessment and offsetting purposes. However, MRPV should still work to retain and maintain the community as far as practicable through sensitive design and appropriate construction approaches and through operational management of the project.

The total extent of proposed vegetation loss associated with Natural Damp Grassland in the EPBC referral was 0.03Ha. This extent has been revised through the EES process and now entails a proposed clearance of 0.04Ha. This represents about 10% of the mapped extent of Natural Damp Grassland near the project.⁹

The residual impacts to Natural Damp Grassland from the road project meet one criterion from the Significant Impact Guidelines 1.1¹⁰ as the project will reduce the extent of an ecological community.

As noted above, EPR B5 specifies shade tolerant species for mitigation of impacts, but otherwise suitable shade tolerant species might not form part of the Natural Damp Grassland community. If shade tolerant

⁸ *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*. Department of the Environment, Water, Heritage and the Arts, 2013.

⁹ EES Main Report, Figure 22.4

¹⁰ *Ibid*.

species planted are inconsistent with this community, there is potential for the revegetated area to alter the remaining extent of the community. It is my assessment that this EPR be further amended to specify the use of species consistent with this threatened ecological community as well.

Contrary to the conclusions of the EES and the IAC, I consider removal of 0.04Ha of Natural Damp Grassland could be a significant impact under the EPBC Act guidelines, given increased edge effects that could occur as well. Consequently, it is my assessment that MRPV may need to address EPBC Act offset requirements to compensate for the predicted loss of this protected community.

A.3 Threatened and migratory species

The following threatened and migratory species were identified in the EES as having a likelihood of occurrence greater than Low in the EES¹¹: Australasian Bittern, Glossy Ibis, Australian Painted Snipe, Latham’s Snipe, Common Greenshank, Marsh Sandpiper, Wood Sandpiper, Curlew Sandpiper, Pectoral Sandpiper, Sharp-tailed Sandpiper, Long-toed Stint, Red-necked Stint, Ruff, Fork-tailed Swift, White-throated Needletail, Rufous Fantail, Grey-headed Flying-Fox. The scoping requirements for the EES also mentioned Australian Fairy Tern and Eastern Curlew as species requiring special attention.

Most of the aforementioned species are unlikely to be affected are either not found regularly within the vicinity of the project or their habitat is not being impacted by the project. More detailed examination of relevant listed threatened and migratory species is set out below.

Australian Fairy Tern (*Sternula nereis nereis*)

Australian Fairy Tern is a small marine tern known to occur in Port Phillip Bay and in Western Port. It rarely occurs inland of the coastline¹². It is listed as Migratory under the EPBC Act. Although it is frequently recorded in the western and northern sectors of Port Phillip Bay, there are few records¹³ on the eastern side of Port Phillip Bay south of Brighton. As the project does not affect any marine or inshore areas and the species is rarely if ever present along the adjacent stretch of coastline, it is my assessment that the project will have no adverse effects on Australian Fairy Tern.

Eastern Curlew (*Numenius madagascariensis*)

Eastern Curlew is a large migratory (trans-equatorial) shorebird which in Australia primarily forages on intertidal mudflats, retreating to undisturbed roosting sites to rest at high tide¹⁴. It is one of several migratory shorebirds which has suffered substantial population declines that have coincided with large-scale “reclamation” of intertidal habitat in the East Asian-Australasian Flyway¹⁵. It is listed as Migratory and as Critically Endangered under the EPBC Act.

Little suitable foraging habitat for Eastern Curlew exists along the eastern shoreline of Port Phillip Bay. Roosting sites are rarely away from the coast or far above the high-water mark. Most Port Phillip Bay records are from the western part of Port Phillip Bay, including the Bellarine Peninsula¹⁶. Western Port (which features very extensive intertidal flats) also provides important habitat for the species¹⁷. The few records from the eastern side of Port Phillip Bay might represent individuals moving between those areas. No evidence identified through this EES process suggests that wetlands which could be affected by the project

¹¹ See EES Main Report, Table 22.6.

¹² *The Australian Bird Guide*, P. Menkhorst *et al*, CSIRO Publishing 2017.

¹³ No records in Birddata (Birdlife Australia’s database), viewed 23 May 2019.

¹⁴ Menkhorst *et al*, *ibid*.

¹⁵ Birdlife Australia 2017, *ibid*.

¹⁶ Birddata, viewed 23 May 2019.

¹⁷ *Waders: The Shorebirds of Australia*, D. Hollands & C. Minton, Bloomings Melbourne, 2012

represent regular or important habitat for the species. It is my assessment that the project will have no adverse effects on Eastern Curlew.

Curlew Sandpiper (*Calidris ferruginea*)

Curlew Sandpiper is a small migratory (trans-equatorial) shorebird which in Australia forages in intertidal, saline, estuarine and freshwater habitats, including shallow water as well as exposed mud. It is listed as Migratory under the EPBC Act. It has suffered substantial population declines that have coincided with large-scale “reclamation” of intertidal habitat in the East Asian-Australasian Flyway, to the degree that it is now listed as Critically Endangered under the EPBC Act. However, it is still widespread, its listing reflecting its severe decline from one of the most numerous migratory shorebirds in Australia rather than outright rarity.

The EES concludes negligible effect on this species provided mitigation measures are implemented and are effective. Given its range of habitat preferences, all the wetlands near the project could at times provide suitable habitat for the species. While most local records are from the Edithvale Wetlands, the other wetland sites adjacent to the project area may all support the species at times and should be considered as components of a broader complex of habitat for Curlew Sandpiper. There is therefore potential for the project to impact on the species.

Disturbance and roadkill are potential impact pathways for Curlew Sandpiper, due to the freeway alignment passing over the Waterways Wetlands and between the Braeside Park and Woodlands Industrial Estate Wetlands. Currently the project alignment at the latter location is open grassland which low-flying birds may cross with safety. Small shorebirds such as Curlew Sandpiper generally fly low to move short distances between habitat patches. Subject to suitable design, multi-function fauna barriers (MFFBs) may encourage birds to fly higher while crossing the freeway alignment. A design to provide reasonable protection from collision with most vehicles should be adopted, as supported by the IAC, although noting that constructed barriers high enough to push birds to fly at a level above any traffic collision risk may have adverse impacts on landscape values.

It would be appropriate to consider augmenting MFFBs with adjacent dense plantings of suitable shrub species which might grow higher than the constructed MFFBs. This could both reduce the intrusive landscape impact of barriers (see Section 5.5) and encourage birds to fly high enough to avoid risk of collision with high clearance trucks that can be expected to use the new freeway.

Birds such as Curlew Sandpiper might also be adversely affected by construction lighting and by operational noise and lights including vehicle headlights. However, most wetland sites near the project are already exposed to such effects. Curlew Sandpiper continues to use Edithvale Wetlands despite its bisection by Edithvale Road (which is a single carriageway arterial road, not a dual carriageway freeway). MRPV and the road operator should take all reasonable practical steps to prevent avoidable adverse impacts on the quality of adjacent habitat for wetland birds. However, it is neither feasible nor in my view necessary for all risk of impacts to be eliminated completely.

Provided measures proposed by MRPV and endorsed by the IAC and the additional measures recommended in this assessment are implemented conscientiously, it is my assessment that impacts on Curlew Sandpiper should be minimal and acceptable.

Sharp-tailed Sandpiper (*Calidris acuminata*)

Sharp-tailed Sandpiper is a small migratory (trans-equatorial) shorebird which in Australia forages in intertidal, estuarine, saline and freshwater habitats. Like Curlew Sandpiper, it uses both shallow water and exposed mud for foraging, but also feeds in adjacent low vegetation such as moist grassland. It often occurs with Curlew Sandpiper. It is listed as Migratory under the EPBC Act. It is one of the most numerous migratory shorebirds in south-eastern Australia and shows a stronger affinity for freshwater wetlands than most

species¹⁸. Edithvale-Seafood Wetlands regularly supports more than 1% of the flyway population of the species (which essentially equates to the global population), a factor contributing to the site’s Ramsar status¹⁹. Database records indicate that habitat at the Waterways, Braeside Park and Woodlands Industrial Estate is also regularly used²⁰.

As for Curlew Sandpiper, MFFBs augmented by appropriate vegetation plantings should help to encourage Sharp-tailed Sandpipers travelling between habitat patches to fly high enough over the project alignment to minimise vehicle collision risk. The species is likely to be tolerant to levels of disturbance due to light and noise that might be expected to arise from the project. Provided suitable mitigation measures are implemented, it is my assessment that impacts on Sharp-tailed Sandpiper should be acceptable.

Australasian Bittern (*Botaurus poiciloptilus*)

Australasian Bittern is a medium-large bittern (heron-like bird) dependent on reedbeds and similar vegetation for habitat. It is listed as Endangered under the EPBC Act, with an estimated Australian population in 2011 of less than 1,000 birds²¹, substantially down from an estimate of 2,500 breeding birds in 2000²². It has been adversely affected by draining of wetlands and by altered flow and watering regimes in systems modified by water extraction. Its mainland stronghold is south-eastern Australia, including much of the Murray-Darling Basin as well as coastal wetlands. The recent discovery that Australasian Bitterns are now breeding in rice crops in the New South Wales Riverina might indicate that the population could benefit from a new source of recruitment²³.

The wetlands in the vicinity of the project appear to be important habitat for the species, as it is recorded in the area more often²⁴ than in any other habitat areas in Victoria. The frequency of records should be considered in the context of the scarcity of the species and its cryptic behaviour.

Australasian Bitterns are known to be mobile, with journeys of greater than 500km having been recorded²⁵. Local flights between patches of habitat also occur; in those cases, birds rarely fly much higher than necessary to clear the reed-beds. It is therefore likely that flights between habitat patches such as Braeside Park Wetlands and Woodlands Industrial Estate Wetlands would occur at low level. Effective MFFBs will be essential to mitigate the risk of road kill once an operational freeway bisects those sites.

The persistence of Australasian Bitterns at such sites indicates a degree of tolerance to disturbance from human activities, including traffic, noise and artificial light. However, all efforts should be made through construction and operations management plans to minimise the risk of adverse impacts on the species. Excluding construction traffic from Edithvale Road as proposed by MRPV is supported, given it bisects the Edithvale Wetlands where Australasian Bitterns might move between reedbeds on either side of the road. Project construction traffic exclusion would need to be managed and monitored proactively by MRPV to ensure it is observed consistently.

¹⁸ Menkhorst *et al*, *ibid*.

¹⁹ *Description of the Ecological Character of the Edithvale-Seafood Wetlands Ramsar Site*, Department of Sustainability and Environment, Melbourne, 2012.

²⁰ Birddata, viewed 23 May 2019.

²¹ EPBC Act Listing advice.

²² *Action Plan for Australian Birds 2000*, S. Garnett *et al*, CSIRO, 2000.

²³ *Cranes, Herons & Storks of Australia*, D. Hollands, Bloomings, Melbourne, 2016.

²⁴ Birddata, viewed 23 May 2019.

²⁵ D. Hollands, *ibid*.

Provided measures proposed in the EES and endorsed by the IAC are implemented conscientiously, it is my assessment that impacts on Australasian Bittern should be minimal and acceptable.

Latham’s Snipe (*Gallinago hardwickii*)

Latham’s Snipe is a small migratory (trans-equatorial) wader which frequents freshwater wetlands, adjacent moist grasslands, vegetated drains and other suitable damp habitats²⁶. It breeds in the Northern Hemisphere and is rarely observed in Australia other than during the non-breeding season, although migrating individuals may arrive as early as August. Unlike many other migratory waders, it is not usually gregarious in its non-breeding range, although loose aggregations may occur in extensive areas of suitable habitat. It is frequently recorded from wetlands near the project.

Latham’s Snipe is listed as Migratory under the EPBC Act. Although it is not listed as threatened under the EPBC Act, it is listed as Near threatened in Victoria²⁷. The tendency for Latham’s Snipe to disperse widely once they arrive in Australia makes it difficult to prioritise sites as more important than others. The species apparently relies on being able to spread across extensive areas where habitat is available. Sites such as the wetland complex near the project should be treated as important habitat even without evidence of large gatherings of Latham’s Snipe being recorded.

The preference of the species for muddy substrates for foraging means it needs to be mobile in response to changing water levels during the spring-summer-early autumn when it is present in south-eastern Australia. Therefore, perhaps to a greater degree than other species of concern, it is likely to move between the different wetlands around the project as seasonal conditions vary. Unlike some other species it frequently flies quite high even over short distances.

As for other species discussed above, it is my assessment that impacts on Latham’s Snipe arising from construction and operation of the project are expected to be acceptable provided the mitigation measures proposed by MRPV and endorsed by the IAC are taken.

Australian Painted Snipe (*Rostratula australis*)

Australian Painted Snipe is a small Australian-breeding wader occurring at low densities in vegetated freshwater wetlands. It is listed as Endangered under the EPBC Act, with an estimated Australian population of about 2,500 following an apparent slight rebound after the drought-breaking wet years of 2010-2012²⁸. It has been adversely affected by draining of wetlands and by altered watering regimes in systems modified by water extraction. Its stronghold is eastern Australia, especially the east coast and the Murray-Darling Basin²⁹, but its movement patterns are poorly understood. The difficulty of access to much of its preferred habitat and its cryptic behaviour make it difficult to detect. The small number of documented records near the site may represent a more significant presence than first impressions might suggest.

Like other wetland species it is probable that Australian Painted Snipe when present would move between wetlands in the local complex as seasonal conditions vary. It could therefore be at risk from fragmentation of the habitat resulting from the construction and operation of a freeway between or across components of the complex. However, Australian Painted Snipe is known to use habitat in small, isolated urban wetlands at times. It is not a “true” snipe, and its flight tends to be more laboured and lower than Latham’s Snipe. Effective MFFBs may be important in reducing the risk of collision with traffic for individuals moving between wetlands in Braeside Park and Woodlands Industrial Estate.

²⁶ Menkhorst *et al*, *ibid*.

²⁷ DELWP Advisory List, 2013.

²⁸ EPBC Act listing advice, 2013.

²⁹ Menkhorst *et al*, *ibid*.

As for other species discussed above, it is my assessment that impacts on Australian Painted Snipe arising from construction and operation of the project are expected to be acceptable provided the mitigation measures proposed by MRPV and endorsed by the IAC are implemented.

A.4 Assessment

- Impacts to seasonal herbaceous wetlands (freshwater) and natural damp grassland threatened ecological communities are acceptable. However, the residual impacts may be considered enough to meet the significance thresholds and therefore EPBC offset requirements.
- Impacts to migratory birds do not meet significance thresholds and are considered acceptable.
- Impacts to threatened species do not meet significance thresholds and are considered acceptable.
- Indirect impact from noise and lighting to migratory birds is acceptable if undertaken in accordance with the EPRs, particularly with the IACs recommendation to make all MFFB 3m high.
- The predicted residual changes to the water level regime of the Edithvale Wetlands have the potential to be significant if not further mitigated. Hence, EPRs need to require that hydrological characteristics of the Edithvale Wetlands are maintained to within acceptable limits, such that risks to protected ecological values are minimised.
- Long term changes to water quality in the Edithvale and Waterways Wetlands should be positive or at worst insignificant, subject to successful ongoing implementation of mitigation measures.
- Given this relies upon long term effectiveness of bioretention systems, new EPR W7 is needed to require ongoing monitoring and maintenance.
- The risk to downstream water quality from spills will be addressed through EPR W1, amended to require these measures comply with relevant guidelines and standards.

Appendix B Environmental performance requirements

The IAC recommended specific changes to many of the EPRs that MRPV tabled in closing submissions at the IAC hearing. That version of the EPRs had itself developed from the EPRs published in the exhibited EES. I commend MRPV for the changes it proactively adopted in response to matters raised by submitters. I generally support the IAC's recommended version of each EPR except where qualified in the Minister's assessment column.

The table below lists MRPV's second version of the EPRs that it tabled at the IAC hearing in March 2019 and incorporates recommended changes from the IAC as [additions](#) and [deletions](#).

No.	EPR Version 2 as amended by the IAC	Minister's assessment
EM1	<p>Environmental Management Strategy</p> <p>Prepare an Environmental Management Strategy consistent with the Environmental Management Framework (EMF) approved by the Minister for Planning under the Incorporated Document applicable to the project. The Environmental Management Strategy is to demonstrate how the EMF and EPRs will be implemented in the design and construction of the project and is to be approved by the Major Transport Infrastructure Authority (MTIA) prior to the commencement of any works other than preparatory works referred to in the Incorporated Document.</p> <p>The Environmental Management Strategy must incorporate an Environmental Management System that complies with AS/NZS ISO 14001: 2015 <i>Environmental management systems – Requirements with guidance for use</i>.</p> <p>The approved Environmental Management Strategy must be made publicly available for at least five years after the commencement of operation of the project on a clearly identifiable website.</p>	<p>An Environmental Management Strategy (between the EMF and the other requirements of the EMF (e.g. CEMP, EMPs, EPRs)) has the potential to create an unnecessary layer and confusion. The EMF provides the authoritative framework for environmental governance and management for the project.</p> <p>This EPR should be removed or at the very least amended to clearly reflect this central and direct role of the EMF (rather than an EMS) in providing the framework for mitigating adverse effects and achieving environmental outcomes via the specified EPRs and core plans.</p>
EM2	<p>Environmental management plans</p> <p>Prepare and implement a Construction Environmental Management Plan (CEMP) and other management plans as required by the EPRs in accordance with the Environmental Management Strategy and prepare and implement an Operations Environmental Management Plan (OEMP) as required by the EPRs in accordance with the Environmental Management Framework. All plans must be prepared to the satisfaction of MTIA or the authority specified in the EPRs. Plans that apply to the operation phase of the project, including the OEMP, must be prepared in conjunction with VicRoads. All plans specified in the EPRs must be implemented.</p> <p>The CEMP must be prepared in accordance with Environment Protection Authority (EPA) Publication 480 <i>Environmental Guidelines for Major Construction Sites</i> (EPA Victoria 1996), EPA Publication 275 Construction Techniques for Sediment Pollution Control (EPA Victoria 275) and relevant best practice construction guidelines.</p> <p>The process for development and implementation of the CEMP</p>	<p>To be amended in line with my recommendation for EM1 above, thus ensuring the CEMP, OEMP and other core plans required through EPRs will be prepared in accordance with the approved EMF (not the Environmental Management Strategy).</p>

No.	EPR Version 2 as amended by the IAC	Minister’s assessment
	<p>and other management plan(s) must include consultation with the Kingston City Council, Greater Dandenong City Council, VicRoads, Melbourne Water and EPA Victoria as relevant. These consultation processes must be described in the Environmental Management Strategy. The CEMP and other management plan(s) must be integrated and must be approved by MTIA prior to the commencement of works (except for preparatory works referred to in the Incorporated Document). The OEMP must be approved by the MTIA prior to opening the project to the public.</p>	
EM3	<p>Environmental complaints management Prior to the commencement of works a process for recording, managing, and resolving complaints received from affected stakeholders must be developed and implemented. The complaints management arrangements must be consistent with Australian Standard <i>AS/NZS 10002: 2014 Guidelines for Complaint Management in Organisations</i>.</p>	
EM4	<p>Independent Reviewer and Environmental Auditor Appoint a suitably qualified Independent Reviewer and Environmental Auditor (IREA) to review and certify the Environment Management Strategy, CEMP and other management plans as required by the EPRs, in accordance with the Environmental Management Framework. During construction audit reports must be provided to MTIA and the Minister for Planning on a regular basis as appropriate. Audit reports are to be made available to the public.</p>	<p>To be amended in line with my recommendations above for EM1 and EM2, removing the reference to the environmental management strategy. The EPR should be specific about qualifications of the IREA, for example with reference to EPA’s appointed environmental auditor program and/ or the Environment institute of Australia and New Zealand’s Certified Environmental Practitioner program. The EPR should require all environmental audit reports to be made publicly accessible on a website (shortly after provision to MRPV).</p>
AQ1	<p>Air quality (operation) The project must be designed and constructed to minimise air quality impacts during operation and to ensure the requirements of relevant legislation, policies and guidelines are met, including but not limited to:</p> <ul style="list-style-type: none"> • State Environment Protection Policy (Air Quality Management) • State Environment Protection Policy (Ambient Air Quality). 	<p>This should encompass the requirements for appropriate operational monitoring, to obtain data in order to confirm model predictions and inform potential mitigation responses, particularly for NO₂.</p>
AQ2	<p>Air quality (construction) Measures to minimise dust, odour and other air emissions must be implemented in accordance with relevant legislation, policies and guidelines including, but not limited to:</p> <ul style="list-style-type: none"> • EPA Victoria Publication 480: Environmental Guidelines for Major Construction Sites; • VicRoads Contract Specification Standard Section 177, with PM10 monitoring undertaken for both residential and commercial receptors. 	<p>To include an air quality management plan, prepared in consultation with EPA, including real-time monitoring to manage dust control in response to adverse weather events in time to minimise impacts to sensitive receptors.</p>

No.	EPR Version 2 as amended by the IAC	Minister’s assessment
B1	<p data-bbox="252 365 408 387">Fauna habitat</p> <p data-bbox="252 394 919 517">Direct and indirect impacts on fauna must be minimised by preserving and enhancing habitat and facilitating habitat connectivity where practicable. This will be achieved through implementation of (as a minimum):</p> <ul data-bbox="252 528 957 2033" style="list-style-type: none"> <li data-bbox="252 528 957 685">• fauna crossings, including culverts modified for fauna movement between the Braeside Park Wetlands and Woodlands Industrial Estate Wetlands (minimum of 3 culverts), and between the Waterways wetland waterbodies south of Governor Road (minimum of 2 culverts) <li data-bbox="252 696 957 2033">• multi-function fauna barriers, to limit fauna mortality and limit disturbance to surrounding habitat, at the following areas, subject to detailed design: <ul data-bbox="284 797 957 1727" style="list-style-type: none"> <li data-bbox="284 797 957 954">- Braeside Park: on the east side of the new roadway, provision of a 2-3 metre high barrier extending from Lower Dandenong Road to Park Way, transitioning to a 3 metre high barrier to be provided from Park Way to Governor Road <li data-bbox="284 965 957 1122">- Woodlands Wetlands: on the west side of the new roadway, provision of a 4 metre high barrier extending from Park Way to the south approximately 750 metres, transitioning to a 3 metre high barrier to be provided from that location to Governor Road <li data-bbox="284 1133 957 1290">- Waterways Wetlands (north-west): on the west side of the new roadway, provision of a 2 metre high barrier extending from Governor Road to the south approximately 600 metres, transitioning to a 1 metre high barrier to be provided from that location to Bowen Park Way <li data-bbox="284 1301 957 1592">- Waterways Wetlands (north-east): on the east side of the new roadway, provision of a 2 metre high barrier extending from Governor Road to the south approximately 200 metres, transitioning to a 2.5 metre high barrier to be provided from that location to the south approximately 175 metres, transitioning to a 3 metre high barrier to be provided from that location to the south approximately 200 metres, transitioning to a 2.5 metre barrier to be provided from that location to Bowen Park Way <li data-bbox="284 1603 957 1727">- Waterways Wetlands (bridge structure): provision of a 3 metre high barrier on both sides of the new roadway bridge structure, extending from Bowen Park Way south to the Melbourne Water Levy <li data-bbox="252 1738 957 1861">• wildlife friendly fencing that does not use barbed wire, including to control human and dog access to Braeside Wetlands and Braeside Park from the shared user path or roadway <li data-bbox="252 1872 957 2033">• landscaping including: <ul data-bbox="284 1906 957 2033" style="list-style-type: none"> <li data-bbox="284 1906 957 1939">- the use of site-specific indigenous species <li data-bbox="284 1951 957 2033">- creating or revegetating habitat that maximises connectivity and minimises predation risk at fauna crossing points and under the constructed bridge over Waterways 	<p data-bbox="987 365 1430 421">Supported with the addition of design requirements to:</p> <ul data-bbox="987 432 1430 786" style="list-style-type: none"> <li data-bbox="987 432 1430 656">• integrate MFFB design with screening plantings selected and sited both to reduce the visual impact of the barriers viewed from outside the road and to encourage flying birds crossing the road to do so above traffic collision risk height; <li data-bbox="987 667 1430 786">• enable wildlife occupying adjacent habitat to continue to do so throughout the construction phase as far as practicable.

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	<p>Wetlands</p> <ul style="list-style-type: none"> - open wetland and grassy habitat where appropriate, including swales adjacent to fauna barriers - reinstatement of habitat in areas of the Waterways Wetlands disturbed by the project, including planting of wetlands species in accordance with the landscape plans (EPR LV1) • a dual bridge structure at Mordialloc Creek/Waterways Wetland to allow light penetration and facilitate fauna movement. <p>The multi-function fauna barriers <u>must be solid and free from gaps or cracks and must be constructed from a material</u> must <u>achieve with an</u> acoustic performance of at least $R_w + C_{tr} 25$.</p> <ul style="list-style-type: none"> • During detailed design and in consultation with a suitably qualified specialist ecologist, refine proposed height, form and materiality of the multi-function fauna barriers to optimise the achievement of bird flight diversion objectives without compromising the achievement of other objectives. 	
B2	<p>Lighting design</p> <p>Fauna sensitive lighting design principles must be incorporated into lighting design in sensitive areas around wetlands and Braeside Park. The design principles are:</p> <ul style="list-style-type: none"> • Siting of lights: <ul style="list-style-type: none"> - Use lights only where necessary and use the minimum brightness (lumens) possible - Site lighting columns away sites of ecological value to the extent possible - Minimise the height of lighting where possible. • Fixtures: <ul style="list-style-type: none"> - Use shielding to fully shield bulbs and lenses and to minimise light spill onto sites of ecological value - Avoid reflective surfaces under lights. • Wavelengths: <ul style="list-style-type: none"> - Use narrow-spectrum light sources to lower the range of species affected by lighting, and avoid blue and white wavelengths (4200 kelvin, ideally <3000 kelvin) - Use long wavelength bulbs to minimise the emission of UV light. 	<p>Create new EPR or amend this EPR to require MRPV and its contractors to adopt <i>best practicable measures</i> to avoid and minimise adverse impacts from construction on wildlife using habitat adjacent to the project.</p>
B3	<p>Native vegetation and habitat</p> <p>Native vegetation removal must be avoided, minimised and managed in accordance with the <i>Guidelines for the removal, destruction or lopping of native vegetation 2017</i> (Guidelines 2017). Native vegetation offsets will be required for the removal of native vegetation, with the area (in hectares) to be calculated and approved in accordance with these guidelines.</p> <p>No-go zones will be established to protect sensitive vegetation, trees and habitat areas that are not removed in accordance with the Guidelines 2017. No-go zones will be detailed, protected and</p>	<p>Offsets required after application of the Avoid Minimise Offset hierarchy should be chosen to integrate as much as possible with any offset requirements under the EPBC Act.</p> <p>No-go zones should be definitively mapped in the CEMP, consistent with commitments in the EES and with the recommendations of this assessment.</p>

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	<p>managed in accordance the requirements set out in AS4970-2009 Protection of Trees on Development Sites and with the Environmental Management Strategy developed as per EPR EM1.</p>	
B4	<p>Fauna (construction) Minimise, monitor and document impacts on fauna during construction works, including:</p> <ul style="list-style-type: none"> • obtaining all relevant permits under the Wildlife Act 1975 • pre-clearing fauna surveys and relocation of fauna by qualified fauna handlers to nearby suitable habitat • directional temporary construction lighting to minimise lighting impact on sensitive fauna habitat • noise and vibration impacts on sensitive fauna • if construction works near wetlands occur between September and March, monitoring of birds before and at regular intervals during construction to assess disturbance impacts, with minimisation of noisy and high disturbance works where practicable • regular inspections of excavations/trenches • restricting excluding heavy construction vehicles along Edithvale Road near sensitive habitats • adding identified high value habitat trees (including hollow-bearing and large trees) into no-go zones where suitable • closure of excavations/trenches at the end of each day, where practicable, inspection of excavation/trenches for fauna at the start of each day and immediately before backfilling • minimise barriers to fauna movement at the end of each day and installation of fauna movement devices where effective to create safe crossing opportunities • enforced speed limits of 40km per hour within construction areas, outside of existing arterial roads. 	
B5	<p>Native vegetation (construction) Monitor, minimise and document impacts on retained/adjacent native vegetation, including:</p> <ul style="list-style-type: none"> • pre-clearing surveys for threatened flora in the Mordialloc Creek/Waterways wetland impact area are to be conducted by a suitably qualified ecologist, and plants are to be relocated to a suitable recipient site where considered practicable by the ecologist • mapping and fencing of no-go zones and tree protection zones in accordance with AS4970-2009 Protection of Trees on Development Sites • no site compound, temporary offices, hardstand, plant storage facility or stockpiles will be established within no-go zones, nor will any works be conducted in such areas • environmental induction/training for construction personnel • development and implementation of weed hygiene measures 	<p>Amend to ensure any revegetation or replanting within listed threatened ecological communities should use species consistent with the communities’ composition as far as practicable.</p>

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	<p>to avoid the spread or introduction of weeds during construction, including vehicle and equipment hygiene measures</p> <ul style="list-style-type: none"> as far as practicable, re-establishing the landform and substrate under the Mordialloc Creek bridge following bridge construction, including revegetation using shade tolerant aquatic species. 	
B6	<p>Flora and Fauna (operation)</p> <p>Prior to opening the project to the public, a Flora and Fauna Monitoring and Management Plan must be prepared in consultation with Department of Environment and Energy (DoEE), Department of Environment, Land, Water and Planning (DELWP), Melbourne Water, Parks Victoria, VicRoads and any other relevant land manager. The plan must include flora and fauna monitoring by ecologists after opening, including:</p> <ul style="list-style-type: none"> annually, for 5 years, including one monitoring event immediately prior to opening monitoring of bird use of nearby wetlands (Woodlands Wetlands, Braeside Park Wetlands, and Waterways Wetlands) and threatened flora and weeds at the Waterways Wetlands Design, implement and maintain an Aquatic Flora and Fauna Ecosystem Reinstatement and Maintenance Plan for the Waterways Wetlands ecological habitat. monitoring of measures to allow habitat connectivity for threatened fauna including Waterways bridge, fauna culverts, and revegetation evaluation of measures (fencing and multi-function fauna barriers) to reduce wildlife and vehicle collisions. 	<p>The Plan should provide for monitoring to continue for a longer initial period than five years but make provision for monitoring to be discontinued earlier with the agreement of DELWP if results show that impacts have stabilised to acceptable levels within limits predicted in the EES.</p> <p>In addition to monitoring immediately prior to opening, available database information should be taken into account for benchmarking.</p>
CL1	<p>Soil Management Plan</p> <p>Prior to the commencement of works (other than preparatory works referred to in the Incorporated Document), a Soil Management Plan (SMP) must be prepared and implemented in accordance with relevant regulations, standards and best practice guidelines including the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended in 2013. The plan must be developed in consultation with EPA Victoria and address the management requirements associated with the handling, storage, reuse and/or disposal of soils (clean fill and contaminated spoil) and comply with EPA Victoria’s contaminated soil management and reuse on major infrastructure projects approvals process.</p> <p>The SMP must make provision for additional assessments to be conducted, where required, to more accurately locate sources of contamination and to refine management measures. Investigations must be undertaken in accordance with EPA Publication 702 (Soil Sampling).</p> <p>The SMP must follow published EPA guidance on contaminated soil management and reuse on major infrastructure projects.</p>	

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	The SMP must include an Acid Sulphate Soil Management Plan (EPR CL2) and management requirements for PFAS contaminated soils (see EPR CL6).	
CL2	<p>Acid Sulphate Soil Management Plan</p> <p>Prior to the commencement of works (other than preparatory works referred to in the Incorporated Document), prepare an Acid Sulphate Soil Management Plan in consultation with EPA Victoria in accordance with the <i>Industrial Waste Management Policy (Waste Acid Sulphate Soils) 1999</i>, EPA Publication 655.1 <i>Acid Sulphate Soil and Rock</i>, and relevant EPA regulations, standards and best practice guidance. This plan must include:</p> <ul style="list-style-type: none"> • locations and extent of potential acid sulphate soils that could be disturbed or otherwise affected by the project, including site-specific information for areas at risk • assessment of potential impact on human health, odour and the environment • measures to prevent oxidation of acid sulphate soils wherever possible, and • suitable sites for management, reuse or disposal of acid sulphate soils with regard to sensitive receptors (wetlands, waterways and residential areas). 	
CL3	<p>Passive landfill gas capture and venting</p> <p>A passive landfill gas capture and ventilation system must be developed where the roadway traverses the landfill area to facilitate the emission of landfill gas to the atmosphere so as to minimise accumulation of landfill gas below the roadway.</p> <p>The passive landfill gas capture and ventilation system must:</p> <ul style="list-style-type: none"> • be designed in conjunction with VicRoads and EPA Victoria; • meet the landfill gas management requirements of the EPA’s guideline Best Practice Environmental Management: Siting, design, operation and rehabilitation of landfills (EPA Victoria 2015) and Workplace Exposure Standards for Airborne Contaminants (Safe Work 2013). • be reviewed and approved by the IREA established under EPR EM4. <p>During design, provision must be made for gas protection measures to be provided at all underground services, pits and other voids within the road reserve in locations where landfill gas is emitted, or to which it has the potential to migrate to.</p> <p>The passive landfill gas capture and ventilation system(s) must be maintained for the operational life of the project except where otherwise agreed to by EPA Victoria.</p>	
CL4	<p>Landfill Gas Management Plan (Construction)</p> <p>Prior to the commencement of works (other than preparatory works referred to in the Incorporated Document), a Landfill Gas Management Plan (Construction) must be prepared (EPR EM2). The plan must be developed in consultation with EPA Victoria and in accordance with relevant regulations, standards and best</p>	

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	<p>practice guidelines including, but not limited to, <i>Best Practice Environmental Management: Siting, design, operation and rehabilitation of landfills</i> (EPA Victoria 2015) and <i>Workplace Exposure Standards for Airborne Contaminants</i> (Safe Work 2013).</p> <p>The plan must detail specific monitoring and risk mitigation requirements that are to be implemented during the construction phase to reduce landfill gas- related risks to neighbouring land users, site workers, plant and equipment.</p> <p>The Landfill Gas Management Plan must:</p> <ul style="list-style-type: none"> • reference applicable regulatory requirements • detail the nature and extent of contamination • include details of design and construction requirements for passive landfill gas and venting systems • define roles and responsibilities • detail landfill gas monitoring and reporting requirements • include monitoring requirements for explosive atmospheres and fire risks during construction • include guidelines for work areas which constitute confined spaces, and • include requirements for use of spark and flame emitting equipment, tools or plant during construction works. 	
CL5	<p>Landfill Gas Management Plan (Operation)</p> <p>Prior to the completion of construction of the passive landfill gas capture and venting system (EPR CL3) a monitoring and management program for surface, sub-surface and internal/underground voids, pits and service trenches will be specified within a Landfill Gas Management Plan (Operation). The plan must be developed in consultation with EPA Victoria and assess ongoing risk associated with landfill gas generated by the former landfill(s) in the northern portion of the project area.</p> <p>The plan must outline procedures for any future works within the project area, means of protection of in-ground gas protection/mitigation systems and monitoring and management requirements.</p>	
CL6	<p>PFAS Management Plan</p> <p>Prior to the commencement of works (other than preparatory works referred to in the Incorporated Document), a site-specific PFAS management plan must be prepared in consultation with EPA Victoria in accordance with EPA Publication 1669.2 <i>Interim position statement on PFAS</i> (EPA Victoria 2018) and the Heads of EPAs Australia and New Zealand <i>PFAS National Environmental Management Plan</i> (PFAS NEMP) (HEPA2018).</p>	
CL7	<p>Landfill material</p> <p>Structures that penetrate the landfill must be designed and constructed to avoid the creation of additional pathways for contaminants to move from leachate to surrounding groundwater and minimise the need for landfill material to be</p>	

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		<p>removed, to the satisfaction of the EPA.</p> <p>The structures must be designed to avoid impacts on groundwater flows and groundwater quality, including consideration of vertical hydraulic gradients and lateral spread of contamination taking into account the direction of groundwater flow.</p>
E1	<p>Business Disruption Plan</p> <p>During design and construction, impacts on local businesses must be minimised through the preparation and implementation of a Business Disruption Plan. The Business Disruption Plan will be consistent with an approved Community and Stakeholder Engagement Management Plan (EPR S1) and include:</p> <ul style="list-style-type: none"> • transport planning prior to road closures to minimise impacts on business access and parking (EPR T1) • a process for communication with traders and businesses • management of potential amenity impacts during construction and operation (EPR AQ1, AQ2, NV2, and NV3). 	
E2	<p>Utility assets</p> <p>Through detailed design and construction, the impacts on utility assets must be minimised to the extent practicable including, but not limited to:</p> <ul style="list-style-type: none"> • stormwater and sewer assets • electricity transmission assets (overhead and underground lines) • gas and fuel pipelines • communications lines (e.g. fibre optic cables). <p>If relocations are required to facilitate the project, utility assets must be protected and, where required, modified to the satisfaction of the asset owners.</p>	
GG1	<p>Greenhouse gas monitoring and reporting</p> <p>Minimise and manage greenhouse gas emissions (GHG) arising from construction, operation and maintenance through the integration of sustainable design practices.</p> <p>Create a Sustainability Management Plan (SMP) which includes mandatory actions to monitor and report construction phase greenhouse gas emissions and to benchmark predicted operational phase greenhouse emissions in accordance with Mat-1 and Ene-1 credits of the Infrastructure Sustainability (IS) rating tool (v1.2).</p>	
GG2	<p>Emissions reduction</p> <p>The materials and equipment for the project must be selected with the intent to reduce the project associated GHG emissions during the construction and operational phases.</p> <p>A verifiable improvement in project GHG emissions must be achieved by achieving a minimum of Mat-1 (Level 1) and Ene-1 (Level 2) credits of the Infrastructure Sustainability (IS) rating</p>	

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	<p>tool (v1.2).</p> <p>A minimum of 20% of construction phase energy must be purchased from an accredited GreenPower product.</p>	
H1	<p>Cultural Heritage Management Plan</p> <p>Comply with and implement the Cultural Heritage Management Plan (CHMP) approved under the <i>Aboriginal Heritage Act 2006</i>.</p>	
H2	<p>Unidentified non-Aboriginal historical archaeological sites</p> <p>An archaeological discovery protocol must be prepared that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the <i>Heritage Act 2017</i> and must be developed in consultation with Heritage Victoria. The protocol must include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the remains or artefact, and dealing with the remains or artefact in accordance with the consent.</p>	
H3	<p>Non-Aboriginal heritage sites</p> <p>The project must be designed to avoid damage to the Braeside Park Precinct brick buildings.</p> <p>Prior to the commencement of works that have the potential to impact on heritage structures or places, appropriate heritage protection plans must be developed for inclusion in the CEMP and physical protection measures must be implemented to avoid or mitigate potential impacts to the heritage items within the revised Heritage Overlay.</p>	<p>This wording will need to reflect the proposed deferment of the amendments to the Heritage Overlay which were included in the proposed draft planning scheme amendment.</p>
LV1	<p>Landscape and urban design</p> <p>Landscape and urban design plans must be developed prior to the commencement of works (other than preparatory works referred to in the Incorporated Document) and must respond to or be based on relevant standards and the best practice principles of the:</p> <ul style="list-style-type: none"> • <i>Landscape Concept Plan</i> (VicRoads, August 2018) and <i>Landscape and Urban Design Strategy</i> (Aspect Studios, September 2018) for the project • <i>Good Design Principles - Transport</i> (OVGA 2015) • <i>Urban Design Charter for Victoria</i>, and • <i>Urban Design Guidelines for Victoria</i> (DELWP 2017). <p>The landscape and urban design plans must be prepared by suitably qualified professionals in consultation with relevant stakeholders, including Kingston City Council, and must incorporate, where practicable, high quality integrated mitigation measures to minimise the landscape and visual impact associated with the project, including in respect of:</p> <ul style="list-style-type: none"> • open spaces and recreational spaces • bridges and structures 	<p>Add references to use of appropriate vegetation screening for MFFBs (integrated with EPR B1) and avoidance of planting vegetation which might compromise the integrity of listed threatened ecological communities.</p> <p>As this EPR has a relationship with other EPR objectives and outcomes (such as for noise and biodiversity), its final form will need to have regard to any relevant landscape related measures being used to meet these other EPRs. This interface and influence on urban design outcomes will need to be carefully managed by MRPV and the contractor.</p>

No.	EPR Version 2 as amended by the IAC	Minister’s assessment
	<ul style="list-style-type: none"> significant views from the public domain community facilities residential interfaces industrial interfaces, and heritage assets. <p>The landscape and urban design plans must:</p> <ul style="list-style-type: none"> include vegetation screening appropriate for visually impacted community spaces, including residential areas and public open spaces in high traffic areas and at sensitive interfaces make use of mature tree stock (<i>15 litre</i>) where appropriate in combination with tube stock and advanced tree plantings to reduce the initial visual impacts denser planting of a 15 metre wide band of trees (small and medium size) at areas where residences are within 35 metres of the roadway. ensure that visually apparent elements (including acoustic and other barriers, bridges and abutments) are the subject of an integrated landscape and urban design process minimise overshadowing by acoustic barriers of residential properties utilise colours and materials derived from the existing landscape and ecological environment make use of appropriate ecologically sensitive indigenous planting consider existing landscape character and sensitivities enhance key gateway streetscapes maintain and enhance existing pedestrian connections, where practicable, and ensure that the underpass at Braeside Park achieves best practice urban design principles be developed in consultation with appropriate Traditional Owner groups to provide direction on appropriate landscape typologies, land management practices and principles, and incorporate requirements of EPR LV2 and EPR LV3. <p>Landscape and urban design for the project in accordance with the landscape and urban design plans must be implemented and maintained (EPR LV7).</p>	
LV2	<p>Crime prevention through environmental design</p> <p>Landscape and urban design plans must protect and, where practicable, improve access to, and amenity for, potentially affected residents, open spaces, pedestrian and cyclist networks, social and community infrastructure and commercial facilities, whilst meeting the requirements of EPR B2. This includes implementing the principles and guidelines of <i>Crime Prevention Through Environmental Design</i> (CPTED) and <i>Urban Design Guidelines for Victoria</i> (DELWP 2017) and maximising passive surveillance levels as far as practicable.</p>	
LV3	<p>Reinstatement works</p>	

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	Within 12 months of the commencement of operation, the public open spaces, vegetation cover and facilities disturbed by temporary works must be reinstated to the reasonable satisfaction of the relevant land manager.	
LV4	Lighting (operation) All lighting of permanent structures must be designed to minimise light spillage and protect the amenity of adjacent land uses to the extent practicable. Lighting in sensitive areas around wetlands and Braeside Park must also comply with EPR B2.	
LV5	Light spillage (construction) All lighting during construction must be managed in such a way as to minimise light spill to surrounding residential land uses, sensitive areas including wetlands and Braeside Park, and neighbourhoods. The strategies and techniques to do so must be included in the CEMP.	
LV6	Tree removal Minimise the removal of mature trees, particularly large amenity trees and those within or connected to public open spaces, that are not currently protected by no-go zones as described in EPR B3..	
LV7	Landscape management strategy A landscape management strategy must be developed and implemented to ensure healthy growth of planted vegetation. The strategy will include watering and weed management and include a monitoring program . <ul style="list-style-type: none"> • The plan must ensure the reinstatement of soils is of sufficient quality and volumes to support the long-term viability of replacement plantings. Ensure ongoing supply of water to tree root zones, especially during their establishment stage. Employ water sensitive urban design principles (WSUD) where possible. • The plan must specify the locations where installations of advanced trees are indicated to minimise impact of tree removal. The plan must identify locations for planting prior to construction works where feasible to do so.	
LV8	Independent urban design review panel A suitably qualified Independent Urban Design Review Panel Advisor must be appointed for the project by MTIA. The landscape and urban design plans and Landscape Management Strategy must be referred to the Independent Urban Design Review Panel Advisor for review against the relevant EPRs and project objectives.	The IUDRP is supported but its scope is unclear in this EPR, as review is a broad term. Hence, I recommend this EPR be amended to outline the program and authority of the IUDRP within the design and review process.
NV1	Noise and vibration (design) Noise and vibration impacts on residents during operation must be minimised by the inclusion of appropriate noise attenuation measures and road surface specifications in the design. Road	EPR is include the requirement to limit noise exposure to +12 dB(A) for receivers with an existing ambient noise level of less than 50 dB(A) _{L₁₀,18hour} .

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	<p>traffic noise emissions must comply with the <i>Project Objective Noise Levels</i>:</p> <ul style="list-style-type: none"> • 63dBA L10, 18Hr for the new bypass, and • 68dBA L10, 18Hr for the Mornington Peninsula Freeway works • For noise-sensitive receivers as defined in the VicRoads Traffic Noise Reduction Policy. <p>Design year 2031 must be used for the purpose of traffic noise modelling as part of the detailed design development.</p>	<p>Given this assessment recommends some further noise attenuation, there is some uncertainty regarding the residual visual impact that could result from further noise attenuation, should it involve higher noise walls (either solely or as part of the additional noise attenuation). During detailed design, MRPV must carefully balance noise and visual amenity EPRs to minimise the impacts of the projects sights and sounds on surrounding residents.</p>
NV2	<p>Construction Noise and Vibration Management Plan</p> <p>A Construction Noise and Vibration Management Plan (CNVMP) prepared in consultation with EPA Victoria must be implemented during construction to:</p> <ul style="list-style-type: none"> • manage noise in accordance with EPA Publication 1254 Noise Control Guidelines, EPA Publication 480 Environmental guidelines for major construction sites and VicRoads Noise Guidelines, unless otherwise specified in the CNVMP • include measures to manage vibration in accordance with human response to vibration targets (BS 6472 Evaluation of human exposure to vibration in buildings (1–80Hz)) and structural damage targets (DIN 4150 Structural vibration - Effects of vibration on structures). <p>The CNVMP must include requirements for substituting high noise or vibration construction plant or processes with a lower noise or vibration option. The CNVMP must make provision for <i>ad hoc</i>, targeted and routine noise and vibration monitoring to inform management and mitigation. The CNVMP should highlight potential unavoidable night works and consult with relevant stakeholders, including EPA, prior to construction.</p> <p>The CNVMP must include construction noise targets for residential and non-residential receivers to enable a quantitative assessment of construction noise impacts to be undertaken. The targets should be developed in consultation with the EPA. Construction noise targets for day, evening and night-time activities should be specified. If construction noise is predicted to or does exceed the targets then management actions as specified in the CNVMP must be implemented.</p>	
NV3	<p>Traffic noise verification</p> <p>Traffic noise must be measured between 6 to 12 months after opening of the project, in accordance with the VicRoads <i>Traffic Noise Measurement Requirements for Acoustic Consultants – September 2011</i>, to verify conformance with the external traffic noise performance requirements set out in EPR NV1. Remedial action must be completed by Final Completion (at the completion of the Defects Liability Period) if the performance requirements set out in EPR NV1 are not met</p>	

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S1	<p data-bbox="252 365 767 387">Community and Stakeholder Engagement Plan</p> <p data-bbox="252 398 954 651">A Community and Stakeholder Engagement Plan must be prepared in consultation with Kingston City Council and Greater Dandenong City Council prior to the commencement of works (other than preparatory works referred to in the Incorporated Document). The preparation of the plan must give consideration to relevant guidelines and the Victorian Auditor General Office: <i>Better Practice Guide: Public Participation in Government Decision Making</i>.</p> <p data-bbox="252 663 871 685">The Community and Stakeholder Engagement Plan must:</p> <ul data-bbox="252 696 954 1637" style="list-style-type: none"> <li data-bbox="252 696 954 819">• identify all project activities that potentially impact on community, land owners and business operations, and provide for well-coordinated communication and engagement processes in relation to each activity <li data-bbox="252 831 512 853">• outline key messages <li data-bbox="252 864 954 931">• ensure that project communications and engagement activities reflect the needs and profiles of local communities <li data-bbox="252 943 954 1066">• ensure that consultation addresses the needs of vulnerable groups that will be impacted by the project, such as the elderly, socio-economically disadvantaged groups and children <li data-bbox="252 1077 954 1144">• address the needs of users of community facilities impacted by the project <li data-bbox="252 1155 954 1402">• set out processes and measures to provide sufficient prior notice to key stakeholders and other potentially affected stakeholders of construction activities (including any staged works, early works, or out of hours works), significant milestones, changed traffic conditions, interruptions to utility services, changed access and parking conditions, and periods of predicted high noise and vibration activities, including contact details for complaints and enquiries <li data-bbox="252 1413 954 1570">• provide for any interested stakeholder to register their contact details to ensure that they are automatically advised of planned construction activities, project progress, mitigation measures and intended reinstatement measures, where applicable <li data-bbox="252 1581 954 1637">• include a complaints management process, as specified in EPR EM3. 	
S2	<p data-bbox="252 1675 491 1697">Recreational facilities</p> <p data-bbox="252 1709 954 1933">Where construction works have a direct impact on the use and enjoyment of recreational facilities, appropriate management measures must be implemented in cooperation with the relevant land manager(s) and affected stakeholder organisations. These measures would include arrangements for the provision of alternative facilities, where required, for the period of disruption.</p>	

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T1	<p>Intersection and freeway design and performance</p> <p>Intersections and freeway facilities that are affected and/or proposed by the project will be designed and constructed to provide safe vehicle movements to the satisfaction of the responsible road management authority. The design of intersections and the freeway must meet VicRoads’ design standards with analysis undertaken to ensure the proposed configuration will achieve acceptable operational performance.</p> <p>Road Safety Audits and/or Safe System Assessment in accordance with Austroads guidelines will be undertaken to maximise the safety potential of the project.</p>	
T2	<p>Transport Management Plan</p> <p>Prior to the commencement of works, TMP(s) must be developed and implemented to minimise disruption(to the extent practicable) to affected local land uses, traffic, on-road public transport, pedestrian and bicycle movements and existing public facilities during all stages of construction. The plan(s) will comply with relevant standards and must be developed in consultation with Kingston City Council, Greater Dandenong City Council, VicRoads and public transport providers and be informed and supported by an appropriate level of transport analysis.</p> <p>The plan(s) must include:</p> <ul style="list-style-type: none"> • a program to monitor impacts of construction activities to all modes of active and passive transport. Where monitoring identifies adverse impacts, practicable mitigation measures must be developed and implemented • consideration of cumulative impacts of other major projects operating concurrently in the local area • identify the route options for construction vehicles (including haulage of spoil and other heavy materials to and from the construction site) travelling to and from the project construction site, recognising sensitive receptors, and minimising the use of local streets prioritising the use of arterial roads • development of suitable measures to ensure emergency service access is not inhibited as a result of project construction activities (in consultation with emergency services) • provision for the minimisation of impacts on existing connectivity for pedestrians, cyclists, public transport and road vehicles as a result of construction, including the identification of alternative routes for pedestrians and cyclists and other measures to maintain connectivity and safety for pedestrians and cyclists • management of any temporary or partial closure of roads and traffic lanes, including provision for suitable routes for vehicles, cyclists and pedestrians, to maintain connectivity for road and footpath users • restrictions to the number of local roads to be used for 	

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	<p>construction-related transportation to minimise impacts on amenity, in consultation with the relevant road authorities, including at Edithvale Road (EPR B4)</p> <ul style="list-style-type: none"> • reinstatement of access to open space, community facilities, commercial premises and dwellings if disrupted, as soon as practicable, and to an equivalent standard • provision for safe access points to laydown areas and site compounds • construction hours to be weekdays between 7am and 7pm • a communications strategy to advise affected users, potentially affected users, relevant stakeholders and the relevant road authorities of any changes to transport conditions in accordance with the Community and Stakeholder Engagement Management Plan (EPR S1). <p>The plan must include specific measures for discrete components or stages of the works having the potential to impact on roads, shared use paths, bicycle paths, footpaths or public transport infrastructure.</p>	
T3	<p>Vehicle and pedestrian access</p> <p>Where formal vehicle and pedestrian access are altered during construction, such access must be replaced in accordance with relevant road design standards, as soon as practicable.</p>	
T4		<p>New EPR to specify the implementation of an appropriate monitoring program to measure actual traffic volumes and road performance relative to model predictions presented in the EES.</p>
W1	<p>Water body health</p> <p>During design, construction and operation, impacts on surface water quality and flow must be minimised through adoption of measures to:</p> <ul style="list-style-type: none"> • minimise changes in water flows and adverse changes in water quality to and within adjacent wetland areas; and • avoid an increase in discharge of pollutant loading (to higher than existing conditions levels) on beneficial uses due to the construction and operation of the project in accordance with CSIRO Best Practice Environmental Management Guidelines for Urban Stormwater (1999) and Water Sensitive Road Design (WSRD). <p>In addition, the project must incorporate spill containment at the outfalls which pose a high risk to sensitive receptors, including Waterways Wetlands, Woodlands Wetlands and Edithvale Wetlands and the waterway system including Mordialloc Creek. The spill containment must be designed, implemented and maintained in accordance with relevant guidelines and standards.</p> <p>Design specific maintenance requirements relating to water body health, (that do not form part of standard VicRoads maintenance requirements), must be included in the Water</p>	<p>This EPR should also specify that design and mitigation measures are used to ensure the hydrological characteristics of the Edithvale Wetlands are maintained to within acceptable limits, to minimise risk to its ecological values. Mitigation measures should include the provision of adequate on reservation retention capacity for stormwater from the impervious surfaces associated with the freeway, so that resultant increases in water entering the Edithvale Wetlands are appropriately reduced and attenuated.</p> <p>The design of surface water control measures for the project should be in consultation with Melbourne Water as the manager of the Edithvale Wetlands Ramsar site.</p>

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	<p>Asset Management Plan (EPR W7).</p> <p>The design of surface water control measures for the project as a whole must comply with the VicRoads <i>Integrated Water Management Guidelines (2013)</i> and CSIRO <i>Best Practice Environmental Management Guidelines for Urban Stormwater (1999)</i>.</p>	
W2	<p>Flood protection (operation)</p> <p>Changes to flood behaviour resulting from the project must meet the requirements of Melbourne Water’s guideline “<i>Melbourne Water standards for infrastructure in flood prone areas</i>” to the satisfaction of Melbourne Water.</p> <p>The Project design must minimise the risk of catastrophic flooding in the event of a flood larger than the 1% per cent AEP design flood or blockage.</p> <p>Design-specific maintenance requirements relating to floodwater, and that do not form part of standard VicRoads maintenance requirements, must be included in the Water Asset Management and Monitoring Plan (EPR W57).</p>	
W3	<p>Surface water management (construction)</p> <p>Protect local waterways and wetlands by applying best practice sedimentation and pollution control measures in accordance with EPA Victoria publication 480 <i>Environmental Guidelines for Major Construction Sites</i> and EPA publication 275 <i>Construction techniques for sediment pollution control</i> through the Construction Environmental Management Plan(s) and other plans. Implement a water collection and treatment system to ensure that stormwater discharges comply with the State Environment Protection Policy (Waters) 2018 and Melbourne Water performance criteria. Such plans and systems should be prepared in consultation with relevant authorities before the commencement of works.</p>	
W4	<p>Flood protection (construction)</p> <p>During construction, the requirements of the “<i>Melbourne Water standards for infrastructure in flood prone areas</i>” must be complied with. Measures must be implemented to the satisfaction of Melbourne Water and in consultation with any other relevant drainage authority, to ensure that temporary construction activities do not increase flood risks (including flood levels, flows and velocities) to the surrounding areas. A flood management plan must be developed in consultation with and not objected by Melbourne Water for any temporary works.</p>	
W5	<p>Water Management and Monitoring Plan</p> <p>A Water Management and Monitoring Plan (WMMP) must be prepared in consultation with EPA Victoria and relevant water authorities, and be implemented prior to construction, during construction and for five years following opening the project to the public. The WMMP must incorporate both surface and groundwater monitoring.</p> <p>Monitoring should commence prior to the commencement of</p>	

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	<p>works (other than preparatory works referred to in the Incorporated Document) to establish baseline conditions.</p> <p>The WMMP must incorporate baseline data collected to date and additional baseline data as required to address key issues including impacts of embankments and piling on groundwater.</p> <p>Incorporating the baseline data, the WMMP must include:</p> <ul style="list-style-type: none"> • detail of the monitoring parameters, including the frequency and location of surface water monitoring points and groundwater monitoring bores • monitoring parameters should include, but not be limited to, sediment, nutrients and toxicants • specific trigger levels (water quality in surface water bodies and groundwater bores) and details of contingency plans in the case trigger levels are exceeded • detailed reporting requirements • roles and responsibilities, not limited to: <ul style="list-style-type: none"> - the owner of monitoring network assets - the manager of monitoring network assets and results - the party (or parties) undertaking monitoring (prior to construction, during construction and for five years following opening). <p>The groundwater component of the WMMP must include assessment and, if necessary, mitigation of the following impacts:</p> <ul style="list-style-type: none"> • the impact of the embankments on groundwater levels, flow and quality • the impact of piling on groundwater levels, flows and quality. 	
W6	<p>Surface water management (design and operation)</p> <p>The volume, peak flow and quality of surface water discharges during operation must have no adverse impact to the drainage network capacities in consultation with Melbourne Water, Kingston City Council and Greater Dandenong City Council, as appropriate.</p>	
W7	<p>Water Asset Management Plan (Operation)</p> <p>Prior to completion of construction, an Asset Management Plan must be established to ensure the ongoing effectiveness of works to mitigate impacts on surface water, including drainage culverts and bioretention systems.</p> <p>The plan must specify requirements in relation to management, monitoring and reporting.</p>	