4 EES assessment framework and approach

Tables

Figures

4.1 OVERVIEW

This chapter describes how this Environment Effects Statement (EES) has been prepared, including the approach adopted for assessing the potential environmental effects of the proposed Mordialloc Bypass (Freeway) (the project). It also explains how risks and impacts have been assessed and how the Environmental Management Framework (EMF) for the project was prepared.

The assessment framework for this EES responds to the EES Scoping Requirements issued by the Minister for Planning in May 2018 and has also been informed by:

- Major Road Projects Authority's (MRPAs) project objectives (outlined in Chapter 1: *Introduction*)
- the EES evaluation objectives outlined in the *Scoping Requirements for Mordialloc Bypass EES* (DELWP 2018)
- the objectives and requirements of relevant legislation, guidelines and policies.

In evaluating the project's potential environmental risks and impacts, the assessment of the project followed the following process:

- an existing conditions assessment
- review of the project design and description
- completion of an assessment of initial risks and potential effects on identified environmental assets, including standard controls based on compliance with legislation and standard requirements typically incorporated into the delivery of construction contracts for road projects
- consultation with stakeholders, including government agencies through the technical reference group (TRG) and the community
- identification of mitigation (also referred to as additional controls) to reduce the initial risks and effects identified
- reassessment of risks and effects on the environmental assets based on incorporation of mitigation (additional controls) to determine the residual risks and effects
- assessment of cumulative impacts that could result from the project in combination with surrounding projects
- development of environmental performance requirements (EPRs) to set acceptable environmental outcomes required for the project (linked to the proposed additional controls) and provide a clear framework for management of environmental effects
- incorporation of the EPRs into the EMF for the project (Chapter 23: *Environmental management framework*).

The approach taken was consistent with the systems and risk-based approach discussed in the *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978* (DSE, seventh edition 2006). The steps above are discussed in this chapter, including how they work together to provide a comprehensive assessment. The EES assessment process is illustrated in Figure 4.1.

ENVIRONMENTAL ASSETS

Environmental assets within and surrounding the project area were determined through desk -based and field surveys of the existing conditions. The EES reports on the potential for significant adverse effects on individual environmental assets, taking into account the magnitude, geographic extent and duration of changes in the values of each asset.

Relevant environmental assets for the project are reflected in the EES technical chapters, including:

- road traffic and safety
- surface water and groundwater quality and flows
- residential amenity and access
- soil and geo-technical conditions
- native vegetation types and cover
- recorded flora and fauna
- known cultural heritage sites and areas of archaeological sensitivity
- landscapes and visual amenity
- air quality and noise
- land use and infrastructure.

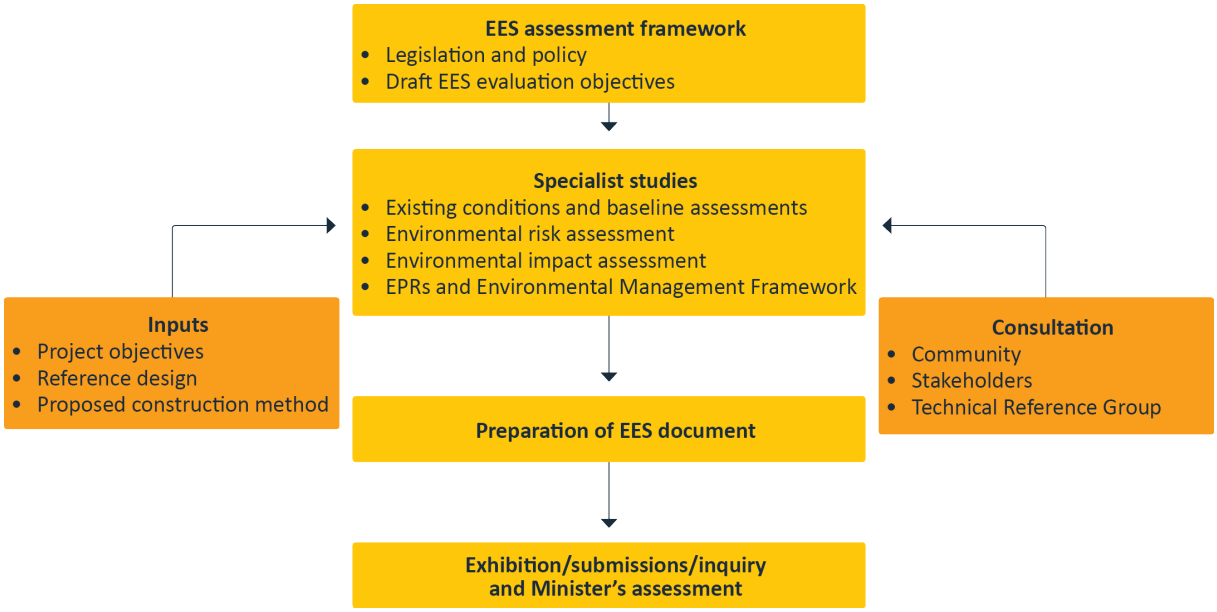

Figure 4.1 EES assessment process

4.2 EES ASSESSMENT APPROACH

The environmental studies undertaken by specialists for the EES included:

- existing conditions assessment
- ERA (including residual risks)
- impact assessment and mitigation (including residual impacts)
- cumulative impact assessment and mitigation
- development of EPRs.

The approach is illustrated in Figure 4.2 and discussed in the following sections.

A total of 13 specialist studies were undertaken to address all items identified in the scoping requirements. The specialist studies are summarised in the discipline-specific chapters of this EES (Chapters 8 to 20) and the impact assessment reports are appended to this EES as appendices (see list in Chapter 1: *Introduction*).

Prior to determining existing conditions and setting a baseline for the assessment, it was necessary to define the appropriate boundaries including the project area and study areas which can vary for different technical disciplines. The project area is defined as the area within which the project would be implemented and relates to the right-of-way for the project, as described and illustrated in Chapter 6: *Project description*. The study area includes the surrounding environs that could be affected by the project's construction and/or operation and is defined in each technical chapter of the EES. The study area can vary depending on the environmental discipline (e.g. soils and contaminated land in Chapter 18: *Soils and contaminated land*) has a study area consisting of land within and up to 150m from the project area, whilst landscape and visual (Chapter 11: *Landscape and visual effects*) has a study area of up to 1km from the project area.

Importantly, consultation was undertaken during development of the project design and throughout preparation of the EES. Ongoing engagement with Councils and relevant government agencies and statutory bodies represented on the TRG has allowed key stakeholder issues to be incorporated into the EES. The results of consultation have guided the development of the project and the assessments for the EES. Chapter 7: *Consultation and stakeholder engagement* discusses the approach taken to community and stakeholder consultation for the project.

Figure 4.2 EES assessment approach

4.2.1 Existing conditions

Specialists assessed the existing conditions (or current state) of their respective study areas for the project through a combination of desk-based and field investigations. The existing conditions formed a baseline detailing the existing environmental quality for each discipline, against which potential impacts of the project could be benchmarked. The scope of the baseline studies was informed by the scoping requirements as well as the requirements of relevant legislation and guidelines.

Existing conditions are provided for each technical discipline in Section 6 of each EES technical chapter (Section 7 for Chapter 14). Technical disciplines obtained current information through field surveys on site, such as ecology and viewpoint photography, monitoring of existing conditions (e.g. noise), and in some instances through obtaining information from third parties or publicly accessible data records (e.g. air quality monitoring data and species survey records). The source, age and accuracy or reliance of information is discussed in the technical chapters.

Where possible desk-based records or third-party data was verified in the field through surveys, monitoring or observations to confirm they were still accurate. Where any limitations were encountered for a discipline in obtaining existing information, this is noted in the technical chapter alongside the methodology.

4.2.2 Standard controls

Once the existing conditions were established, the standard controls were identified to inform the initial risk assessment. Standard controls include legislative requirements and the more specific requirements contained within the relevant standards, guidelines and policy documents relevant to each technical discipline. These do not include any project-specific controls or monitoring requirements. The initial risk assessment assumes the inclusion of standard controls on the project as a minimum.

STANDARD CONTROLS

Standard controls refer to those mitigation measures which are assumed to be inherent in the design as a requirement common to all projects and as a minimum for all contractors to adhere with. This would include adherence to legislative requirements and application of control measures to meet industry best practice standards.

4.2.3 Environmental risk assessment (ERA)

As required by the EES Scoping Requirements, a risk-based approach was adopted during the EES studies, and an integrated risk and impact assessment process underpinned each specialist study. The ERA process covered risks associated with all project phases, including: initial design phase (D); construction phase (C); and operations/maintenance (O) phase of the project (referred to as D, C and O within risk tables presented in this EES).

The purpose of the ERA was to provide a systematic approach to identifying and assessing all environmental risks as a result of the project, including cultural heritage, social, health and economic aspects. Through the ERA process, risks were identified, analysed and evaluated. Where appropriate, project-specific management and mitigation measures were developed to minimise the level of risk to meet project objectives (refer to Figure 4.3).

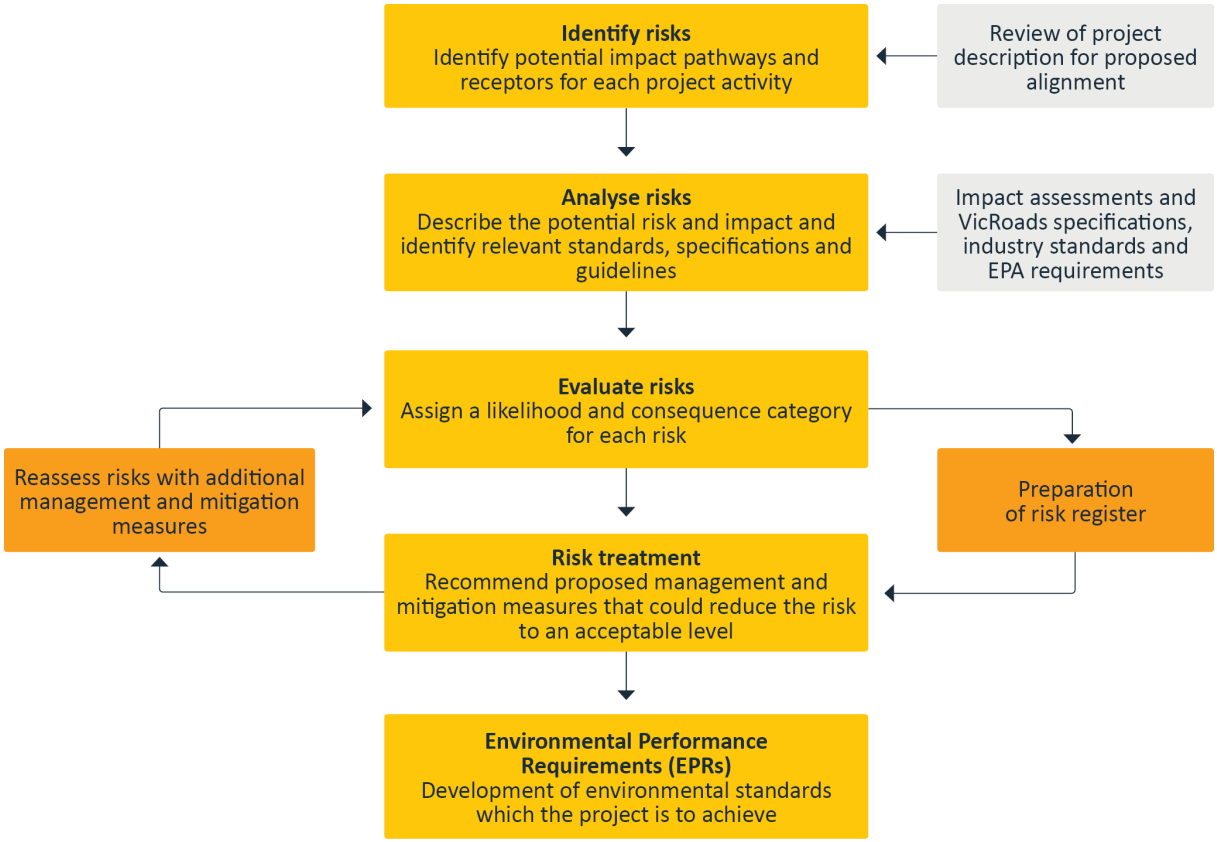

Figure 4.3 ERA process

The ERA takes into account concept designs, draft construction methodology, existing condition reports, and draft environmental impact assessment reports. The ERA process identified primary environmental impacts and associated risks which are directly attributable to project activities, such as land clearing. An initial risk rating was assigned for the primary environmental impacts. This initial rating was assigned by identifying the appropriate consequence and likelihood criteria for that primary environmental impact.

The assessment of primary environmental impacts assumes that all standard mitigation measures are in place and working effectively (e.g. EPA guidelines and SEPPs). Where the initial risk rating was categorised as medium or higher, additional controls were identified and a residual risk rating assigned. This process prioritised activities and events with medium to extreme levels of risk above those with a negligible to low level of risk, the latter of which could be readily managed through standard controls. Those with a higher risk, requiring additional controls, were the subject of a detailed impact assessment.

ADDITIONAL CONTROLS (MITIGATION)

Additional controls or mitigation measures refer to identified measures to avoid or mitigate the main potential adverse environmental effects (primary environmental impact) or related risk. They are measures that go beyond the standard controls and typically include site or project-specific measures designed to avoid or mitigate identified potential effects or initial risks. These are referred to as 'additional controls' in the risk assessment, as included in the risk assessment tables in each technical chapter and EES Attachment I: Environmental risk assessment report, whilst they are also referred to as mitigation measures in the impact assessment sections of the EES.

With the application of mitigation measures, a residual effect and risk can be determined for the project. The additional controls/mitigation measures included in the EES relate to corresponding EPRs, which will form part of the environmental management framework (EMF) for the project delivery.

In scoring the likelihood of risks eventuating, the technical specialists considered known historical occurrences of similar events (e.g. has the impact occurred on similar projects), the frequency of exposure to the risk and site-specific project knowledge. In addition to looking at historical occurrence, technical specialists were asked to take a conservative approach where uncertainty was high.

Consequence criteria were developed for the project in consultation with technical specialists. As a result, a discipline and aspect-specific set of consequence descriptors were used to define what would be considered an insignificant, minor, moderate, major and catastrophic consequence associated with a risk eventuating and the environmental value/asset being affected. The consequence criteria are presented in each discipline-specific impact assessments in the appendices and Attachment I: *Environmental risk assessment report*. These criteria were developed based on the credible, worst case scenarios. Table 4.1 shows the analysis matrix used for assessing risk. Table 4.2 shows the likelihood categories used in the risk assessment.

Table 4.1 Risk analysis matrix

			Likelihood				
Consequence	Risk categories		Rare	Unlikely	Possible	Likely	Almost certain
			A	B	C	D	E
	Catastrophic	5	Medium	High	High	Extreme	Extreme
	Major	4	Medium	Medium	High	High	Extreme
	Moderate	3	Low	Medium	Medium	High	High
	Minor	2	Negligible	Low	Low	Medium	Medium
	Insignificant	1	Negligible	Negligible	Negligible	Low	Low

Table 4.2 Risk assessment likelihood categories

Likelihood				
Rare (A)	**Unlikely (B)**	**Possible (C)**	**Likely (D)**	**Almost certain (E)**
Less than once in 12 months OR 5% chance of occurrence during course of the project	Once to twice in 12 months OR 5-10% chance of occurrence during course of the project	3 to 4 times in 12 months OR 30% chance of occurrence during course of the project	5 to 6 times in 12 months OR 50% chance of occurrence during course of the project	More than 6 times in 12 months OR 100% chance of occurrence during course of the project
The event may occur only in exceptional circumstances	The event could occur but is not expected	The event could occur	The event will probably occur in most circumstances	The event is expected to occur in most circumstances
It has not happened in Victoria but has occurred on other road projects in Australia	It has not happened in metropolitan Melbourne but has occurred on other road projects in Victoria	It has happened in metropolitan Melbourne	It has happened on a road project in metropolitan Melbourne in the last 5 years	It has happened on a road project of similar size and nature in metropolitan Melbourne within the last 2 years. OR It has happened multiple times on a road project in the region within the last 5 years.

VicRoads, MRPA, the TRG and technical specialists were involved in the development of the likelihood definitions and the consequences criteria which forms the basis of the ERA methodology described in full in EES Attachment I: *Environmental risk assessment report*.

This assessment also underpinned the establishment of the EPRs, which set out the environmental outcomes for the project (see Section 4.2.7 of this chapter).

4.2.4 Impact assessment and mitigation

Impacts initially risk rated as 'medium' or above were categorised as 'key risks' and assessed by the specialist studies. The impact assessment also identified potential positive impacts.

The approach to assessment was tailored for each specialist study. Specialists applied methods defined by relevant legislation, policies, standards and guidelines, combined with their professional judgement and experience to assess potential project impacts.

The specialist studies examined the scale, duration and magnitude of the key impacts, taking into consideration standard controls where appropriate. For several technical chapters, the potential impacts were determined quantitatively using modelling or calculations to assess how the existing conditions or baseline was altered with the project in construction and operation phases. The predicted impacts 'with project' were compared against existing conditions (i.e. 'without project'), legislative, industry best practice and project-specific objectives to determine the level of impact from the project. Technical chapters provide details of specific criteria used for assessment of impacts (e.g. for noise, vibration, contaminated soils and air quality).

Where key impacts were determined to be potentially significant (i.e. medium risk or above), the specialists identified project-specific management and mitigation measures (additional controls) that could be adopted to reduce risks and impacts to acceptable levels.

During the impact assessment early findings were discussed with the design team to allow mitigation measures to be embedded in the design where possible. The specialists also completed an assessment of the project impacts against the evaluation objectives, which are also reported within the technical chapters.

The impact assessment and risk assessment processes were integrated throughout the development of this EES. The risk assessment enabled the team to identify all potential risks, refine the assessment process and target impact assessments accordingly. This process of continual refinement not only ensured that the potential risks and mitigation measures for the project were identified, but also provided a robust understanding of the project's environmental effects.

The main findings of the specialist studies are summarised in discipline-specific chapters (8 to 20) of this EES, whilst full details are found in the technical appendices (A to O).

4.2.5 Cumulative impact assessment and mitigation

MRPA recognised that other major infrastructure projects occurring within the same geographical area (both under construction or proposed projects) could compound the potential impacts of the project, potentially creating 'cumulative impacts'. These potential impacts were addressed through the environmental risk and impact assessment process undertaken for each environmental discipline, where relevant, and included in the specialist studies.

CUMULATIVE IMPACTS

According to the Ministerial Guidelines (2006), cumulative impacts occur where a project, in combination with one or more other proposed projects, or existing activities in an area, may have an overall significant effect on the same environmental asset.

The scope of projects considered as part of the cumulative impact assessment was tailored by each discipline; however, the Edithvale and Bonbeach Level Crossing Removal project and Hawthorn Football Club future development were considered by all disciplines as a minimum due to their proximity and potential interaction with the project.

Identified cumulative impacts are included in the final risk assessment register, which forms part of EES Attachment I: *Environmental risk assessment report*. The results of the cumulative impact assessment are described further in Chapter 21: *Cumulative impacts*.

4.2.6 Matters of National Environmental Significance (MNES)

Three types of MNES are relevant to the project. These are:

- the Edithvale-Seaford Ramsar Wetland,
- listed threatened species and communities, and
- migratory species.

Figure 4.4 shows examples of the bird life found within and nearby the project area.

Figure 4.4 Migratory birds found in the project area; Curlew Sandpipers (two in foreground), Sharp-tailed Sandpipers and Grey Teals (four in background)

The potential impact on MNES from all phases of the project has been assessed for this EES. Species assessed include migratory birds, particularly Latham's Snipe and Sharp-tailed Sandpiper, three threatened bird species (Australasian Bittern, Curlew Sandpiper and Australian Painted Snipe), Grey-headed Flying Fox and two threatened flora species (Swamp Everlasting and Matted Flax-lily). Two critically endangered EPBC Act communities will also be impacted and have been assessed.

The findings of the MNES assessment are summarised in Chapter 22: *Matters of National Environmental Significance* and should be read in conjunction with Chapter 10: *Biodiversity*, Chapter 16: *Surface water and hydrology* and Chapter 17: *Groundwater*.

4.2.7 Environmental performance requirements (EPRs)

The project has adopted a performance based approach to environmental management. They have been developed through the EES to address identified risks and impacts and to achieve delivery of acceptable project wide environmental outcomes.

It is important to note that the EPRs do not always define management or mitigation measures; in many cases they establish a performance requirement. This performance based approach allows for some innovation and flexibility in how compliance can be achieved during delivery of the project for certain aspects.

EPR

EPRs define project wide environmental outcomes and standards that must be achieved during the detailed design, construction and operational phases of the project.

EPRs were developed by technical specialists as part of the impact assessment process. The EPRs are based on the standard controls and the additional project-specific management and mitigation measures identified to reduce the risk to an acceptable level. The EPRs set performance outcomes for the project to meet during detailed design, construction and operation. By achieving the EPRs, the project will ensure all environmental risks and impacts are managed to an acceptable level. Certain EPRs are linked to a specific management plan or content to be contained within the construction environmental management plan (CEMP). It is important to note that EPRs are not mitigation measures themselves, but mitigation measures are implemented to achieve the EPRs.

The EES assessment framework adopted a hierarchical approach to impact management of Avoid – Minimise – Manage to inform the EPRs for the project (Figure 4.5).

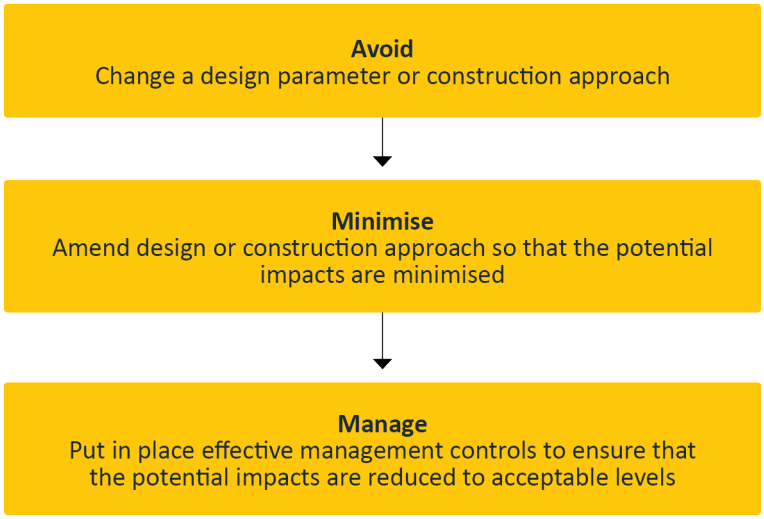

Figure 4.5 Hierarchical approach to impact management

The complete list of recommended EPRs is outlined Chapter 23: *Environmental management framework*.