Edithvale and Bonbeach Level Crossing Removal Projects

ASSESSMENT

under

ENVIRONMENT EFFECTS ACT 1978

Minister for Planning

August 2018

GLOSSARY

ASS	Acid sulphate soils
CEMP	Construction environment management plan
DELWP	Department of Environment, Land, Water and Planning
EES	Environment effects statement
EMF	Environmental management framework
EPA	Environment Protection Authority
EPBC	Environmental protection and biodiversity conservation
EPR	Environmental performance requirement
EVC	Ecological vegetation class
IAC	Inquiry and advisory committee
LXRA	Level Crossing Removal Authority
MNES	Matters of national environmental significance
OEMP	Operational environment management plan
PASS	Potential acid sulphate soils
SEPP	State environment protection policy
TDS	Total dissolved solids

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EXECUTIVE SUMMARY

On 9 March 2017, the Level Crossing Removal Authority (LXRA) referred the Edithvale and Bonbeach Level Crossing Removal Projects to me for a decision on the need for an environmental effects statement (EES) for the project. On 5 April 2017, I decided that an EES was required.

LXRA prepared an EES which I endorsed for public exhibition from 19 March to 2 May 2018.

On 8 May 2018, I appointed an inquiry and advisory committee (IAC) to consider the EES and draft planning scheme amendments. Planning Panels Victoria received 249 submissions on the exhibited EES and the IAC held a public hearing over eight days from 4 June to 15 June 2018. The IAC provided its report to me on 30 July 2018. The report, along with the EES, its supporting technical reports and public submissions have informed my assessment of the environmental effects of the project under the *Environment Effects Act 1978*.

My assessment is that the projects can be built and operated with acceptable environmental effects, subject to my approval of an amended Environmental Management Framework.

My assessment will be provided to statutory decision-makers under Victorian law. Decision-makers must then consider this assessment before deciding whether and how the projects should proceed.

1 INTRODUCTION

On 9 March 2017, I received a referral, under the *Environment Effects Act 1978*, from the Level Crossing Removal Authority (LXRA) for the Edithvale Bonbeach Level Crossing Removal Projects (the projects). I decided on 5 April 2017 that an environment effects statement (EES) was required. My decision to require an EES included the procedures and requirements set out in my reasons for decision, in accordance with section 8B(5) of the Act, *viz*.:

- the regional groundwater regime resulting in potential changes to hydrological conditions at the Ramsar listed Edithvale-Seaford Wetlands;
- the ecological character and habitat values of the Edithvale-Seaford Wetlands, and the dependent flora and fauna, in particular the critical components of habitat for listed waterbirds, due to alterations in the groundwater regime; and
- the protected beneficial uses of groundwater, due to alterations in the groundwater regime, along with risks to human health, recreation and ecosystems due to changes in water quality from activation and excavation of potentially acid sulphate soils and from interception/movement of existing contaminated soil and groundwater.

Other potential effects on the social or environmental setting are unlikely to be significant and should be readily addressed and mitigated through existing statutory processes and requirements under the *Aboriginal Heritage Act 2006*, *Environment Protection Act 1970*, *Planning and Environment Act 1987*, including construction noise, traffic and transport impacts, as well as visual impacts.

1.1 Purpose of this document

This report documents my assessment of the environmental effects of the projects. My assessment is the final step in the EES process under the Environment Effects Act and is for the consideration of the Minister for Public Transport and to otherwise inform decisions required under Victorian law in order for the project to proceed. Section 6(2) of the Environment Effects Act provides that works on the projects may not commence until this assessment is completed and considered by statutory decision-makers.

1.2 Project description

The EES identified the projects as the removal of the level crossings located at Edithvale Road, Edithvale and Station Street/Bondi Road, Bonbeach. The Edithvale and Bonbeach level crossings form part of the Frankston rail corridor providing passenger connectivity between the suburb of Frankston and Melbourne city. Rail trenches excavated under the roads will grade separate the crossings of both projects. The area directly affected by the projects comprises land currently used for rail and rail infrastructure. The projects are described in more detail in Chapter 2 of the EES.

2 STATUTORY PROCESSES

2.1 Environment Effects Act

The EES decision required LXRA to investigate the potential extent, significance and related uncertainties of the projects on the regional groundwater regime, the Ramsar listed Edithvale-Seaford Wetlands and protected beneficial uses of groundwater.

Draft Scoping Requirements were exhibited for public comment from 14 August 2017 to 4 September 2017. I issued the final Scoping Requirements in September 2017. The Scoping Requirements specified the range of matters to be addressed in the EES. A technical reference group[1] was convened by the Department of Environment, Land, Water and Planning (DELWP) in accordance with normal EES practice to provide advice to the proponent and DELWP on the preparation of the EES.

The EES, prepared by LXRA was placed on public exhibition from 19 March to 2 May 2018. Draft planning scheme amendments (C155 Edithvale and C156 Bonbeach) to the Kingston Planning Scheme were also exhibited with the EES. Planning Panels Victoria received 249 submissions; there was one submission on the planning scheme amendment and two submissions from state and local government bodies.

On 8 May 2018, I appointed an inquiry under the Section 9(1) of the Environment Effects Act. The Inquiry members were also appointed as an advisory committee under sections 151 of the *Planning and Environment Act 1989* to consider the draft amendment. On 28 March 2018, I published terms of reference for the combined inquiry and advisory committee (IAC) review submissions and inquire into the environmental effects of the proposal and to consider the draft planning scheme amendment and related matters raised in submissions.

Th IAC held a directions' hearing on 9 May 2018*,* followed by public hearings over eight days from 4 June to 15 June 2018. The IAC provided its report to me on 30 July 2018. The report, evidence tabled at the IAC, public submissions and the EES have informed the preparation of this assessment of the environmental effects of the projects under the Environment Effects Act.

2.2 Victorian statutory approvals

The projects require a number of Victorian statutory approvals, including:

- an amendment to the Kingston Planning Scheme under the Planning and Environment Act for each project; and
- a cultural heritage management plan under the Aboriginal Heritage Act.

Other approvals that might be required for the projects under Victorian legislation include:

- a permit to take protected flora under the *Flora and Fauna Guarantee Act 1995*;
- a consent for works within a road reserve under the *Road Management Act 2004*;
- a licence to use groundwater and/or a permit for works on waterways under the *Water Act 1989*;
- a management authorisation to remove any wildlife under the *Wildlife Act 1975*; and
- consent under the *Coastal Management Act 1995*.

2.3 Commonwealth approval

In March 2018, LXRA referred the projects to the Commonwealth Government (Referral EPBC 2017/7906) for a determination on whether the project was a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

[1] The technical reference group comprised representatives of departments and authorities with statutory interests or specialised expertise relevant to the project: DELWP (Planning and Environment portfolios), Melbourne Water, Environment Protection Authority, Heritage Victoria and City of Kingston. The proponent and relevant members of its consultant team also attended meetings.

On 8 May 2017 the projects were determined to be a controlled action requiring assessment and approval under the EPBC Act due to potential impacts on matters of national environmental significance (MNES):

- Ramsar wetlands (Sections 16 and 17B);
- listed threatened species and communities (Sections 18 and 18A); and
- listed migratory species (Sections 20 and 20A).

The Commonwealth determined that the project's impacts on MNES were to be assessed under the bilateral agreement with the Victorian Government made under Section 45 of the EPBC Act.

3 MANAGEMENT OF ENVIRONMENTAL EFFECTS

I acknowledge that the projects will generate both positive and negative environmental effects. A sound regulatory framework and environmental control regime is needed to ensure that adverse effects of the projects are effectively mitigated and managed. To that end, and to provide an integrated structure for this assessment, key aspects of legislation and statutory policy relevant to the potential effects of the projects were synthesised into a set of evaluation objectives in the scoping requirements for the EES. The objectives were used by the proponent in its assessment of alternatives and effects within the EES and by the IAC in their assessment. The evaluation objectives are listed in full in Table 1. The first column of Table 1 refers to the assessment section where each of the evaluation objectives is addressed.

Table 1. Assessment evaluation objectives.

Section	Evaluation objective
4.1	**Groundwater:** *To minimise effects on the regional groundwater regime and quality particularly as they might impact on the hydrology of the Edithvale-Seaford Wetlands and elsewhere on other beneficial uses.*
4.2	**Acid sulphate soils and contamination:** *To prevent adverse environmental or health effects from disturbing, storing or influencing the transport/movement of contaminated or acid-forming material.*
4.3	**Biodiversity:** *To avoid, minimise and/or offset adverse effects on native vegetation, listed threatened species and ecological communities, listed migratory species, the Ramsar listed Edithvale-Seaford Wetlands, other protected flora and fauna and groundwater dependent ecosystems.*

The primary tools in the proposed regulatory framework and environmental control regime consist of a set of planning controls, an environmental management framework and environmental performance requirements, and an approved cultural heritage management plan. This section details and addresses the adequacy of the proposed planning controls and environmental management framework.

3.1 Planning controls

The Planning and Environment Act sets out processes for the amendment of Victorian planning schemes. Draft Kingston Planning Scheme Amendment C155 (Edithvale) and draft Kingston Planning Scheme Amendment C156 (Bonbeach) were developed by the proponent and exhibited with the EES. Amendments to the Kingston Planning Scheme are required to provide comprehensive statutory planning controls for the projects.

The intent of the incorporated documents is to exempt the projects from all other provisions of the planning scheme, subject to conditions within the documents. Kingston City Council will be the responsible authority for administrating and enforcing the projects in the Kingston Planning Scheme. The incorporated documents require approval by me as planning authority in my capacity as the Minister for Planning under the Planning and Environment Act.

Draft Amendment C155 proposes to insert incorporated document *Edithvale Road, Edithvale Level Crossing Removal Project Incorporated Document, January 2018* into the schedules to Clause 52.03 and Clause 81.01 of the Kingston Planning Scheme. The purpose of draft Amendment C155 is to facilitate the Edithvale Level Crossing Removal Project (Edithvale project) by allowing the use and development of land for the project in accordance with the control in the incorporated document.

Draft Amendment C156 proposes to insert incorporated document *Station Street/Bondi Road, Bonbeach Level Crossing Removal Project Incorporated Document, January 2018* into the schedules to Clause 52.03 and Clause 81.01 of the Kingston Planning Scheme. The

purpose of draft Amendment C156 is to facilitate the Bonbeach Level Crossing Removal Project (Bonbeach project) by allowing the use and development of land for the project in accordance with the control in the incorporated document.

The draft incorporated documents propose an Environmental Management Framework (EMF) as a secondary consent that must be approved before main construction works commence. The EMF must include environmental performance requirements (EPRs) applicable to the design, development and operation of the projects. The draft incorporated documents define preparatory and other works that may be undertaken before the EMF has been approved.

One submission was received requesting changes to the draft incorporated documents, including extending the expiry date to align with the proposed monitoring program and revising conditions around drainage. The proponent tabled draft versions of the incorporated documents in response (documents 4 and 5, dated 4 June 2018). The IAC considered the revisions provided by LXRA as appropriate and recommended an expiry date of 1 December 2030.

3.2 Environmental management framework

An EMF was exhibited as part of the EES. The broad structure of the EMF was endorsed by most submitters and the IAC. An essential part of the proposed EMF is the EPRs, which are proposed to set detailed environmental standards under which the LXRA and its contractors must mitigate or manage the environmental effects of the projects (see Appendix A). The draft EPRs were the subject of discussion during the hearings and through submissions, with the IAC concentrating its assessment and recommendations on the content of the EPRs. The IAC found that the projects will deliver *an appropriate balance of environmental, economic and social outcomes subject to the Environmental Management Framework being implemented, including the monitoring and mitigation plans as set out in the EPRs.*

The last version of the EPRs provided to the IAC by LXRA was Version 3, 15 June 2018. The IAC used that version as the basis for its assessment. The IAC examined the form and content of the EPRs to ensure that they created an appropriate framework for mitigating and managing the environmental effects of the projects. In making its recommendations, the IAC produced a table in its report to set out its recommended changes to the Version 3 EPRs (see Appendix A). My recommendations for EPRs (see Appendix A) aim to clarify timing, constraints and synergies while integrating the EPRs into a cohesive articulation of the project's environmental performance.

The EMF sets out the accountabilities and monitoring requirements associated with the EPRs in order to ensure that the environmental impacts and risks of the projects are managed appropriately. LXRA is responsible for overseeing and engaging contractors and consultants for all aspects of the projects. This includes site investigations, stakeholder engagement, obtaining key planning approvals and procurement, through to construction delivery and project commissioning.

Fulfilling the responsibilities and accountabilities across all elements of the EMF involves LXRA, an alliance contractor and regulators. The contractor's responsibilities would be included as contractual requirements in the project alliance agreement. At the completion of construction and project commissioning, the rail infrastructure manager would become responsible for the ongoing operation and maintenance of the infrastructure delivered through the projects.

Some of the EPRs require the preparation of plans that specify required environmental outcomes, whilst providing for flexibility and innovation by the selected contractor. Plans are presented in Table 2 as a hierarchy of overarching, subordinating and monitoring/mitigation. The IAC considered the approach to overarching and subordinate plans consistent with standard construction industry practice. However, the content of the monitoring or mitigation plans proposed in the exhibited EES was the subject of submissions and expert evidence

during the hearings. The IAC recommended detailed changes to the EPRs responsible for each of the plans (see Appendix A).

Table 2: Environmental management plans required by the EMF.

Hierarchy	Proposed plan	EPR
Overarching	Construction Environmental Management Plan	EMF2
	Community and Stakeholder Engagement Management Plan	SC1
	Construction Noise and Vibration Management Plan	NV2
	Cultural Heritage Management Plan	AH1
Subordinate	Acid Sulfate Soil Management Plan	CL2
	Spoil Management Plan	B2
	Transport Management Plan	T1
	Public Transport Disruption Management Plan	T2
	Business Disruption Plan	B1
Monitoring/ Mitigation	Groundwater Management and Monitoring Plan	GW3
	Foreshore Native Vegetation Monitoring Plan	FF7
	Edithvale and Wannarkladdin Wetland Monitoring and Mitigation Plan	FF8
	Groundwater Quality Mitigation Plan	CL5

Whether an EPR calls for a plan, or not, there is a question as to what level of prescription in the planning framework is necessary to drive an appropriate level of mitigation and management of the environmental effects of the projects. I have come to the conclusion that the EPRs should remain for the most part focussed on outcomes – rather than descending into a detailed prescription of how each outcome should be achieved. I agree that in some instances a greater level of detail will be appropriate. Striking the balance between detail and outcome-orientated performance is, I think, the best way to ensure that the projects will be capable of responding to the environmental issues which arise.

I consider that the broad architecture for governance of environmental management is appropriate. My support for this framework is based on my power under the incorporated document to give effect to this assessment and require the proponent to submit an environmental management strategy including the EPRs for my approval. I have made a number of recommendations on the EPRs in Section 4 and Appendix A. The final EPRs must be updated by the proponent in consultation with DELWP prior to the proponent submitting them for my approval.

4 ASSESSMENT OF ENVIRONMENTAL EFFECTS

The EES and technical reports provide a comprehensive risk-based analysis and response to the projects and their potential environmental effects. On careful consideration of the applicable legislation, state policy, submissions, tabled evidence on best practice, I agree with the IAC that the projects are feasible and their environmental effects manageable subject to the EMF's implementation.

Central to the ongoing management of environmental effects is the implementation of groundwater management through constructed mitigation measures at Edithvale and application of the EPRs. The IAC noted that all groundwater experts heard offered opinions that the proposed passive drain for Edithvale was a plausible mitigation solution for potential groundwater impacts there (see Section 4.1). However, none could offer an example of where the proposed solution had been successfully deployed elsewhere. That said, it gives me comfort that prior to construction the proposed design at Edithvale must be independently peer reviewed to confirm that the proposed design is capable of achieving the groundwater performance outcomes.

The reliance on ongoing mitigation of the projects' effects underscores the importance of continuous monitoring and intervention if project-induced changes in groundwater give rise to environmental effects in the future. The need for monitoring and management of groundwater will undoubtedly outlast the construction phase of the project and likely outlast LXRA. To ensure that mitigation measures built into the projects continue to perform as designed, into the future, I recommend a new EPR, EMF4. The EPR calls for an articulation of the ongoing ownership and responsibility for legacy monitoring equipment. The strategy must detail asset handover from LXRA to the acquiring authority and nominate responsibility for rectification works that may be required from time-to-time.

Noting that the Ramsar listed Edithvale-Seaford Wetlands are hydrologically separated by the Patterson River, I accede that the projects cannot impact the Seaford Wetland and are unlikely to have unacceptable impacts on the Edithvale Wetland. Even so, I further endorse the careful and continued monitoring of groundwater and ecological response to the projects proposed in the EPRs. Monitoring will ensure that no unforeseen future effects unduly impact this precious environmental asset. The projects do not threaten flora and fauna species nor migratory birds via changes in the ecological character of Edithvale-Seaford Wetlands.

Having regard to the evaluation objectives in the EES scoping requirements, public submissions and the lAC's conclusions on the significant effects of the project, I am satisfied that the localised issues of acid sulphate soil activation and other short-lived construction impacts can be managed through the implementation of the EMF. The EPRs set out measures to prevent, mitigate or compensate for significant adverse effects of the projects' construction and strike a balance of environmental, economic and social outcomes.

The IAC made a number of findings and recommendations in respect of the projects. My response to the IAC's key findings and recommendations, along with my assessment of the main environment effects of the projects, are detailed in Sections 4.1 to 4.3 below.

4.1 Groundwater

Groundwater impacts are addressed in Technical Report A, Section 3 and Section 5 of the EES and in Sections 6 and 8 of the IAC report. I am generally satisfied that the potential impacts of the projects on groundwater are accurately described in the EES. The five groundwater EPRs proposed by LXRA have all been subject to recommendations by the IAC.

Evaluation objective

To minimise effects on the regional groundwater regime and quality particularly as they might impact on the hydrology of the Edithvale-Seaford Wetlands and elsewhere on other beneficial uses.

Context
With their trench design, the projects will interact with local and regional groundwater. However, the pile walls of the trenches will be constructed prior to excavation, so the potential for groundwater drawdown near the construction works will be negligible. Unmitigated, long-term changes in groundwater during operation would likely be mounding of groundwater (raising the water table) on the upstream (landward) side of the rail alignment and drawdown (lowering the water table) on the downstream (bay) side.

As summarised by the IAC, groundwater mounding might result in:

- changed hydrological regime of nearby wetlands;
- waterlogging;
- increased exposure area and duration where existing sub-surface foundations experience groundwater levels at or near the ground surface; and
- contaminant mobilisation and migration.

And groundwater drawdown might result in:

- reduced water availability for groundwater users;
- saltwater intrusion, with impacts on beneficial uses of groundwater;
- subsidence of unconsolidated sub-surface sediments, leading to adverse impacts on structures and buildings;
- loss of native foreshore vegetation; and
- activation of potential acid sulphate soils and/or mobilisation of existing acidity and groundwater acidification.

Discussion
Construction and ongoing operation of the projects has the potential to alter groundwater levels. Interaction with the local groundwater flow regime will likely differ between the projects. At Bonbeach, groundwater flows south (towards the Patterson River) and almost parallel to the proposed trench. Conversely, at Edithvale, groundwater flow is perpendicular to the trench alignment. At Bonbeach, the trench will be excavated almost on the groundwater divide (where groundwater flows away from the coastal dune), while at Edithvale, the trench will be located to the west of the divide.

Potential effects
The IAC accepted the EES' findings that analyses of potential groundwater impacts indicated that further mitigation, beyond the project's design and EPRs, was not warranted for the works at Bonbeach. However, groundwater management is required to mitigate the long-term effects of the project at Edithvale.

The groundwater modelling, undertaken during the EES, indicated that project-induced mounding of the water table has the potential for subtle changes to the groundwater component of the Edithvale Wetland water balance. In general, minor changes were shown between existing water levels and those predicted with the project. In the wettest model year, even without mitigation, the 0.1m mounding contour is some 500m from the wetland. The model depicted no discernible changes to the wetted extent of the wetlands with the project.

The low-lying nature of the Edithvale project area with its naturally shallow groundwater levels gives rise to periodic waterlogging at the ground surface. Without mitigation, the proposed pile walls will likely increase the frequency of waterlogging and result in long-term impact to hundreds of residential properties across an area of approximately 25ha east of the Edithvale trench. Even if not coincident with the ground's surface a raised water table could detrimentally impact foundations within the project area, by increasing the contact time of shallow foundations with the water table.

Depending on the amount of groundwater mounding and diversion, existing contaminant plumes may migrate into previously non-impacted areas. Migration of contaminant plumes could result in adverse changes to groundwater chemistry (contamination) precluding some or all the beneficial uses of groundwater.

Groundwater drawdown on the bay side of the Edithvale trench during operation would lower the water table and potentially affect groundwater users. LXRA's analyses showed that all licensed groundwater extraction bores are situated beyond the predicted area of influence of the projects. However, without mitigation, there are three registered stock and domestic bores within the predicted drawdown area of the Edithvale project. Each are at, or beyond, their operational life and only one would see a reduction in water level that might reduce its utility. In addition, there are likely to be unregistered bores that may be affected but these were not included in the analyses.

Drawdown of the water table on the bay side of the proposed trench at Edithvale may influence the position of the salt/fresh groundwater interface. However, this transition will occur slowly —slower than predicted sea level change— with water table salinity responding dynamically to seasonal variations in recharge and evaporation. Without mitigation, the predicted change in salinity caused by the movement of the salt/fresh groundwater interface is around 500mg/L TDS in the water table aquifer, over a period of 100 years.

The risk of subsidence caused by the projects is directly related to the magnitude and extent of drawdown, combined with compressible soils. Without mitigation, there will be drawdown due to the projects and a thin layer of compressible soil is known to occur in the vicinity of the projects. However, LXRA argue in their EES that project induced settlement in the order of 10mm due to groundwater drawdown would be unlikely to cause impact in itself, unless buildings or other infrastructure are highly sensitive to movement.

Lowering the water table could lead to activation of potential acid sulphate soils through their exposure to air. Groundwater drawdown could also result in the loss of vegetation from the Aspendale to Carrum Foreshore Reserve through a lowering of the water table beyond the reach of plant roots. These issues are discussed in more detail in Sections 4.2 and 4.3, respectively.

Mitigation
The EES proposed that a passive sub-surface horizontal drain would mitigate the impacts of the rail trench on groundwater for the Edithvale project. The drain would consist of an underground pipe installed around the outside of, and adjacent to, the pile walls. The pipe would be permanently below the naturally variable water table and perforated to allow groundwater inflow and outflow to provide a permeable connection across the rail trench. Conceivably, that connection would remove the potential for difference in groundwater levels on either side of the trench.

The IAC requested LXRA to provide examples of where similar approaches had been successfully used elsewhere. None of the three expert witnesses called by LXRA were able to provide an example. However, all three, as well as the expert witness called by Kingston City Council, provided assurances to the IAC that it was technically feasible to provide an engineering solution that would satisfactorily mitigate the potential impacts of the project on groundwater mounding and drawdown at Edithvale.

The IAC was satisfied that there are feasible engineering measures to mitigate the impacts of the project on groundwater at Edithvale. However, the IAC concluded that the necessary works will likely be more complex than a simple horizontal drain (perhaps multiple drains and pumps, for example). Regardless of approach, the IAC observed that key issues needed to be addressed at the design phase:

- risk of clogging due to physical, chemical and biological processes;
- inspection, maintenance and monitoring during operation;
- consideration for repair or replacement; and
- continency measures and redundancy.

The mitigation performance criteria have been consolidated within EPRs (see Appendix A) that will be set out in the EMF. Any proposed mitigation (either the engineering solution proposed by the EES, or alternative) must perform to meet those criteria set out in GW2;

mitigation design will be subject to independent peer review (GW4). A Groundwater Monitoring and Management Plan (GW3) must also be developed to ensure timely warning if groundwater cannot be maintained as per the proposed criteria. And finally, to effect remedial works, the Edithvale project must be built to enable inspection and maintenance to ensure the continued performance of the groundwater management system (GW5).

Assessment
It is my assessment that the potential groundwater level and quality impacts should be manageable and within acceptable thresholds through the proposed engineering controls and EPRs. However, mitigation of groundwater effects is particularly reliant on the successful deployment of engineering solutions to maintain 'natural' groundwater levels on either side of the Edithvale trench.

The ongoing monitoring and maintenance of the mitigation solution will be critical to the continuous performance of the structure and its ongoing compliance with the EPRs. While I note the IACs recommendations for particular aspects of monitoring design, my preference is that the monitoring is designed by experts in the field with input from the management authorities. The EPRs should specify the performance requirement of the monitoring rather than the number or location of transects to be monitored. I agree with the IAC that the EPRs should require LXRA to document handover and future ownership of the monitoring network, along with accountability for compliance reporting and remedial works if required.

4.2 Acid sulphate soils and contamination

Acid sulphate soils and contamination impacts are addressed in Technical Report C, Section 3 and Section 7 of the EES and in Sections 7 and 8 of the IAC report. I am generally satisfied that the potential impacts of the project's disturbance of contaminated/acid sulphate soils are accurately described in the EES. Five EPRs (CL1-5) were proposed by LXRA to deal with spoil and waste management, acid sulphate soils and contaminated groundwater management. All were accepted by the IAC.

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

Context
Acid sulphate soils (ASS) contain iron sulphides, predominantly pyrite. Where the water table is lowered —through natural fluctuations or human-induced drawdown— to expose ASS to the air, the soil oxidises to produce sulphuric acid. Groundwater can then entrain the acid and move it through the environment. Acidic groundwater poses a risk to ecology, human health and in-ground structures and has the potential to release associated contaminants such as metals and nutrients. ASS is a collective term than encompasses both actual acid sulphate soils already oxidised (where soil pH is ≤ 4.0) and potential acid sulphate soils (PASS) not yet exposed. The EES refers to the ASS known to occur in the project sites as coastal acid sulphate soils.

LXRA's investigations for their EES indicates that ASS, contaminated soil and the potential for contaminated groundwater will require active management during excavation and construction of the projects.

Discussion
The EES found that there is a high potential of intercepting PASS or ASS during the rail trench excavation at Edithvale. While the potential is less at Bonbeach, excavation in the deeper parts of the trench is likely to encounter PASS. Of the total estimated spoil from the projects (358,000m3 ex-situ), only around 15% is predicted as ASS. The EES asserts that the majority of the spoil (over 70%) will be clean fill material. While these numbers are estimates only, the IAC considered them appropriate for the current phase of concept design.

Construction techniques and material handling for ASS are well practiced across the construction industry. Given the volume of anticipated ASS, the EES reported that the construction risks associated with ASS were assessed by LXRA as negligible. LXRA proposed an Acid Sulphate Soil Management Plan (CL2) and a Spoil Management Plan (CL1) to manage acidic, contaminated or clean spoil excavated from the trenches. The IAC were comforted by the EPRs closely following the guidance for the management of ASS set out by existing Victorian legislation and supporting policy framework.

Aside from the spoil and ASS management plans called for by CL1 and CL2, the contaminated land EPRs provide requirements for the timely identification and management of environmental effects arising from the projects' interactions with contaminated waste or groundwater. As the IAC points out, the contaminated land EPRs will work in conjunction with the groundwater EPRs (discussed in Section 4.1) to address the risk of acidification during construction or operation of the projects.

Assessment
It is my assessment that the disturbance and activation of PASS will be minimised and contained by the construction techniques proposed by LXRA. Where ASS or PASS are encountered, there are mature and accepted construction techniques to manage the potential impacts. I support the contaminated land EPRs, in principle (with those recommendations included in Appendix A). The EPRs call for monitoring and management plans, spoil management and contaminated groundwater management, in line with regulatory and industry guidance, to be incorporated into the detailed design and operating environment.

4.3 Biodiversity (wetlands and foreshore vegetation)

Biodiversity impacts are addressed in Sections 6 and 8, Technical Reports B and D of the EES. Chapter 10 and 11 of the IAC report address impacts on the Edithvale Wetland and coastal foreshore vegetation, respectively. Eight biodiversity EPRs (FF1-8) were proposed by LXRA with an additional EPR (FF9) recommended by the IAC.

Evaluation objectives
To avoid, minimise and/or offset adverse effects on native vegetation, listed threatened species and ecological communities, listed migratory species, the Ramsar listed Edithvale-Seaford Wetlands, other protected flora and fauna and groundwater dependent ecosystems.

Context
The projects traverse an area currently used for rail and associated infrastructure with almost all original vegetation removed. The ecological values occurring in or around the rail alignment are dominated by small patches of remnant (indigenous) vegetation including Coastal Dune Scrub (Ecological Vegetation Class, EVC 160) and Coast Banksia Woodland (EVC 2). The area also supports planted vegetation in roadside landscaping. The Aspendale to Carrum Foreshore Reserve, adjacent to the projects, supports remnant indigenous vegetation including three EVCs, along with habitat for non-threatened native animal species. The foreshore is an important environmental asset valued by the local community. Native animals in the project areas are typical of suburban environments.

The Edithvale Wetland is located 1.3km from the Edithvale project and 2km from Bonbeach. The wetland is recognised as a matter of national environmental significance (MNES) under the EPBC Act by virtue of its Ramsar listing. The Edithvale Wetland supports native vegetation within eight EVCs and provides important habitat for many bird species, including threatened and migratory species (refer to the IAC report and EES for more information).

Wannarkladdin Wetland is ecologically similar to Edithvale Wetland, although not of international significance and not Ramsar listed. The Wannarkladdin Wetland provides habitat for a number of waterbirds and shorebirds and is part of a nationally significant complex of wetlands (which includes the Edithvale-Seaford Wetlands). The EES reported 10

threatened and/or migratory bird species recorded by Birdlife Australia in the Wannarkladdin Wetland.

The ground surface of the project areas would be cleared during project construction works, with subsequent impacts on remnant indigenous vegetation. A total of approximately 2.2ha of native vegetation and four scattered trees may be removed during construction for the projects. There are no identified impacts on vegetation during the operations phase.

No risks to the Edithvale Wetland, or other groundwater dependent ecosystem, were identified by the EES during the projects' construction phase. An assessment of impacts to groundwater in the project area is provided in Section 4.1.

Discussion

Native flora and fauna

Overall, the project is unlikely to have a significant impact on native vegetation within the projects' areas. The IAC heard submissions from Kingston City Council and Chelsea Bonbeach Station Group about the loss of vegetation from the project areas. I accept the EES' findings that the local vegetation and habitat loss is unavoidable if the projects proceed and note the concerns regarding visual and amenity impacts. The EES indicates that opportunities to retain vegetation might be found during the design process and I urge LXRA to consider this throughout the projects' development. In addition, the IAC recommended some changes to UD1 so that the projects' urban design guidelines must consider "vegetation replacement as a design and development component". I accept the IAC's revised EPR wording.

The EES and IAC note that vegetation removal will result in loss and fragmentation of habitat. However, the reported native animal species present within the project areas are typical of suburban Melbourne with no threatened native animal species found in surveys. The EPRs FF4 and FF6 are adequate to reduce potential impacts on fauna during construction.

Impacts to native animals may also occur from increased noise, light and vibration during construction and operation. The EES and the proposed EPRs for noise, light spillage and other construction management requirements adequately addressed these impacts.

Groundwater dependent ecosystems – coastal native vegetation at Bonbeach

The EES identified a number of GDE's in the wider Edithvale and Bonbeach areas with two meeting the definition of a high value GDE: the Edithvale Wetland and the Wannarkladdin Wetland. The EES and IAC discussed the impact of the projects on both of these GDE's, along with the Aspendale to Carrum Foreshore Reserve where it is likely that the remnant vegetation is accessing groundwater. No risks were identified during the construction phase of the projects, in relation to the GDEs and Aspendale to Carrum Foreshore Reserve.

The greatest risk to GDE's as discussed in the EES is during the operation of the projects, with impacts from groundwater drawdown and/or diminished water quality due to the projects' interaction with groundwater (see Section 4.1).

The foreshore reserve coastal vegetation may be sensitive to both changes in groundwater levels and groundwater quality (such as salinisation). However, the extent to which the vegetation is dependent on groundwater for survival is unknown and difficult to measure. The IAC acknowledge the uncertainty of potential impacts from groundwater changes on the foreshore vegetation, highlighting that at Bonbeach due to the absence of a design mitigation there is a greater degree of groundwater drawdown expected.

The residual risk on foreshore vegetation remains as minor at Bonbeach and negligible at Edithvale. However, the IAC agree with the LXRA and Kingston City Council that it is important to improve the resilience of the foreshore vegetation to reduce the significance of any potential impacts arising from changes in groundwater levels or quality. This is proposed to be undertaken through two EPRs, FF7 relating to the monitoring of foreshore vegetation

and FF9 which outlines the funding arrangements to enhance foreshore vegetation at Bonbeach.

During the hearings LXRA and the City of Kingston proposed different versions of an offset-like EPR for the foreshore vegetation, thus removing the specific requirement to monitor foreshore native vegetation. The IAC does not support this proposal, instead recommending that a more general EPR (see FF9 IAC version in Appendix A) relating to offset payment, in addition to the preparation of a monitoring and mitigation plan for foreshore vegetation that is closely linked to the groundwater monitoring (GW3).

I support FF9 proposed by the City of Kingston and endorsed by the IAC, as the calculation provided by the LXRA version of FF7 is too specific for a performance requirement and removes the flexibility if the impacts or detailed design changes. Moreover, the foreshore vegetation may not be impacted by the proposed trench at Bonbeach, and it is premature to describe an EPR that relates to the cost of acquiring native vegetation when there may be separate requirements pursuant to the *Guidelines for the removal, destruction or lopping of native vegetation (DELWP, 2017)* under the incorporated document for native vegetation.

The IAC supported evidence heard that *the monitoring of foreshore vegetation should commence at the outset and not be delayed until a significant change in groundwater becomes evident.* However, this monitoring should be closely integrated with groundwater monitoring to isolate changes in groundwater from the effects of other pressures on the foreshore vegetation (as was originally proposed in FF7). Therefore, I support the IAC's recommendation that foreshore vegetation should be closely monitored at the outset of the project and at the same time as groundwater monitoring under GW3 and CL5.

The IAC concluded that the Foreshore Vegetation Groundwater Dependent Ecosystem Monitoring and Mitigation Plan should be prepared at the outset and should be publicly available. The entities responsible for the preparation, approval and implementation of the plan should be identified. I agree with this recommendation and endorse the management approach of the EES, that the plan as outlined in FF7 will include contingency measures to be implemented only if trigger levels for changes to groundwater level and quality were identified by the groundwater monitoring program.

Groundwater dependent ecosystems – Edithvale-Seaford Wetlands
The Edithvale Wetland was assessed in the EES for potential impacts resulting from groundwater mounding and/or water quality impacts. The IAC supported the findings of the EES along with the expert evidence called during the hearings that there would be no change in the ecology of both the Edithvale Wetland and the Wannarkladdin Wetland as a result of the projects. Construction impacts are not expected to extend to the Edithvale Wetland, which is further than 1km from the projects. During operations the potential impacts of the projects on groundwater will likely vary with seasonal changes in recharge and evaporation and will depend on the proposed groundwater management system at Edithvale.

The IAC acknowledged uncertainty in potential groundwater impacts and emphasised the importance of developing a Monitoring and Mitigation Plan for the Edithvale and Wannarkladdin Wetlands as proposed in EPR FF8. I agree with this proposed approach and I note the high conservation value of the Edithvale and Wannarkladdin Wetlands, along with the strong connection that the local community and friends group place on these sites.

The IAC discussed the requirements of the wetland monitoring and mitigation plan (FF8), with different approaches to this EPR presented during the hearings. It is important to understand the mechanics of the proposed monitoring program, and importantly the roles and responsibilities that may extend beyond the life of LXRA. In addition, there is a balance between the content of EPRs and the descriptors that must be provided in the body of the EMF itself, in order to provide flexibility to respond to unexpected impacts. I agree with the IAC that the monitoring program for the wetlands should include the Wannarkladdin Wetland, due to the environmental and social value it generates.

The detailed structure of the wetland monitoring and mitigation plan (FF8) including any data or gap analysis, monitoring requirements, criteria for determining triggers for mitigation response should be outlined in the EMF to be submitted for my approval. Integration of this plan with any changes in groundwater levels (see GW3 and CL5) will provide the best potential for detecting early warning signs of wetland degradation, due to the project, and timely intervention.

I agree with the IAC that the LXRA should be responsible for preparing and funding the implementation of FF8, in consultation with DELWP, the Commonwealth Government, Melbourne Water and Kingston City Council. The plan must detail what agency will bear responsibility for the ongoing monitoring, periodic reporting and mitigation implementation (if required) along with arrangements for transfer of the monitoring assets.

Matters of Commonwealth interest

The EES identified three MNES that are potentially at risk from the projects, the Ramsar listed Edithvale-Seaford Wetlands, threatened species and migratory species listed under the EPBC Act. The EES concluded that significant impact on MNES is unlikely based on a number of reasons as summarised by the IAC in Section 17.2.2:

- *the absence of suitable habitat for threatened and/or migratory species within and immediately adjacent to the project areas;*
- *the distance between the project areas and high value GDEs which are known to support threatened and/or migratory species – the Edithvale and Wannarkladdin Wetlands are over 1km from the project areas and the EES determined that they are beyond the area of influence of direct disturbance; and*
- *no impact on groundwater levels at the Edithvale or Wannarkladdin Wetlands is shown by the groundwater modelling.*

The listed threatened species and communities under the EPBC Act that could be significantly affected by the projects are discussed in Chapter 17 of the IAC report and summarised in Table 3. Expert evidence presented to the IAC maintained that is unlikely that construction works undertaken for the projects will have a significant impact on MNES. In addition, as outlined in the discussion above, no alteration to the groundwater regime is predicted to affect the Edithvale-Seaford Wetlands. As the hydrology of the wetlands is unlikely to be unaffected, I support the conclusions of the EES and the IAC that it is unlikely that the ecology of the site would be impacted. However, taking a precautionary approach, a monitoring and mitigation plan must be implemented (FF8) with contingency measures in place, to further reduce any risks to the Ramsar site and therefore any other MNES that utilise the wetlands.

Table 3: Matters of national environmental significance listed under the EPBC Act.

MNES	IAC findings and recommendations
Ramsar wetlands Edithvale-Seaford Wetlands	The projects are not expected to have impacts that exceed the limits of acceptable change for the Ramsar listed Edithvale-Seaford Wetlands. Direct impacts during construction are highly unlikely due to the distance of the project areas to the wetland. The EPRs provide for monitoring and mitigation of adverse impacts on the Edithvale Wetland if they arise (CL2, CL4-5, FF8, GW1-5).
Threatened species River Swamp Wallaby-grass Swamp Everlasting Australasian Bittern Curlew Sandpiper Bar-tailed Godwit Australian Painted Snipe Grey-headed Flying-fox	No significant impacts on threatened species are predicted as there are no changes likely in the ecological character of the Edithvale and Wannarkladdin Wetlands. Direct impacts during construction are unlikely due to the distance of the projects to the wetlands. The EPRs provide for monitoring and mitigation of impacts on the ecological character of the wetlands if they arise, as well as construction practices to minimize impacts of light and noise pollution (AQ1-2, CL1-3, FF3, FF8, LV2-3, NV1-3).

/cont.

Table 3 (cont.): Matters of national environmental significance under the EPBC Act.

MNES	IAC findings and recommendations
Listed migratory species Sharp-tailed sandpiper Latham's Snipe Curlew Sandpiper Bar-tailed Godwit	No significant impacts on migratory bird species as there are no predicted changes in the ecological character of Edithvale and Wannarkladdin Wetlands. Direct impacts during construction are highly unlikely due to the distance of the project areas to the wetland. The EPRs provide for monitoring and mitigation of impacts on the ecological character of the wetlands if they arise, as well as construction management practices to minimize impacts of light and noise pollution (AQ1-2, CL1-3, FF3, FF8, LV2-3, NV1-3).

Assessment

It is my assessment that significant groundwater mounding caused by the projects is unlikely to extend to the Edithvale or Wannarkladdin Wetlands, and the risk is further reduced after mitigation measures are applied at Edithvale. As a result, impacts from the projects on other MNES that utilise the wetlands are unlikely, with standard construction management practices reducing the risk of noise and light pollution.

Elsewhere, impacts to native vegetation within the project areas would be adequately mitigated, managed or offset via the EPRs FF1-6. I agree with the IAC that ongoing monitoring should be deployed to ensure that unforeseen impacts of the projects on biodiversity and social values of the coastal strip and the Edithvale and Wannarkladdin Wetlands can be mitigated (FF7-8). LXRA should detail the future roles and responsibilities for the ongoing implementation of the plan.

In addition to the above, I support the IACs recommended EPR FF9 to fund a program to enhance the resilience of the foreshore native vegetation community at Bonbeach. I have outlined my recommended modifications to EPRs in Appendix A

4.4 Construction impacts

In line with my reasons for decision, the EES focused on potentially significant effects of the projects, that were related to the groundwater regime, Edithvale-Seaford Wetlands and interception of potential acid sulphate soils. Therefore, there is no draft evaluation objective for localised impacts realised during construction and operation.

The EES and the IAC discussed other potential effects on the social or environmental setting including construction noise, traffic and transport and visual amenity impacts. I support the findings of the IAC that generally these localised impacts can be appropriately managed through the EMF and associated EPRs. Together these mechanisms will outline how potential adverse effects on the community and businesses, with regard to air quality and noise, traffic, public safety, landscape and visual amenity, open space, built form and neighbourhood character will be avoided, minimised or mitigated.

Table 4 outlines how each of these localised impacts were assessed and discusses the overall significance of impacts against the management regime proposed. Generally, I support the findings of the EES and IAC in relation to construction impacts. It is my assessment that the impacts can be effectively managed through well-established practices include comprehensive EPRs and a robust EMF. I offer recommendations for refining the EPRs in Appendix A.

Table 4: Other social and environmental impacts.

Issue	IAC findings and recommendations	EPRs
Air quality	The EPRs call-up measures for the control of dust generation to meet regulatory standards. Impacts from dust, combustion and odour to human health, amenity and the environment can be suitably managed, where the current residual risk rating is estimated as negligible.	AQ1-2

/cont.

Table 4 (cont.): Other social and environmental impacts.

Issue	IAC findings and recommendations	EPRs
Historic and Aboriginal cultural heritage	The likelihood of impacting historic and Aboriginal cultural heritage through construction disturbance was assessed in the EES, with no direct impacts predicted. I support the IACs findings that the cultural heritage EPRs will adequately mitigate any potential impacts and too note that a cultural heritage management plan will be prepared for the projects outlining the steps to protect and manage Aboriginal cultural heritage.	AH1 HH1-3
Noise	Operational rail noise is likely to be reduced from the rail trench placement and rail vibration would be unlikely to be significant. NV1 will ensure design is in accordance with the Passenger Rail Infrastructure Noise Policy 2013. The IAC had no further recommendations. Construction noise and vibration is expected to impact upon sensitive uses during the main construction period. I support the IAC's findings that scheduling higher disturbance works in consultation with the community and limiting noisy works are critical to reducing amenity impacts during the works. I emphasise the importance of the EPRs in managing impacts on the community from construction noise and support the inclusion of SC2 and SC3 providing for respite/relocation for both residents and users of recreation facilities during construction.	NV1-3 SC1-3
Surface water	Construction impacts such as run off from laydown areas can be managed through the applicable EPRs SW1, SW3 and SW5. The IAC noted that the existing drainage network has little capacity to support any increases to the drainage network as a result of the projects. The storm water disposal methods proposed by LXRA have the ability to link with City of Kingston's existing systems, and I support the IAC's conclusion that operational impacts can be managed via the proposed EPRs with minor amendments.	SW1-6
Traffic and Parking	Level crossing removal will remove safety risks to trains, vehicular traffic, cyclists and pedestrians. Generally, traffic congestion will improve in the wider area, however, intersection performance at Edithvale and Bonbeach may not cater for efficient traffic movement. Removal of on-road bicycle paths and pedestrian crossing locations were subject to discussion by submitters and the IAC. The IAC highlighted the importance of T3 which aims to maintain and enhance pedestrian and cyclist connectivity, I too strongly support the optimisation of the design in consultation with Kingston City Council in particular to ensure the local community is included and supported in the final design outcome. Parking was the topic of several submissions, with concerns that commuter demand will increase after the projects. The IAC were concerned that the LXRA are not seeking to increase vehicle parking, and that close consultation should occur between relevant road agencies.	T1-T8
Visual impact	Visual impacts resulting from the projects were discussed by a number of submitters, with urban design the subject of evidence during the hearings. The IAC did not recommend making any changes to the EES version of the UD EPRs and finds the assessment of the EES appropriate in regard to visual impacts. I support the inclusion to UD1 to ensure the urban design guidelines consider vegetation as a design tool and climate change.	UD1-2
Other	Other impacts that may arise during construction include on: • Businesses through amenity impacts such as noise and vibration, traffic management and dust. The IAC support the findings of the EES, that the risk is considered minor through the requirement for B1 the development of a business disruption plan. • Ground movement and settlement will be managed through GM1-2. • Land use and planning however a number of construction EPRs including specifically LP1 aims to reduce disruption or avoid/minimize impacts to existing land uses.	B1 GM1-2 LP1

5 CONCLUSION

My overall conclusion is that the projects can be built and operated with acceptable environmental effects, subject to my approval of an amended Environmental Management Framework.

The excavation of rail trenches and balance of construction works will impact the local environment and will disrupt the lives of people who live and work nearby. However, the benefits to the community will manifest when the projects begin operating. During construction, a raft of typical construction management practices, documented through the EPRs will ensure communication between the constructors and the public, and see a range of mitigations applied to reduce the impacts of works.

Over the long-term, the rail trenches will interact with local groundwater flow. Without management, the projects pose a risk of water logging, activation of acid sulphate soils, increase in the salinity of groundwater and the loss of potentially groundwater dependent coastal vegetation. However, I am satisfied that there are engineering solutions that can be deployed readily to prevent impacts to the groundwater flow regime.

The risk of impacts to the Ramsar listed Edithvale-Seaford Wetlands are unlikely and I accept that the projects do not threaten flora and fauna species nor migratory birds via changes in the ecological character of Edithvale-Seaford Wetlands.

The long-term mitigation of the projects' potential environmental effects relies on the continuous operation and utility of the projects' EPRs. Careful and continued monitoring of groundwater and ecological response to the projects is required into the future. The EMF and EPRs must detail the ongoing ownership and responsibility for legacy monitoring equipment and data analysis/reporting along with responsibility for future maintenance and rectification works of the groundwater management system.

HON RICHARD WYNNE MP
Minister for Planning

27/8/18

APPENDIX A: ENVIRONMENTAL PERFORMANCE REQUIREMENTS

The EMF, exhibited with the EES included an extensive list of EPRs. The EPRs were refined by the proponent throughout the course of the IAC hearing in response to submissions and evidence. The proponent tabled 'Version 3' of the EPRs to the IAC on the final day of the hearing. The IAC produced a table at Appendix E of its report, that set out its recommended changes to the EPRs. Both versions of the EPRs are presented in Table A1 (overleaf), along with further recommendations that I have made in my assessment. All versions are presented to provide readers an insight into the evolution of the EPRs over the course of the EES process.