21. Environmental Management Framework

21.1 Introduction

This section presents the environmental management framework that would be in place for the detailed design, construction, and operational phases of the Project. Note that where the conditional tense is used throughout the EES (e.g. the use of the word 'would' rather than 'will'), this is in reference to the possibility that the Project may not be approved and may therefore not proceed. If however, the project does proceed, the environmental management measures outlined in this section will be implemented.

The environmental management framework addresses the matters specified in the EES Scoping Requirements, including:

- *The statutory approvals and consents that will influence Environmental Management Plans and related measures* (refer to Section 21.4 and Chapter 3, Project Approval Requirements)
- *Any Environmental Management System to be adopted (e.g. based on ISO14001:2004), such that organisational responsibilities and accountabilities are clearly defined* (refer to Section 21.5)
- *Proposed environmental management objectives or performance requirements and indicators to guide environmental monitoring and management actions* (refer to Section 21.7)
- *An outline of one or more Environmental Management Plans for the construction and operational phases (including rehabilitation)* (refer to Section 21.5)
- *Options to minimise resource and energy use and waste generation, especially in the selection and sourcing of construction materials and equipment* (refer to Section 21.6)
- *Environmental management measures (in summary form) proposed in the EES to address specific issues, including environmental commitments of the proponent to mitigate adverse effects and enhance environmental performance* (refer to Section 21.7)
- *A proposed program for evaluating environmental outcomes and reviewing and revising Environmental Management Plans, in order to provide accountability and to guide actions to achieve intended outcomes* (refer to Section 21.8)
- *Arrangements for management of and access to baseline and monitoring data, to ensure the transparency and accountability of environmental management as well as to contribute to the improvement of environmental knowledge* (refer to Section 21.8.1).

21.2 Project Delivery

VicRoads is the Victorian statutory authority for arterial roads (including highways and freeways) and is responsible for the overall delivery and operation of the Project. VicRoads would appoint one or more construction contractor(s) who would be responsible for construction works for the Project.

This EES considers two alignment options for the Project. Except where explicitly stated, the environmental management requirements outlined in this chapter apply to both alignment options.

The Project would initially be constructed to AMP3 (highway) standard and later upgraded to AMP1 (freeway) standard. This EES has assessed the overall combined level of impact associated with the 'footprint' (activity area) for both the original AMP3 construction and the upgrade to AMP1. The carriageways would be constructed to AMP1 standard as part of the initial works and hence, works associated with the future upgrade to AMP1 standard would largely be limited to changes to adjoining property access, access roads and grade separated interchanges. The environmental management requirements recommended in this chapter would apply to both the initial construction to AMP3 standard and the upgrade to AMP1 standard.

VicRoads would be responsible for on-going management of the Project post-construction, with key activities comprising ongoing road maintenance. VicRoads may appoint contractors to complete specific maintenance tasks on an as required basis during operation. These contracts would be managed in accordance with VicRoads' practices and standards.

21.3 Roles and Responsibilities

The key roles and responsibilities for the construction and operational phases of the Project are listed in Table 21-1.

Table 21-1 Roles and responsibilities for environmental management

Organisation	Responsibilities
VicRoads Project Director (Superintendent)	The VicRoads Project Director would: ▪ Check that VicRoads' Project Environment Protection Strategy (PEPS) is developed, approved and implemented in accordance with VicRoads requirements. ▪ Check that VicRoads staff are appropriately trained in environmental awareness. ▪ Sign off close-out of environmental incidents.
VicRoads Manager – Project Delivery	The VicRoads Manager – Project Delivery would: ▪ Check that the required actions identified in the PEPS are undertaken. ▪ Check that the PEPS is regularly reviewed and updated as required. ▪ Check that relevant stakeholders are consulted and provide input into the development of the PEPS where appropriate. ▪ Check that non-contractual environmental commitments are actioned. ▪ Obtain all necessary permits for VicRoads as identified.
VicRoads Project Engineers / Surveillance Officers	The VicRoads Project Engineers / Surveillance Officers would: ▪ Prepare the PEPS in accordance with VicRoads internal environmental management guidelines. ▪ Check that the requirements in the PEPS are incorporated into the contract specification for construction. ▪ Check that the requirements of the PEPS and contract specification are addressed by the construction contractor's Environmental Management Strategy (EM Strategy) and Construction Environmental Management Plan(s) (CEMPs) and that they include monitoring, surveillance and auditing. ▪ Log environmental incidents in VicRoads incident reporting system. ▪ Prepare surveillance plans for each construction contract and complete regular assessment/review of the environmental risks and amend the surveillance plan as necessary to reflect the risks. ▪ Conduct surveillance and audits of works to check compliance with the contract specification and the contractor's EM Strategy and CEMP(s). ▪ Record environmental surveillance in the VicRoads Surveillance and Management System (SuMS).
Construction contractor(s)	The construction contractor(s) would: ▪ Develop an EM Strategy and CEMP(s) to the satisfaction of VicRoads Project Director. ▪ Effectively implement and manage the EM Strategy and CEMP(s) to the satisfaction of VicRoads Project Director. ▪ Monitor, audit and conduct surveillance of the implementation and effectiveness of the CEMP(s) and report their effectiveness to VicRoads Project Director. ▪ Engage an independent, suitably qualified and experienced auditor to conduct audits of implementation of the contract specification. ▪ Engage specialist environmental advice where required. ▪ Engage a qualified ecologist to demarcate ecological 'No-go zones' on-site. ▪ Check that all contractual commitments are honoured. ▪ Report environmental incidents to VicRoads Project Director and relevant statutory authorities. Document actions taken to rectify the situation. ▪ Check that all other requirements as described in the contract specification are met. ▪ Inform VicRoads Project Director of any queries from statutory agencies and respond accordingly. ▪ Check that Contractor's staff and subcontractors have been appropriately trained in environmental awareness.

21.4 Statutory Approvals and Consents

VicRoads is responsible for coordinating and obtaining statutory approvals for the Project and ensuring the requirements of these approvals are implemented. VicRoads would require the construction contractor(s) to comply with the conditions of these approvals and obtain any additional licences or permits that may be required for construction.

Key regulatory approvals required for the Project are described in detail in Chapter 3 (Project Approval Requirements). A summary of environmental management requirements arising from these approvals and the mechanisms for implementing these requirements is presented in Table 21-2.

Table 21-2 Summary of key statutory approvals and consents

Approval	Requirements	Responsibility	Implementation
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*	Specific plans for EPBC-listed species would be prepared as required, including a salvage and translocation plan for any EPBC Act-listed flora requiring removal and a Dwarf Galaxias Management Plan.	VicRoads	VicRoads would arrange for an appropriately qualified ecologist to prepare the plans. Any conditions or requirements would be incorporated into the PEPS and addressed by either VicRoads or through the construction / maintenance contracts as appropriate.
Cultural Heritage Management Plan pursuant to the Victorian *Aboriginal Heritage Act 2006*	VicRoads has commissioned preparation of a draft Cultural Heritage Management Plans (CHMP) for the Project in accordance with the requirements of the *Aboriginal Heritage Act 2006*. Each CHMP would be finalised for evaluation by the relevant Registered Aboriginal Party (RAP) after the Minister's Assessment of the EES has been issued.	VicRoads	Specific commitments made in the CHMPs would be incorporated into the PEPS and addressed by either VicRoads or through the construction / maintenance contracts as appropriate.
Planning Scheme Amendment pursuant to the *Planning and Environment Act 1987*	A draft Planning Scheme Amendment has been placed on public exhibition concurrently with this EES.	VicRoads	Condition outlined in Sections 5.2 and 5.3 of the Incorporated Document forming part of the Planning Scheme Amendment would be incorporated into the VicRoads PEPS and addressed by either VicRoads or through the construction / maintenance contracts as appropriate.
Victoria's Native Vegetation Management: A Framework for Action	VicRoads would prepare an Offset Management Strategy to satisfy requirements under Victoria's Native Vegetation Management: A Framework for Action (DNRE 2002).	VicRoads	Conditions and requirements from the Offset Management Strategy would be incorporated into the VicRoads PEPS and addressed by VicRoads.
Flora and Fauna Guarantee Act 1988 and *Wildlife Act 1975*	A Salvage and Translocation Plan, adhering to best practice protocols, would be prepared prior to commencement of works, including for the FFG-listed species Brown Toadlet, Brown Treecreeper and the Victorian Temperate Woodland Bird Community. *A Flora and Fauna Guarantee Act* permit would be sought to remove listed flora species. A permit under the *Wildlife Act* would be sought to remove/translocate fauna species.	VicRoads	VicRoads would arrange for an appropriately qualified ecologist to prepare the plan. Any conditions or requirements of the plan or permits would be incorporated into the VicRoads PEPS and addressed by either VicRoads or through the construction / maintenance contracts as appropriate.
Licence to construct works on a waterway under Division 2 of the *Water Act 1989*	A permit for works on waterways would be sought from the issuing authority Glenelg Hopkins Catchment Management Authority (CMA).	VicRoads	Any conditions or requirements would be incorporated into the VicRoads PEPS and addressed by either VicRoads or through the construction / maintenance contracts as appropriate.

21.5 Environmental Management Documentation

21.5.1 Structure

The structure of the Environmental Management documentation is shown in Figure 21-1. These documents are described in detail in the following sections.

As stated in Table 21-1, VicRoads will consult relevant agencies including DSE and local councils in the preparation of the PEPS.

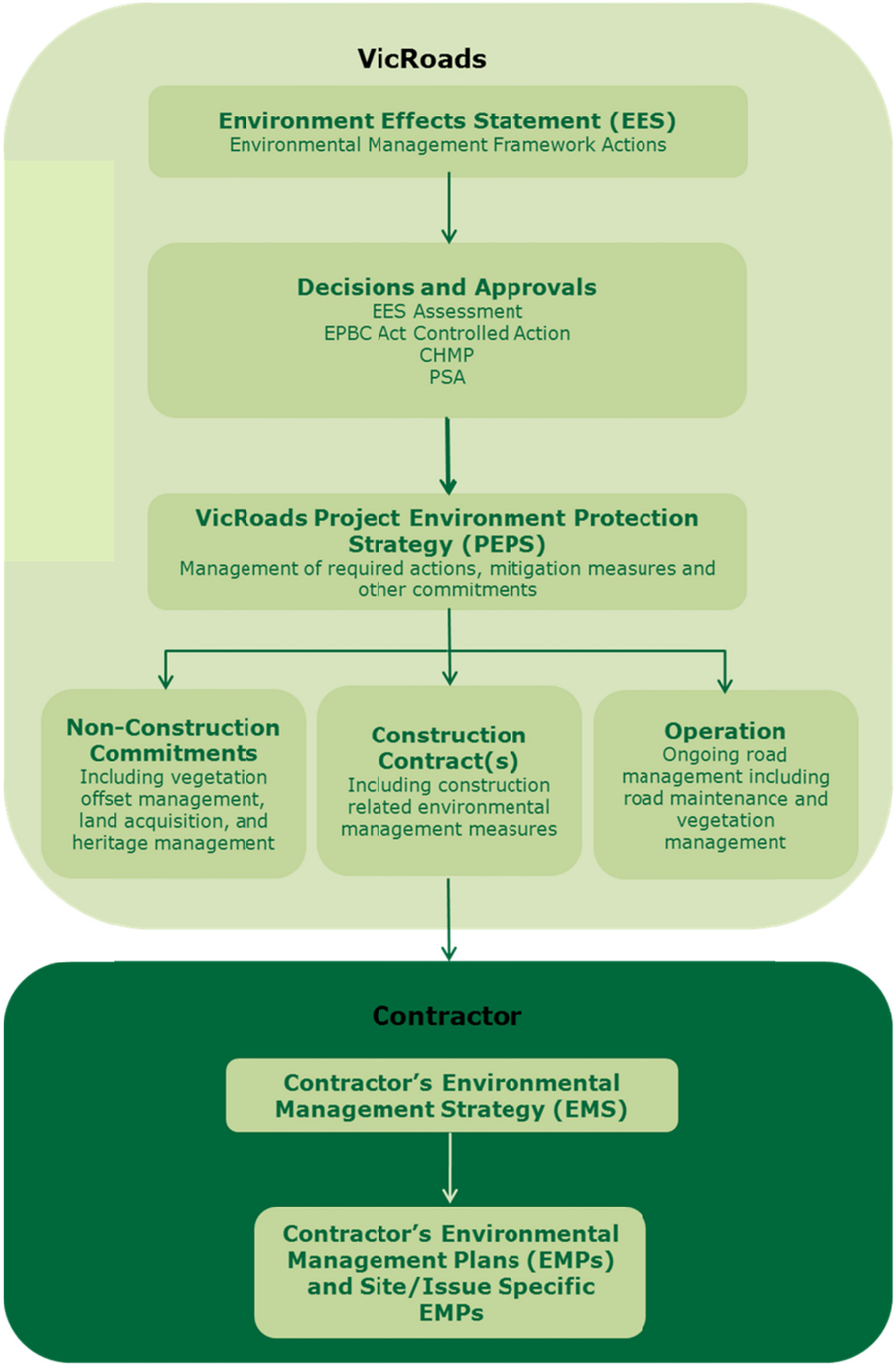


Figure 21-1 Environmental management structure

21.5.2 VicRoads Documents

Project Environment Protection Strategy

VicRoads would develop a PEPS that details the environmental management arrangements for the detailed design, construction and operation of the Project. The PEPS would be a VicRoads document and would be used by VicRoads to guide environmental management for the project and to track implementation of overall environmental commitments and approval conditions.

VicRoads would conduct a project risk assessment as part of the PEPS. This risk assessment would be based on the EES risk assessment and updated periodically to reflect the project status and any new information.

The PEPS would also contain an action plan and commitments table to deliver on all environmental management measures and objectives as described in this EES and any other measures or commitments identified through the Minister's assessment and conditions of subsequent approvals and consultation. The PEPS would include a summary of commitments made in key management plans and approval documents outlined in Table 21-2.

Contract Specification

VicRoads would prepare a construction contract specification(s) for the Project containing the requirements for the construction contractor(s). VicRoads has a standard contract specification that contains clauses for environmental management. This standard contract specification has been adopted for this Project with relevant requirements detailed in Section 21.7. Additional environmental management and monitoring requirements identified by this EES and through ancillary approvals processes would be incorporated into the contract specification(s) as relevant.

The standard VicRoads contract specification(s) includes the requirement for the construction contractor(s) to prepare a documented project EM Strategy and CEMPs for the Project. The contract specification would also require the construction contractor(s) to comply with relevant requirements from the approval documents outlined in Table 21-2.

21.5.3 Contractor Documents

Environmental Management Strategy

The construction contractor(s) would be required to develop and implement, to the satisfaction of VicRoads, a documented project EM Strategy that is consistent with ISO 14001:2004 'Environmental management systems – requirements with guidance for use' for detailed design and construction. This EM Strategy would be a project specific document and developed in addition to any organisation-specific Environmental Management System that the contractor(s) may have in place.

Major elements of the EM Strategy would be expected to include as a minimum:

(a) the purpose and objectives of the EM Strategy;

(b) a schedule of environmental values that are expected to be affected by the works under the Contract including an outline of proposed mitigation treatments and proposed timeframes;

(c) processes and responsibilities for -

- reviewing and updating the EM Strategy.
- the development, implementation, onsite review and maintenance of CEMPs and associated controls.
- independent verification and auditing of CEMPs.
- reporting and investigation of environmental incidents or complaints relating to any environmental issue under the Contract.
- an adaptive approach for the review and update of the CEMP(s) as works progress and/or following non-conformances, complaints, or previously unidentified issues.
- after hours response including arrangements for containing environmental damage and attendance on site in the event of an emergency.
- general reporting of environmental issues and project progress to VicRoads.

(d) requirements of all relevant statutory authorities including necessary approvals and permits;

(e) arrangements for site induction and training to check that all relevant personnel are aware of the requirements of the EM Strategy and the requirements of specific CEMPs; and

(f) arrangements to check that all subcontractors comply with the requirements of the EM Strategy and the requirements of specific CEMP(s).

In preparing the EM Strategy the construction contractor(s) would consult with the Environment Protection Authority and other relevant authorities. The CEMP(s) would be developed with reference to the Environment Protection Authority's Publication No. 480, '*Environmental Guidelines for Major Construction Sites'* and any specific requirements of relevant authorities.

Construction Environment Management Plans

The construction contractor(s) would be required to prepare CEMP(s) for construction taking into account:

- The site's environmental features.
- The nature of the works to be undertaken.
- Any potential environmental impacts as identified in the PEPS.
- Activity specific environmental risks and potential environmental impacts identified through the risk assessment process.
- Permits and/or approvals and related conditions.
- The findings of environmental investigations undertaken by or on behalf of VicRoads.
- The results of any environmental investigations undertaken by the construction contractor(s).

The construction contractor(s) would be required to complete activity specific risk assessments as part of preparation of the CEMP(s). These risk assessments may be in the form of Job Safety and Environmental Analyses, with identified environmental controls to be incorporated into specific construction work packages and/or design.

The CEMP(s) would also be required to address works associated with any rehabilitation activities required as part of the Project such as removal of redundant infrastructure.

The CEMP(s) would be required to address potential environmental impacts to:

- Planning and land use
- Traffic and transport
- Soils and geology (including potential for acid sulfate soils)
- Groundwater
- Surface water
- Biodiversity and habitat
- Cultural heritage
- Air quality
- Noise and vibration
- Visual and landscape
- Social
- Economic
- Matters of State and National Environmental Significance.

The construction contractor(s) may choose to address these within one CEMP covering all potential environmental impacts or as separate sub-plans for potential impacts to each environmental value.

Components of Construction Environmental Management Plan(s)

Each CEMP shall incorporate the following:

(i) a statement of scope and purpose.

(ii) identification of work activities and an assessment of potential impacts and associated risks to onsite and offsite environmental receptors (e.g. community, land uses, waters, flora and fauna, cultural heritage, etc.), including times when the Contractor is not on site.

(iii) details of control measures to address the identified environmental risks, including but not limited to -

- design measures and construction techniques to be implemented to protect the environment and/or avoid environmentally sensitive areas and unnecessary vegetation and habitat removal;
- detailed drawings that clearly show the location and extent of environmental controls, no-go zones, modifications to existing control devices, effects on permanent works, and monitoring locations;
- specific procedures to address identified environmental risks;
- emergency response plans that include immediate measures to be adopted/implemented in the event of an environmental incident or failure of environmental control measures, and reporting requirements;
- resources, roles, responsibility and authority – details of staff involved in the approval, implementation and onsite review and maintenance of the CEMP; and
- hierarchical contact list – in the case of unforseen impacts, or any deviation from the CEMP.

(iv) details of implementation of control measures, including but not limited to -

- duration of activity/risk, and timeframes for implementation and removal of control measures;
- frequency and responsibilities for inspection and maintenance of controls including proactive reviews e.g. prior to rain events or changes in construction program;
- process for reviewing the effectiveness of the control measures including arrangements for implementing changes; and

- details of how control measures would be removed.

(v) details of procedures and monitoring measures for environmental values, which shall address the environmental requirements of the contract specification.

(vi) documentation associated with the CEMPs, including:

- records of implementation of the environmental control measures, and monitoring of environmental values;
- a checklist to demonstrate that each environmental requirement in the contract specification has been addressed in the CEMP(s); and
- a requirement for VicRoads ecological consultants to be contacted to record / calculate any additional losses of native vegetation not originally accounted for, and for the Department of Sustainability and Environment to be consulted accordingly.

Site/Issue Specific Construction Environmental Management Plans

Site/issue specific CEMPs may be prepared for environmental values, locations or activities identified as having high or critical environmental risks associated with them.

The following issue specific plans would be prepared to address risks identified in the EES. The required content for these is described in more detail in Section 21.7.

- Traffic Management Plan (refer section 21.7.2)
- Acid Sulfate Soil (ASS) Management Plan (if ASS are identified) (refer section 21.7.3)
- Groundwater Management Plan (refer section 21.7.4)
- Weed and pathogen management and control plan (refer section 21.7.6).
- Conservation Management Plan for any significant flora, fauna and ecological communities likely to be impacted by construction activities (refer section 21.7.6)

21.6 Resource, Energy and Waste Minimisation

VicRoads has a *Sustainability and Climate Change Strategy 2010-2015* that outlines various ways for it to reduce its impact on the environment. In the context of this project, the section on *Reduced Greenhouse Gas Emissions from Road Construction* of Direction 1 – *Reducing Environmental and Climate Change Impacts from the Built Environment* : Objective 1.1 – *A Reduction in Greenhouse Gas Emissions from the Road Network* applies. As part of this objective VicRoads would encourage the use of low emissions materials. VicRoads is also supporting the reduction in the demand for primary aggregate and is undertaking research and development into the use of alternative processes for road construction and maintenance.

The Environment Management measures in Section 1200.10 of the basic Contract Specification state:

The generation of waste materials shall be minimised and where possible resources shall be recovered, reused or recycled. The Contractor shall be responsible for the management of any waste produced in performing the work under the Contract or otherwise.

All work under the Contract shall comply with the following requirements:

- *the nature of wastes generated as a consequence of works under the Contract shall be identified;*
- *wastes shall be stored prior to reuse or disposal to minimise any impact on the Site or surrounding environment;*
- *where approval is granted to incorporate recycled materials into the Works, the Contractor shall maintain appropriate records of the type of material and its location. In particular, records shall include the tonnage of recycled crumbed rubber used in asphalt pavements and chip seal works and all recycled crushed concrete used in pavement construction; and*
- *vehicles transporting waste shall be covered and appropriately licensed.*

This requires that the Contractor(s) reuse as much material as is practicable.

Opportunities where the project would minimise its resource and energy use include:

- Ensuring that the equipment selected is of the appropriate size and capacity;
- Use, where applicable, of alternate building materials, i.e. recycled concrete and asphalt;
- Use 'low carbon footprint' materials;
- Minimising idle time of equipment;
- Minimising import of fill material and utilising as much of onsite material as possible;
- Reuse of as much of the existing pavement as possible within design parameters; and
- Use of non-potable water in lieu of potable water for construction works.

Construction generated waste would be minimised by:

- Reducing the removal of existing pavements;
- Using materials that can ultimately be recycled;

- Specifying the correct quantity of materials when ordering; and
- Reuse of surplus materials onsite, i.e. mulching of removed trees for landscaping works.

Where waste cannot be avoided or reused onsite it would be separated into 'type' for transport to an appropriate waste or recycling facility.

21.7 Environmental Management Measures

The VicRoads standard construction contract specification for road and bridge works contains a comprehensive set of environmental protection measures. This construction contract specification is tailored for each project and site conditions and hence the extracts of the contract included in this EES chapter are provided only as an indication of the content and format of the specification. "Hold points" are noted in the contract specification at key stages where the contractor(s) is required to seek VicRoads' approval prior to proceeding with works.

Additional project specific environmental management and monitoring measures have been identified by this EES to further reduce risk. These are discussed in detail in the previous chapters of this EES and specialist impact assessment reports in the EES appendices. Environmental management measures in this section provide a summary of both the relevant extracts of the VicRoads standard construction contract specification (that would be adopted for the project) and management measures to address specific risks as identified by this EES (that would be included in the contract specification as 'special clauses').

This section also documents environmental objectives and indicators to guide environmental performance during construction. Objectives have been developed with consideration to the EES Scoping Requirements, relevant environmental legislation and potential environmental impacts associated with the project. Indicators have been developed to measure the effectiveness of proposed environmental management measures with respect to environmental objectives. Indicators may relate to one or more environmental objectives

21.7.1 Planning and Land Use

Table 21-3 Planning and land use objectives and indicators

Objectives	Indicators
▪ Minimise disruption and other effects to infrastructure, land use and households during construction ▪ Minimise residual effects on land use post-construction	▪ Community has been consulted prior to, during and following works ▪ Compensation provided in accordance with *Land Acquisition and Compensation Act 1986*

Table 21-4 Relevant clauses from VicRoads Contract Shell DC1

Clause	Description
1140	**Relationships with Others**
1140.01	Co-operation with Others
1140.02	Works affecting Rail Infrastructure
1140.03	Utility Services
1210	**Community Interactions**
1210.01	Community Liaison
1210.02	Publicity
1210.03	Community Issue Resolution

Table 21-5 Planning and land use summary management measures

Risk No	Risk Description	Management Measures	Responsibility
PLU1	The Project affects existing infrastructure provision	Relocation of the assets would be undertaken in accordance with provider requirements. Where practicable, assets would be kept within the road reserve. Easements would be sought in private freehold property as necessary. Services to be located outside of clear zone where within the road reserve. Relocation of assets would be undertaken in accordance with VicRoads Contract Shell requirements 1140.02, 1140.03	VicRoads

Risk No	Risk Description	Management Measures	Responsibility
PLU2 & 3	The Project has a potential long term and short term impact on land for farming purposes	Alternate access arrangements would be made. Compensation would be paid to landowners associated with the loss of land and impact on farming operations. Allotments would be consolidated where possible in the one landownership.	VicRoads
PLU5	The Project is inconsistent with the Pyrenees and Ararat Planning Schemes	Inappropriate development of allotments is controlled by Clause 22.01 of the Pyrenees Planning Scheme. Consideration would be given to consolidation of allotments where appropriate.	Pyrenees Council VicRoads

Western Highway, Buangor – looking east

21.7.2 Traffic and Transport

Table 21-6 Traffic and transport objectives and indicators

Objectives	Indicators
▪ Improve accessibility and road safety ▪ Reduce transport delays and costs ▪ Improve road network connectivity and efficiency ▪ Minimise the impact on local landowners and the community during construction	▪ Reduced number of casualty crashes ▪ Reduced travel times ▪ Community complaints relating to traffic management during construction ▪ Road safety audit findings

Table 21-7 Relevant clauses from VicRoads Contract Shell DC1

Section	Description
1160	**Traffic Management**
1160.01	General
1160.02	Definitions
1160.03	Performance Requirements
1160.04	Traffic Management Plans
1160.05	Traffic Guidance Schemes
1160.06	Traffic Management Plan Audits
1160.07	Emergency Closures
1160.08	Vertical Clearance for Bridgeworks over Roadways

Table 21-8 Traffic summary management measures

Risk No	Risk Description	Management Measures	Responsibility
T1	Changed road environment during construction results in general reduction to road safety. Examples of road environment changes include heavy vehicles entering/exiting construction accesses, additional or closer roadside hazards, variable speed limits, unfamiliar conditions. Impacted road users include private vehicles, public transport, school buses, cyclists and pedestrians.	Contractors to have TMPs for the construction works prepared. TMPs to comply with standard VicRoads practices, the Traffic Management Code of Practice and the *Road Management Act 2004*. TMPs to be reviewed by VicRoads prior to implementation. Road Safety Audits (RSAs) to be undertaken on TMPs. Construction vehicles would generally avoid local roads. Haulage routes for construction traffic and heavy vehicles to be appropriately designated and managed as part of TMPs, with consideration for safety. Implement a communication strategy with the key stakeholders to manage impacts, and inform road users and the community.	VicRoads/ Contractor(s)
T2	Changed road environment during construction results in general reduction to performance and efficiency of travel modes. Impacted users can include private vehicles, public transport, school buses, emergency services, cyclists, pedestrians and rail.	Contractors to have TMPs for the construction works prepared. TMPs to comply with standard VicRoads practices, the Traffic Management Code of Practice and the *Road Management Act 2004*. TMPs to be reviewed by VicRoads prior to implementation. Road Safety Audits (RSAs) to be undertaken on TMPs. Buses would be provided for rail users in the event that rail operations are temporarily suspended (in consultation with Public Transport Victoria, bus and rail operators). Construction to be staged to allow one carriageway to be operational at all times and traffic flow not to be stopped for any extended period of time. Appropriate consideration to be made in non-motorised road users (ensuring connectivity is not removed), public transport, school buses, emergency services and rail interfaces. This would include: ▪ Local community, Department of Transport and other relevant stakeholders (such as transport operators) consulted and informed of likely disruption due to construction, including impacts to public transport and school bus services. ▪ Haulage routes for construction traffic and heavy vehicles appropriately designated and managed as part of TMPs, with consideration for road	VicRoads/ Contractor(s)

Risk No	Risk Description	Management Measures	Responsibility
		operations. ▪ Impact on travel times as a result of TMP implementation to be analysed prior to, and assessed during, construction. Implementation of alternative TMP measures to be considered during construction if impacts on operations are determined to be unacceptable. ▪ Where possible schedule construction works to minimise the impacts at public holidays, school holidays or other times when the Western Highway would reasonably be expected to experience higher levels of demand and to minimise impacts on key user groups. ▪ Communication between construction teams from each section and integration of Traffic Management Strategies.	
T3	The duplication disrupts/severs local access routes including cyclist connectivity post-construction (interim and ultimate access upgrades) leading to economic and social disruption through increased travel times and reduced accessibility. Vehicle traffic, public transport, school buses, emergency services, cyclists, pedestrians, rail crossings and private access affected.	Design to maintain access to side roads and properties under interim and ultimate upgrade arrangements. Local community and stakeholders to be engaged and informed of positive project outcomes as part of broader community consultation process to address perceptions of localised adverse impacts. Signage and design to allow cyclists to continue to use the shoulder of the highway such that it meets the road rule 95(2) requirements. Possible compensation through the *Land Acquisition and Compensation Act.*	VicRoads/ Contractor(s)
T4	There is potential for some aspects of road safety under interim access arrangements to be degraded, leading to increased incidence of accidents. For example: ▪ Increased distance for farm machinery to be travelling along the road. ▪ Changes in atmospheric conditions i.e. fog, sunglare. ▪ Movements at intersections and property accesses that are retained.	Road safety audit completed for the design. Assess wildlife corridors and identify mitigation measures to reduce wildlife crossing the Western Highway via trafficked carriageway. Assessment of atmospheric conditions within the study area.	VicRoads/ Contractor(s)
T5	Potential for some aspects of road safety under interim and ultimate access arrangements to be degraded leading to increased incidence of accidents. For example: ▪ Increased crossing distance for wildlife exacerbates frequency of accidents. ▪ Increased distance for farm machinery to be travelling along the road. ▪ Changes in atmospheric conditions i.e. fog, sunglare.	As per risk T4.	VicRoads/ Contractor(s)
T6	Potential for some aspects of road safety to be degraded through inadequate design, including horizontal and vertical geometry, sight distance at all intersections and merge locations (ramps and service road entry/exit) leading to increased incidence of accidents. This may lead to increased incidence of accidents.	As per risk T4.	VicRoads
T7	Traffic volumes significantly increase due to increased demand, causing congestion and leading to increased travel time for road users (for the interim and ultimate upgrades).	Risk is negligible and therefore there are no mitigation measures recommended to manage the risk.	NA

21.7.3 Geology and Soils

Table 21-9 Geology and soils objectives and indicators

Objectives	Indicators
▪ Comply with the State Environment Protection Policy (Prevention and Management of Contamination of Land) ▪ Minimise impacts on soil stability, erosion, and exposure and disposal of waste or hazardous soils ▪ Identify and manage any Acid Sulfate Soil (ASS) in accordance with the Industrial Waste Management Policy (Waste Acid Sulfate Soils)	▪ All contaminated materials are identified, stored, treated in accordance with State Environment Protection Policy (Prevention and Management of Contamination of Land) and disposed of at EPA licensed facilities ▪ Erosion and sediment controls installed and maintained in accordance with EPA Best Practice Environmental Management - Environmental Guidelines for Major Construction Sites (1996) and EPA Construction Techniques for Sediment Pollution Control (1991) ▪ Potential for ASS assessed prior to commencing works. Disturbance of ASS avoided if possible. ASS Management Plan prepared and implemented (if required)

Table 21-10 Extract of VicRoads Contract Shell DC1, Section 1200 Environment Protection

Section	Description
1200.08	**Erosion and sediment control**
(a)	General All exposed surfaces shall be free of erosion. Soil conservation measures shall include but are not limited to: ▪ minimising the amount of exposed erodible surfaces during construction - this may include staging of works; ▪ installation and maintenance of erosion and sedimentation controls, established in accordance with EPA best practice guidelines for the treatment of sediment laden run-off resulting from construction activities; ▪ prompt temporary and/or permanent progressive revegetation of the Site as work proceeds; ▪ installation and maintenance of catch drains to divert and segregate water runoff from catchments outside the construction site from water exposed to the construction site and to adequately control and route runoff within the construction site to the appropriate sedimentation control installation; ▪ treatment of open drains to prevent erosion before adjacent ground is disturbed and excavation is commenced; ▪ prompt covering of exposed surfaces (including batters and stockpiles) that would otherwise remain bare for more than 21: days - cover may include mulch, erosion control mat or seeding with sterile grass; ▪ minimising the timing between clearing and stripping of the Site and covering of erodible surfaces; and ▪ where trees are required to be removed more than two months in advance of any construction works, remove only that part of the tree that is above ground level and where possible allow the roots to remain intact beneath the ground surface to assist with erosion control.
(b)	Work in/near Waters Works shall be programmed and managed so as to avoid work in waters. Where work in waters is unavoidable, procedures shall be developed and implemented to satisfy the requirements of this Clause 1200 and as required by any permits from the responsible authority(s). Where construction activities are undertaken in, near or over waters, Environmental Management Plan(s) shall be prepared to protect beneficial uses in accordance with any permit, the State Environment Protection Policy (Waters of Victoria), its schedules and best practice guidelines.
(c)	Sedimentation Basins Where sedimentation basins are proposed as control measures, basins shall be designed to contain flows from a rainfall event having an Average Recurrence Interval of not less than 2 years and 6 hours duration when allowing for a 30% reduction in capacity as a result of sediment accumulation. Sedimentation basins shall be modelled and sized to manage rainfall intensities and soil characteristics specific to the region shall be used. The sizing and modelling of sedimentation basin(s) shall consider the expected works and associated area of disturbance within catchment areas(s) within the site. The sizing and modelling of temporary sedimentation basins shall be undertaken utilising recognised 'best practice' modelling techniques or by utilising 'VicRoads Temporary Sedimentation Basin Design Tool'. Spillways or bypass systems (installations that divert all clean surface flows around a works site) shall be designed for an event having an Average Recurrence Interval of 5 years. An independent hydraulic consultant who has demonstrated competence and suitable experience in the design of temporary sedimentation basins, shall complete and sign a declaration in accordance with the proforma included in Appendix E2 of this specification. The declaration shall accompany submission of the sedimentation basin designs to the Superintendent.

Section	Description
HP	**The Contractor shall submit to the Superintendent the temporary sedimentation designs and the associated independent verification declarations not less than 2 weeks prior to the commencement of construction of the temporary sedimentation basin.** Sedimentation basins shall be cleaned out whenever the accumulated sediment has reduced the capacity of the basin by 30 percent or more, or whenever the sediment has built up to a point where it is less than 500 mm below the spillway crest, whichever occurs earlier. The Contractor shall maintain the capacity of the sedimentation basin and shall ensure compliance with Clause 1200.04(b)(ii) if dewatering to a waterway.
(d)	Stockpiles Where soil is stockpiled on Site, such stockpiles shall be located, where possible, to provide a clearance of not less than 10 metres from waters. Where it is not possible to provide a clearance of 10 metres, the stockpile shall be above the normal high water level of the waters and additional protection shall be provided to prevent the stockpiled material entering the waters.
(e)	Monitoring The Contractor shall monitor the whole Site for instances of soil erosion or scour and the effectiveness of erosion and sedimentation controls in accordance with the following: ▪ at intervals not more than 7 days; ▪ within one hour of the commencement of any runoff resulting from rain events during working hours; ▪ every 4 hours during periods of continuous rain during working hours; and ▪ within 12 hours of a rain event outside working hours. Any defects and/or deficiencies in control measures identified by monitoring undertaken shall be rectified immediately and these control measures shall be cleaned, repaired and augmented as required to ensure effective control thereafter.
1200.09	**Contaminated soils and materials**
(a)	General All work under the Contract shall comply with the following requirements: ▪ soils or materials shall not be contaminated as a consequence of work under the Contract; ▪ materials imported to the Site shall be free from contamination; ▪ contaminated materials shall only be reused on site through agreement and approval from the Superintendent and EPA; ▪ contaminated materials to be reused onsite as part of the Contract shall be stored and managed to minimise any impact on the Site or surrounding environment; and ▪ the transport and disposal of contaminated soils or materials off-site shall be undertaken in accordance with relevant legislation and State Environment Protection Policies, or by a method agreed with the Environment Protection Authority (EPA).
(b)	Discovery of Contaminated Material The discovery of contaminated material on the site during works shall be managed in accordance with VicRoads and EPA Guidelines. In the event that contaminated material is encountered on the Site, the Contractor shall: (i) notify the Superintendent and where applicable EPA; (ii) undertake comprehensive sampling and analysis to determine the type and levels of contamination in accordance with EPA Soils Sampling Guideline (Off-site management and Acceptance to Landfill) EPA No. 1178 and A Guide to the Sampling and Analysis of Waters, Wastewaters, Soils and Wastes EPA No. 441; (iii) investigate the opportunity to reuse the contaminated soil and/or material as a fill material on-site; and (iv) ensure that any proposed reuse and/or disposal methods are acceptable to the Superintendent and the EPA.
(c)	Use of Contaminated Material The use of contaminated material in the work under the contract shall be subject to the approval of the Superintendent and the EPA. The Contractor shall follow procedures and best practice containment and management techniques in VicRoads Guidelines 'Reclaimed Materials Guidelines for Material Reuse' and relevant EPA documentation when such materials are reused onsite. Prior to the use of any contaminated material on the Site, the material shall be assessed by an independent environmental specialist to verify that the proposed use is in accordance with legislative requirements. Where directed an Environmental Improvement Plan (EIP) or other documentation shall be prepared in liaison with EPA and the Superintendent. Where any contaminated material is used in the works, records shall be kept of the source, type of contamination, volume of contaminated material incorporated, the locations placed and all investigations undertaken. The location of contaminated material incorporated into the site shall be identified in the 'As Constructed' drawings. Copies of all documentation including the EIP are to be forwarded to the Superintendent.
(d)	Putrescible Waste Material Where putrescible waste material is encountered the Superintendent and EPA shall be notified. The nature and extent of the waste material should be identified. Where required by the Superintendent and/or EPA a management plan shall be developed to manage the waste. Work should not progress in the area of the waste until the EPA and the Superintendent have been consulted regarding the nature and extent of the waste and the proposed course of action.
(e)	Monitoring

Section	Description
	The Contractor shall undertake a visual assessment of the Site for contaminated soils and materials at the following intervals: ▪ When stripping: Daily ▪ During excavations: Daily ▪ When importing filling material: Daily
1200.10	**Waste and Resource Use**
	Refer to Section 21.6.
1200.11	**Fuels and Chemicals**
(a)	General There shall be no leakage or spillage of any fuels or chemicals. Environmental Management Plan(s) shall include specific procedures to mitigate the effect on the environment from fuels and chemicals, including herbicides and pesticides. Such procedures shall include but not be limited to: ▪ nominated points for the refuelling and fluid top up of vehicles and plant which shall be undertaken in a designated area at least 20 m from any drainage point or waters; ▪ methods of disposal of any contaminated materials resulting from refuelling; ▪ nominated fuel and chemical storage areas that comply with Dangerous Goods (Storage and Handling) Regulations 2000 and EPA Bunding Guidelines (EPA Publication 347); ▪ provision of readily accessible and maintained hydrocarbon spill kits for the purpose of cleaning up oil and fuel spillages on the Site at all times; ▪ ensuring that personnel trained in the efficient deployment of the spill kits are readily available in the event of spillages; and ▪ a contingency plan that shall address the containment, treatment and disposal of any spill.
(b)	Monitoring Fuel and chemical storages and equipment fill areas shall be monitored for compliance with this clause and any Occupational Health and Safety and storage and handling regulations at intervals of not more than 7 days.

Western Highway, Box's Cutting – looking west

Table 21-11 Soils and geology summary management measures

Risk No	Risk Description	Management Measures	Responsibility
G1	There is a potential that contaminated soils could be encountered during construction of the duplication resulting in exposure of construction works to contaminated soils.	The discovery of contaminated material on the site during construction works would be managed in accordance with VicRoads and EPA Guidelines. Where putrescible waste material is encountered, the Superintendent and EPA would be notified. Construction works along the affected area would stop until a mitigation plan is established and agreed between the relevant project stakeholders. The Contractor would undertake a visual assessment of the Site for contaminated soil and uncontrolled waste during construction works. A Construction Environmental Management Plan (CEMP) developed to provide details on appropriate methods for managing contaminated soils. An in-situ investigation in with EPA Industrial Waste Resource Guideline (IWRG) 702 would be completed along the proposed alignment to establish if contaminated soils are present. If contaminated soils are present, the result of the investigation would assist to provide appropriate soil management advice including disposal recommendations.	VicRoads
G2	An uncontained spill or leak of chemicals occurs during construction of the duplication.	Refer to management details detailed in G1 for soils that are contaminated by an uncontrolled spill or leak. For Fuel and Chemicals stored onsite, the CEMP would include specific procedures to minimise spillage of any fuels or chemicals and mitigate the effect in the event that leakages and spillages occur. Fuel, chemical and equipment storage areas would be visually monitored at intervals of not more than 7 day to mitigate contamination in a timely manner. Additional management measures may be required depending on the CEMP which would include: ▪ Appropriate procedures for containing spills and leaks. ▪ Appropriate methods for cleaning up spills and leaks where safe to do so.	VicRoads
G3	Potentially contaminated runoff reaching sensitive water ways during and after construction	Water Sensitive Road Design measures would be evaluated for inclusion in the detailed design phase, as described in VicRoads Integrated Water Management Guidelines (August 2011) Road construction would include design features to mitigate runoff of spills into waterways.	VicRoads
G4	Excavation encounters unstable geological units or erosion prone areas. Geological units of Cambrian origin may be more prone to erosional processes on exposure.	Geotechnical investigations would be conducted prior to construction to assess nature of soils encountered along the alignment. Implementation of erosion and sediment Control Measures though CEMP, including but not limited to: minimising the amount of exposed erodible surfaces, installation of erosion and sedimentation control, prompt covering of exposed surfaces, progressive revegetation of the site, management of stockpiles and co-ordination to avoid works near watercourses. Detailed design cuts and final batter slopes to appropriately reflect the local geological and geotechnical conditions. Improved surface drainage measures in the management of erosion and sediment control.	VicRoads
G5	Soft or compressible soils are present along the alignment.	Geotechnical investigations would be conducted prior to construction to identify and assess the nature of soft or compressible soils, together with recommendations for construction. Such recommendations may include adopting a staged construction approach (allowing for dissipation of pore pressure and / or temporary surcharge loading) or treatment of existing subgrade soils. Project to implement a staged construction approach in the construction of fill embankments, allowing for dissipation of excess pore water pressures where soft soils are expected or known to exist. Subgrade treatment or improvement may be required in instances to control settlement of fills. Consider the identification of soft or compressible soils by using the proof roll of prepared subgrades to receive fill, together with in-situ density and bearing capacity tests, at an appropriate interval for the section of road being constructed.	VicRoads
G6	Imbalance in the volume of suitable fill and the volume of excavated material.	Earthworks are expected to be dominated by the need for fill above the natural surface to achieve drainage and great flood control or grade separation. Fill material would be sourced from surplus materials from site, and additional sources including local quarries, borrow pits under arrangement between Contractors and local land owners. Road pavement materials would be sourced from appropriately licenced facilities. Surplus material that cannot be used on site would be re-used disposed of in the following order of priority:	VicRoads

Risk No	Risk Description	Management Measures	Responsibility
		1) Transfer to nearby VicRoads projects for immediate use or to an approved VicRoads stockpile site for future use; 2) Transfer to an alternative VicRoads approved site for re-use on concurrent private / local government project; or 3) Disposal at an accredited materials recycling or waste facility. 4) Disposal at an approved borrow pits for fill material Assess likely earthworks volumes during design to optimise solution (balance cut and fill where possible).	
G7	Construction intersects Acid Sulfate Soils, potential disturbance and exposure to air	Soils suspected of being Acid Sulfate Soils are to be sampled and analysed to assess the Acid Sulfate Soil potential. In the event that Acid Sulfate Soils are discovered an Acid Sulfate Soil Management Plan would be prepared.	VicRoads
G8	Construction intersects historic mining works, including deep lead and shallow workings.	Desktop assessment complimented with Geotechnical investigations would be conducted prior to design and construction to identify and assess the nature and extent of the shallow and deep mine workings. Construction may include ground improvement techniques to bridge identified poorly reinstated or susceptible historical mining areas.	VicRoads

21.7.4 Groundwater

Table 21-12 Groundwater objectives and indicators

Objectives	Indicators
▪ Protect beneficial uses of groundwater ▪ Comply with State Environment Protection Policy (Groundwaters of Victoria)	▪ Project activities conducted in accordance with a groundwater management plan and monitoring program

Table 21-13 Extract of VicRoads Contract Shell DC1, Section 1200 Environment Protection

Section	Description
1200.05	**Groundwater**
(a)	General
	The beneficial uses of groundwater shall not be adversely affected.
	An assessment of the potential impact of the work under the Contract shall be undertaken to ascertain the beneficial uses to be protected as provided for in SEPP (Groundwaters of Victoria) and SEPP (Waters of Victoria) when groundwater is: • expected to be encountered during works under the Contract – as part of the development of Environmental Management Plans; • unexpectedly encountered during works under the Contract – immediately after identification of the presence of groundwater. The Contractor shall consider the beneficial uses, quality and quantity of groundwater when determining the ongoing management of groundwater (i.e. reuse, discharge, aquifer recharge). Such consideration shall be completed prior to the completion of related design and prior to commencement / continuation of related construction activities.
	Where groundwater is unexpectedly encountered, a management plan shall be developed and implemented to manage the groundwater and protect beneficial uses in accordance with the requirements of the EPA and/or relevant authority. The contractor shall undertake monitoring in accordance with the requirements of the relevant authority and/or EPA and identified in the management plan.
	Groundwater encountered on-site shall be assessed for the opportunity for reuse as a non-potable water source for the duration of the Contract.
(b)	Monitoring (Ground water monitoring of standpipes is now a "special clause")
	(i) Locations
	Groundwater monitoring shall be undertaken at:
	specify any existing stand pipe/bore locations that should be utilised for ground water monitoring:
	Where stand pipe/bores are disturbed by work under the Contract, replacement monitoring locations shall be provided. Replacement and/or new stand pipes/bores shall be located outside of the limits of ground disturbing activities and where the impact of ground movement is likely to have the greatest effect.
	Details of monitoring locations for groundwater shall be maintained on a site plan.
	(ii) Timing

<table>
<tr><th>Section</th><th>Description</th></tr>
<tr><td></td><td>The timing and frequency of groundwater monitoring shall be in accordance with Table 1200.051.</td></tr>
<tr><td></td><td>Table 1200.051
<table>
<tr><th>Timing and Frequency</th><th>Location</th><th>Parameter</th><th>Issue Specific Requirements</th></tr>
<tr><td>immediately prior to work commencing</td><td>All monitoring locations specified</td><td>Groundwater level & flow
Salinity as total dissolved solids (TDS mg/L)
Electrical conductivity (µS/cm)
other parameters as agreed with VicRoads Environmental Services and/or EPA and/or relevant authority</td><td>as determined from planning/ pre-construction studies</td></tr>
<tr><td>Monthly</td><td>All monitoring locations specified</td><td>As above</td><td>As above</td></tr>
</table></td></tr>
<tr><td>1200.08</td><td>Erosion and Sediment Control Measures</td></tr>
<tr><td></td><td>Refer to Table 21-10</td></tr>
<tr><td>1200.09</td><td>Contaminated Soils and Materials</td></tr>
<tr><td></td><td>Refer to Table 21-10</td></tr>
<tr><td>1200.10</td><td>Waste and Resource Use</td></tr>
<tr><td></td><td>Refer to Section 21.6</td></tr>
<tr><td>1200.11</td><td>Fuels and Chemical Management</td></tr>
<tr><td></td><td>Refer to Table 21-10</td></tr>
</table>

Table 21-14 Groundwater summary management measures

Risk No	Risk Description	Management Measure s	Responsibility
GW1	Cuts below water table along alignment, requiring dewatering (construction and/or operation). Dewatering drawdown impact to other groundwater users (e.g. irrigators, stock and domestic users).	A groundwater management plan and monitoring program would be developed and implemented to address potential impacts to groundwater if encountered. The groundwater management plan would include controls to prevent erosion and sedimentation and include water disposal options. Construction groundwater supplies would have to be from licensed bores and subject to the Southern Rural Water approvals process and/or groundwater trading rules / local management rules. An audit of landholders would be conducted to identify water supplies that may be impacted, e.g. dams or bores. Measures to mitigate groundwater draw down impacts would include: ▪ Minimise dewatering required by micro-review of gradelines. ▪ Preconstruction investigations of groundwater (occurrence and quality), particularly in proposed areas of cut, and establishment of baseline conditions. ▪ Detailed design of cuts and ground support. Alteration of the construction technique to reduce the need for dewatering. A variety of engineering options are available, e.g. use of sheet piles / contiguous piles. ▪ Careful design of the dewatering methodology, e.g. multiple closely spaced bores may create a localized cone of depression. ▪ Increased construction effort, e.g. reducing the duration over which dewatering may be required; ▪ Careful timing of the works to periods where water levels may be at their lowest. ▪ Re-injection of the pumped groundwater between the excavation site and impacted part to impart hydraulic control (aquifer recharge). ▪ Non-continuous pumping that may allow water level recovery during pumping quiescence. ▪ Supplying any affected parties with an alternate water supply, e.g. carting water, deepening the pump intake setting depth. ▪ Replacement of existing bores that are adversely impacted by construction.	VicRoads/ Contractor(s)

Risk No	Risk Description	Management Measure s	Responsibility
		▪ Implementing a groundwater monitoring program. ▪ Sufficient contingency must be incorporated into water treatment plans, monitoring programs (environmental, safety) to cope with the ingress, management, treatment and disposal of contaminated groundwater water that may be unexpectedly encountered.	
GW2	Cuts below water table along alignment, requiring dewatering (construction and/or operation). Groundwater dewatering discharge degrades surface water quality.	Comply with section 1200.08 Erosion and Sediment Control of the VicRoads contract specification. As per GW1.	Contractor(s)
GW3	Cuts below water table along alignment, requiring dewatering (construction and/or operation). Dewatering / depressurisation consolidates compressible materials causing settlement and land instability.	As per GW1. A site specific investigation would be conducted during detailed design to identify likelihood of subsidence.	Contractor(s)
GW4	Cuts below water table along alignment, requiring dewatering (construction and/or operation). Temporary construction dewatering drawdown adversely affects groundwater flow to groundwater dependent ecosystems. Cuts below grade permanently resulting in change in groundwater flow regime.	As per GW1. If required, an alternate water supply would be established to maintain environmental water requirements, e.g. treated stormwater / road drainage could be redirected as a replenishing or alternate water supply.	Contractor(s)
GW5	Cuts below water table along alignment, requiring dewatering (construction and/or operation). Dewatering alters hydraulic gradients resulting in existing contamination plumes potentially being dislocated / moved. Interruption of existing groundwater remediation efforts.	As per GW1. Contaminated materials would be managed as follows: ▪ The discovery of contaminated material on the site during works would be managed in accordance with VicRoads and EPA Guidelines. ▪ Where putrescible waste material is encountered the Superintendent and EPA would be notified. ▪ The Contractor would undertake a visual assessment of the Site for contaminated soils and materials.	Contractor(s)
GW6	Cuts below water table along alignment, requiring dewatering (construction and/or operation). Potential generation of acid plumes / mobilisation of heavy metals / aggressive groundwater, leading to attack on submerged steel / concrete structures (piles, services).	As per GW1. Development of an Environmental Management Plan (EMP) to establish a consistent and sustainable approach to managing PASS e.g. DSE Victorian Best Practice Guidelines for Assessing and Managing Coastal Acid Sulphate Soils Minimise the dewatering influence near PASS materials (as per GW1). Soil sampling and laboratory analysis would be conducted as part of the detailed design phase to confirm the presence of ASS. Groundwater levels and quality would be monitored in all aquifers adjoining PASS materials. Performance standards and action triggers would be established for: ▪ implementing remedial actions. Impacted or at risk areas/assets remediation can be undertaken through pH adjustment, e.g. lime dosing. ▪ - considering the need for artificial recharge.	Contractor(s)
GW7	Contamination of groundwater from construction activities (e.g. spillage, use of 'contaminated ' fill material, construction waste management, hazardous materials handling). Impact to groundwater quality/ breach	Contaminated materials would be managed as follows: ▪ The discovery of contaminated material on the site during works would be managed in accordance with VicRoads and EPA Guidelines. ▪ Where putrescible waste material is encountered the Superintendent and EPA would be notified. ▪ The Contractor would undertake a visual assessment of the Site for contaminated soils and materials.	Contractor(s)

Risk No	Risk Description	Management Measure s	Responsibility
	of SEPP (Groundwater of Victoria). Impact to worker safety.	The EMP could include specific procedures to minimise leakage or spillage of any fuels or chemicals. Fuel and chemical storages and equipment fill areas would be monitored at internals or not more than seven days.	
GW8	Contamination of groundwater from operational activities (road runoff, traffic accidents, stormwater, spillage)	Standard procedures for State Emergency Response, Country Fire Authority and Environment Protection Authority would be implemented.	Contractor(s)
GW9	Ponding and retention of water associated with highway drainage (operation). New or increased groundwater accessions, altered groundwater flow patterns, new or exacerbated waterlogging and salinity impacts.	Water Sensitive Road Design measures would be evaluated in the detailed design phase, as described in VicRoads Integrated Water Management Guidelines (August 2011).	Contractor(s)
GW10	Construction earthworks removing impervious layers (across site, floodplains, river crossings and embankments). Site recharge enhanced increasing groundwater levels (water logging, groundwater displacement) and or introducing contaminants.	A groundwater management plan and monitoring program would be developed and implemented to address potential impacts to groundwater, if encountered. River crossings would be duplicated consistent with CMA requirements. Earthwork surface finish specifications would be specified to mitigate enhanced accessions. Site would be rehabilitated with vegetation / grasses. Grading would be conducted for erosion control. Allowance would be made for subsidence with backfilled excavations. Temporary access tracks would be removed and ground conditions rehabilitated.	Contractor(s)
GW11	Construction works create impervious ground surface layers. Reduced recharge to groundwater system.	As per GW1 and GW10	Contractor(s)
GW12	Project pipelines or conduits constructed in saturated materials alter groundwater flow. Preferential groundwater seepage paths created by buried services within the alignment located below the water table and alter seepage migration routes.	As per GW1. Apply pipeline construction measures (trench cut offs- or breakers) that mitigate risk process, if groundwater is encountered.	Contractor(s)
GW13	Alignment of road passes through existing groundwater bore location [on farm dam] or severs access for stock or irrigation infrastructure. Requirement to compensate groundwater user, install replacement bore (observation, stock, irrigation etc.). Temporary loss of production.	Negotiation with asset owners would be undertaken. Confirm of bore locations (and operational status) within construction corridor and conduct landholder consultation. Construction groundwater supplies would be from licensed bores and subject to the Southern Rural Water approvals process and/or groundwater trading rules / local management rules. Audit of landholders would be conducted of identified water supplies that may be impacted, e.g. dams or bores.	VicRoads/ Contractor(s)
GW14	Use of groundwater for construction water supply causes adverse impact to existing groundwater users, environment.	Construction groundwater supplies would be from licensed bores and subject to the Southern Rural Water approvals process and/or groundwater trading rules / local management rules.	Contractor(s)
GW15	Shallow groundwater or rising water tables causes rising water and/or precipitation of salts can damage road pavements.	Adequate road (under) drainage. Understanding of conditions of existing road i.e. correlations from existing behaviour.	VicRoads/ Contractor(s)

21.7.5 Surface Water

Table 21-15 Surface water objectives and indicators

Objectives	Indicators
▪ Comply with the State Environment Protection Policy (Waters of Victoria) ▪ Protect river health and waterway quality ▪ Minimise impacts on waterways and floodplain hydraulics	▪ No deterioration in water quality between the upstream and downstream limits of the work site during the construction period (where upstream results become background limits) ▪ All waterway crossings provide for fauna passage ▪ Drainage systems cater for the design storm event (1 in 100 year ARI)

Table 21-16 Extract of VicRoads Contract Shell DC1, Section 1200 Environment Protection

Section	Description
1200.04	**Water Quality Monitoring**
(b)	Waters shall be monitored for the parameters identified in Table 1200.041 during all stages of construction to ensure that the water quality in the receiving waters: ▪ does not deteriorate between the upstream and downstream limits of the work site during the construction period (where upstream results become the background limits); or ▪ is as agreed between the Contractor, the Superintendent and EPA. The Contractor shall provide and maintain equipment capable of providing instantaneous monitoring of parameters as required in Table 1200.041 and have such equipment available on-site at all times. All equipment associated with monitoring shall be maintained and calibrated in accordance with the manufacturer's or equipment supplier's requirements. **Table 1200.041 Construction Monitoring** **Parameter** / **Method** Turbidity (Turb) – NTU / Measure with on-site meter Electrical Conductivity (EC) – µS/cm / Measure with on-site meter pH / Measure with on-site meter Dissolved oxygen (DO) – mg/L / Measure with on-site meter Temperature (°C) / Measure with on-site meter Suspended Solids (SS) – mg/L / Measure with on-site meter Litter (definition, including solid inert waste) / Visual (prevent litter from entering waters and drainage systems) Oils and Greases / Visual (No visible free oil or greases)

Table 21-17 Surface water summary management measures

Risk No	Risk Description	Management Measures	Responsibility
SW1	Construction activities could result in disturbance to channel planform, geometry and river health values.	Waterways upstream and downstream of the road would be protected from scour. Appropriate measures would be in place to prevent scour for flows of not less than the design drainage flow. Waterways would be realigned where required to maintain hydraulic capacity and allow appropriate reinstatement of waterway values. Construction of bridge spans longer than required for flow conveyance in order to bridge areas of high river health value.	Designer
SW2	Construction of the Western Highway results in the change in hydraulic conditions and geomorphological response at crossing locations.	There is no requirement for additional management measures beyond the standard controls (i.e. appropriately sized waterway openings and downstream bed and ban protection works)	Designer

Risk No	Risk Description	Management Measures	Responsibility
SW3	Restrictions to aquatic and terrestrial fauna movement, impediments to future waterway and catchment rehabilitation efforts.	Where a waterway has the potential to offer passage of aquatic fauna the road crossing would be designed in a manner that would not discourage fauna passage.	Designer
SW4	Degradation of water quality in receiving waterway and impact on aquatic ecosystem as a result of increased sediment and contaminant loadings during construction of the road.	Water quality upstream and downstream of works would be monitored. Soil conservation measures would be employed on site to minimise the amount of sediment mobilised. Works would be scheduled to avoid working in flowing waterways where possible. Sediment basins would be designed to 'best practice' standard and sized specifically for each site. Water quality treatment measures would collect and treat runoff from all pavement areas to the required levels prior to discharging into surrounding drainage networks and / or waterways.	Construction Contractor(s)
SW5	Degradation of water quality in receiving waterway and impact on aquatic ecosystem as a result of increased sediment and contaminant loadings during the operation of the road.	Stormwater runoff from the road pavement would meet the water quality performance criteria requirements of the SEPP (WoV). Best practice pollution reduction targets achieved. During operation VicRoads would comply with Water Sensitive Road Design practices, including regular maintenance of design features intended to capture and treat stormwater run-off from the road.	Designer / VicRoads
SW6	Increased afflux and extent of upstream flooding and/or redistribution of flows results in an increase in flooding.	Drainage systems would cater for the design storm event (1 in 100 year ARI) and would have sufficient capacity to accommodate the design drainage flow. Compensation works for loss of flood plain storage where required due to a risk of increasing flood levels.	Designer

Western Highway, Hopkins River Bridge

21.7.6 Biodiversity and Habitat

Table 21-18 Biodiversity and habitat objectives and indicators

Objectives	Indicators
▪ Minimise loss of native vegetation ▪ Avoid and minimise impacts on significant flora, fauna and ecological communities. ▪ Prevent introduction and spread of pest plants, weeds and disease	▪ No-go zones established to protect native vegetation that is to be retained ▪ Project activities conducted in accordance with specific measures and species management plans for EPBC and FFG listed threatened species and communities ▪ Development and implementation of a native vegetation Offset Management Strategy ▪ Development and implementation of a weed management and control program ▪ Development and implementation of hygiene practices to alleviate pathogen/disease risk.

Table 21-19 Extract of VicRoads Contract Shell DC1, Section 1200 Environment Protection

<table>
<tr><th>Section</th><th>Description</th></tr>
<tr><td>1200.13</td><td>Flora and Fauna</td></tr>
<tr><td>(a)</td><td>General</td></tr>
<tr><td></td><td>All work under the Contract shall comply with the following requirements:
▪ avoid, minimise and offset (where appropriate) the removal of native vegetation during construction;
▪ avoid injury to fauna or damage to protected vegetation or habitat; and
▪ the discovery of significant flora and fauna sites, species or habitat not previously identified shall be managed to protect flora and fauna and will be recorded, with records supplied to the Department of Sustainability and Environment.</td></tr>
<tr><td>(b)</td><td>Permits and Approvals</td></tr>
<tr><td></td><td>The permits and/or approvals identified in Table 1200.131 have already been obtained, or are being obtained by VicRoads. Works under the Contract shall comply with all permits and approvals and associated conditions.</td></tr>
<tr><td></td><td>Table 1200.131 – Flora and Fauna Permits Obtained by VicRoads
<table>
<tr><td>Site / Species</td><td>Permit / Approval Number</td><td>Issuing Authority</td></tr>
<tr><td colspan="3">Flora</td></tr>
<tr><td>:</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">Fauna</td></tr>
<tr><td>:</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td></td><td>Permits from relevant authorities must be obtained prior to disturbance of flora/fauna sites or relocation of native fauna affected by works under the Contract.</td></tr>
<tr><td>(c)</td><td>Protection of Flora and Fauna Sites</td></tr>
<tr><td></td><td>Works shall not damage, disturb or otherwise adversely impact:
▪ vegetation/habitat sites and areas of significance listed in Table 1200.132;
▪ any other significant vegetation/habitat sites, not listed in Table 1200.132, that are not required to be removed for permanent works;
▪ any significant native flora/fauna sites or habitat discovered during works under the Contract without prior approval from the Superintendent and obtaining all relevant permits; and
▪ any native vegetation on or off-site that has not clearly been marked and identified for removal.</td></tr>
</table>

<table>
<tr><th>Section</th><th>Description</th></tr>
<tr><td></td><td>Table 1200.132
<table>
<tr><td>Vegetation/Habitat Site</td><td>Chainage/AMG grid reference/location</td></tr>
<tr><td>[insert site detail,
e.g. State significant species]:</td><td>E [insert grid reference e.g. 321900]:
N [insert grid reference e.g. 5828525]:
or refer to Volume 2 – Drawings or flora/fauna reports as required:</td></tr>
<tr><td></td><td></td></tr>
</table></td></tr>
<tr><td></td><td>All personnel working on site shall be made aware of their responsibility to not enter any areas clearly marked as 'No Go Zones', and only conduct works within the defined work corridor.</td></tr>
<tr><td></td><td>All sites nominated in Table 1200.132 and any additional existing vegetation and native fauna habitat identified to be retained, shall be identified as 'No Go Zones' and protected by temporary fencing and signage. All fencing of 'No Go Zones' shall as a minimum be:
▪ erected a minimum of 1 metre beyond the boundary of the habitat to be protected, or the drip line of the trees, or as agreed by the Superintendent;
▪ constructed of star picket, paraweb one wire support;
▪ communicated by signage installed on the temporary fencing at intervals no less than 20 metres apart stating 'Protected Area – No Unauthorised Access'; and
▪ retained in place for the duration of the construction period (until Practical Completion).</td></tr>
<tr><td>HP</td><td>Prior to removing any vegetation or habitat, the Contractor shall:
▪ arrange an on-site inspection with the Superintendent, other relevant authorities and an ecological consultant to confirm and clearly identify and mark trees, vegetation or habitat to be removed, consistent with the Contract drawings and any relevant permits; and
▪ fence and sign all sites nominated as No Go Zones.</td></tr>
<tr><td></td><td>Plant, equipment, material or debris shall not be placed or stored within the limit of the root zone of vegetation to be retained.</td></tr>
<tr><td>(d)</td><td>Removal of Flora and Protection of Fauna</td></tr>
<tr><td></td><td>A suitably qualified ecologist with the appropriate permits/licences shall be present on Site during the removal of vegetation to:
▪ identify and examine any trees (including hollow bearing trees) and/or fallen logs affected by works under the Contract to identify, capture and relocate fauna identified within the zone to be cleared; and
▪ provide advice on alternative fauna habitat sites.</td></tr>
<tr><td></td><td>If appropriate, relocation of any fauna or nests shall be made to adjacent habitat and shall be undertaken in accordance with the requirements of the Department of Sustainability and Environment. Where practicable, any nests found to be inhabited by native birds or by mammals (e.g. possums or gliders) shall be removed outside of the species' breeding season.</td></tr>
<tr><td>(e)</td><td>Discovery of Significant Flora or Fauna</td></tr>
<tr><td></td><td>In the event that significant flora or fauna is discovered, the Contractor shall immediately cease operation and notify the Superintendent.</td></tr>
<tr><td></td><td>An appropriately qualified ecologist shall be engaged to accurately identify and provide advice for the management of the discovered significant flora or fauna species.</td></tr>
<tr><td></td><td>The Contractor shall submit to the Superintendent a procedure/management plan that has been approved by the relevant authority to manage the flora or fauna species</td></tr>
<tr><td>(f)</td><td>Damage to Protected Vegetation</td></tr>
<tr><td></td><td>Where damage to flora or fauna habitat has occurred as the result of work under the Contract, the Superintendent will direct the Contractor to repair or offset the vegetation and/or provide fauna habitat to an equivalent or better quality in accordance with the document 'Victoria's Native Vegetation: A Framework for Action' and 'Native Vegetation Revegetation Planning Standards June 2006'.</td></tr>
<tr><td></td><td>The removal or damage of protected vegetation and/or habitat listed in Table 1200.132 as a result of the works under the Contract will cause a deduction to be applied and deducted in accordance with Section 4010.</td></tr>
<tr><td>(g)</td><td>Monitoring</td></tr>
<tr><td></td><td>The Contractor shall undertake monitoring of the condition of flora and fauna habitat sites and protective measures at the sites at the following intervals:
When construction activities are occurring in the vicinity of the sites: Daily
At other times: At least every 7 days</td></tr>
<tr><td>(h)</td><td>Insert requirements for additional flora/fauna investigations to be undertaken by the Contractor, or other specific flora/fauna requirements not included in references in Table 1200.031. Delete box if not required:</td></tr>
</table>

Section	Description
1200.14	**Weeds, Pests and Disease**
(a)	General
	Declared weeds, pests and diseases (also referred to as pathogens) shall not be introduced to the Site, spread through the Site, or removed from the Site (if present) as a consequence of work under the Contract.
	The Contractor shall prevent the spread of declared weeds, pests and diseases within the Site and off-site through the implementation of controls that as a minimum shall include: ▪ treatment of declared weeds prior to the commencement of any ground disturbing activities and in response to their identification through monitoring of the site; ▪ management of weed and soil pathogen potential within imported materials; ▪ provision for cleaning plant and equipment prior to: - arrival on Site - departure from Site - movement within the Site from infested to non-infested areas; ▪ location of cleaning areas; ▪ use of a vehicle and machinery hygiene log book.
(b)	Cinnamon Fungus (This clause only applies to projects that are to be undertaken in high risk infected zone/area, as such does not apply.)
(c)	Phylloxera (This clause only applies to projects that are to be undertaken in Phylloxera Infected Zones (PIZ) as identified by the Phylloxera and Grape Industry Board of South Australia website mapping, as such does not apply.)
(d)	Monitoring
	The Site shall be monitored for the presence of weeds and pests at pre-defined intervals.
1200.04	**Water**
	Refer to Table 21-16
1200.07	**Air Quality**
	Refer to Table 21-28
1200.08	**Erosion and Sediment Control**
	Refer to Table 21-10

Table 21-20 Biodiversity and habitat summary management measures

Risk No	Risk Description	Management Measures	Responsibility
FF1	Potential removal of individuals of a known population of the EPBC listed flora Spiny Rice-flower which are present at one location: • Between Warrayatkin Rd and Green Hill Lake Rd	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Further targeted survey to be completed on final alignment prior to construction to identify all existing individuals. Potential for detailed design or construction planning to avoid impact at known locations (e.g. micro alignment change to construction corridor). Prepare and implement a Conservation Management Plan, including a Salvage and Translocation Plan. Collect seed and implement salvage and translocation for any individuals to be removed. Translocation to be undertaken in accordance with a formal translocation plan approved by the Department of Sustainability, Environment, Water, Populations and Communities (SEWPac), which would include post-translocation monitoring. To protect populations during construction, protective fencing would be supplemented with a high-visibility component to indicate the sensitivity of the area.	VicRoads/ Contractor(s)
FF2	Potential removal of individuals of a known population of the DSE advisory listed flora Golden Cowslip which are present within Options 1 and 2.	As per Risk FF1. Translocation to be in accordance with a formal translocation plan approved by DSE, which would include post-translocation monitoring.	VicRoads/ Contractor(s)
FF3a	Approved removal of individuals of a known population of the DSE advisory listed flora Emerald-lip Greenhood which are present within Option 1 and 2.	As per Risk FF1. Translocation to be in accordance with a formal translocation plan approved by DSE, which would include post-translocation monitoring.	VicRoads/ Contractor(s)

Risk No	Risk Description	Management Measures	Responsibility
FF3b	Approved removal of individuals of a known population of the DSE advisory listed flora Yarra Gum which are present within Option 2.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Further targeted survey to be completed on final alignment prior to construction to identify all existing individuals. Potential for detailed design or construction planning to avoid impact at known locations (e.g. micro alignment change to construction corridor). Prepare and implement a Conservation Management Plan including collecting seed and implementing salvage program. To protect populations during construction, protective fencing would be supplemented with a high-visibility component to indicate the sensitivity of the area.	VicRoads/ Contractor(s)
FF4	Construction encounters unexpected listed flora species (species not known to be present from targeted survey).	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Avoid impacts if possible, by altering the construction area. Otherwise where applicable, implement a translocation plan for these individuals.	VicRoads/ Contractor(s)
FF5	Construction encounters EPBC Act listed Dwarf Galaxias from known habitats (Billy Billy Creek).	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Implement a Construction EMP detailing erosion and sediment controls. Development of a Conservation Management Plan for Dwarf Galaxias prior to project approval. Construction around and in watercourse to occur outside breeding period/dispersal period (May to October). Monitor weather for rainfall events within the catchment and postpone work near Billy Billy Creek during expected elevated flows. Bridge to span waterway, no structures to be installed in low-flow channel. Bridge structures to be at least 5m from the regular flow bank to allow for fauna movement under the bridge. All waterway crossings within known and potential habitats to be designed to allow for unimpeded Dwarf Galaxias dispersal under flood conditions. Conduct pre-clearance fauna surveys and then attempt relocation where possible.	VicRoads/ Contractor(s)
FF6	Construction encounters EPBC Act listed Golden Sun Moth (GSM) (Pope Road).	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Potential for detailed design or construction planning to avoid impact at known locations/habitats (e.g. micro alignment change to construction corridor). Revegetate Right of Way (ROW) with grassland species favoured as a food source by GSM (e.g. *Austrodanthonia sp.)* where GSM populations are known to be present.	VicRoads/ Contractor(s)
FF7 and FF8	Construction encounters FFG Act listed and DSE Advisory listed Brown Toadlet and Brown Treecreeper	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Conduct further targeted surveys for Brown Toadlet within final alignment. Potential for detailed design or construction planning to avoid impact at known locations/habitats (e.g. micro alignment change to construction corridor). Prepare and implement a Conservation Management Plan (CMP), including a salvage and translocation plan. Where potential habitat for listed fauna species is identified to be removed a qualified ecologist would need to conduct a pre-clearance survey and attempt relocation where necessary/possible. To protect populations during construction, protective fencing would be supplemented with a high-visibility component to indicate the sensitivity of the area.	VicRoads/ Contractor(s)
FF9	Construction encounters FFG listed Victorian Temperate Woodland Bird Community - located along entire alignment	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Potential for detailed design or construction planning to avoid impact at known locations/habitats (e.g. micro alignment change to construction corridor). Prepare and implement a Conservation Management Plan	VicRoads/ Contractor(s)

Risk No	Risk Description	Management Measures	Responsibility
		(CMP), including a salvage and translocation plan. Where potential habitat for listed fauna species is identified to be removed a qualified ecologist would need to conduct a pre-clearance survey and attempt relocation where necessary/possible.	
FF10	The duplication removes or disrupts wildlife corridors or fauna habitat - located along entire alignment	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Potential for detailed design or construction planning to avoid impact at known locations/habitats (e.g. micro alignment change to construction corridor). Install warning signs for potential fauna crossings. Investigate appropriate design response and implement recommendations, for example: ▪ Installation of fauna sensitive road design features at wildlife corridors. ▪ Implement before/after comparison study for fauna road mortality to investigate a) the impact of the road; b) the efficacy of crossing structures. ▪ Use the results of the above study to determine whether additional crossing structures should be installed.	VicRoads/ Contractor(s)
FF11	Construction encounters unexpected listed fauna species (species not known to be present from targeted survey).	As per Risk FF4. Prepare and implement a Conservation Management Plan (CMP), including a salvage and translocation plan. Where potential habitat for listed fauna species is identified to be removed a qualified ecologist would need to conduct a pre-clearance survey and attempt relocation where necessary/possible.	VicRoads/ Contractor(s)
FF12	Increased road kill and injury rates to arboreal native fauna from traffic on additional / new carriageway, particularly where the carriageway passes through wooded areas away from the existing road.	Potential for detailed design or construction planning to avoid impact at known locations/habitats (e.g. micro alignment change to construction corridor). Prepare and implement a salvage and translocation plan. Where potential habitat for listed fauna species is identified to be removed a qualified ecologist would need to conduct a pre-clearance survey and attempt relocation where necessary/possible. Investigate appropriate design response and implement recommendations, for example: ▪ Installation of fauna sensitive road design features at wildlife corridors. ▪ Implement before/after comparison study for fauna road mortality to investigate a) the impact of the road; b) the efficacy of crossing structures. ▪ Use the results of the above study to determine whether additional crossing structures should be installed.	VicRoads/ Contractor(s)
FF13	Construction encounters Ecological Vegetation Communities (EVCs) (Native vegetation and fauna habitat) - located along entire alignment.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Potential for detailed design or construction planning to avoid impact at known locations/habitats (e.g. micro alignment change to construction corridor). Revegetation or landscape plantings to include species appropriate to the local EVC. Where possible retain appropriate habitat features/structure within the construction alignment. Shrubs and other understorey species would be retained or re-established (to the allowable height limit) post-construction. Logs and any felled trees would be left in the area to provide additional fauna habitat. Trees would be trimmed rather than removed where possible. All contractors would be aware of areas of ecological value through a site induction by a qualified botanist (see figures attached for locations of remnant native vegetation) to minimise the likelihood for damage to areas scheduled to be retained and include EVC polygons (areas of sensitivity) on detailed surveying drawings and check for accuracy. The study area would be rehabilitated and revegetated in accordance with Section 9 of Technical Appendix H.	VicRoads/ Contractor(s)

Risk No	Risk Description	Management Measures	Responsibility
FF14a	Construction encounters the EPBC listed community, Grassy Eucalypt Woodland of the Victorian Volcanic plain, located along entire alignment.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Detailed design and construction planning to minimise native vegetation loss as far as possible.	VicRoads/ Contractor(s)
FF14b	Construction encounters the EPBC listed community, Natural Temperate Grassland of the Victorian Volcanic Plain.	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Detailed design and construction planning to minimise native vegetation loss as far as possible.	VicRoads/ Contractor(s)
FF15	Construction encounters the following FFG listed community - Western (Basalt) Plains Grasslands - located along entire alignment	As per Risk FF14.	VicRoads/ Contractor(s)
FF16	Construction encounters Large and Very Large Scattered Trees/Hollow-bearing trees/fauna habitat - located along entire alignment	Comply with section 1200.13 Flora and Fauna of the VicRoads contract specification. Detailed design and construction planning to minimise loss of trees, particularly Medium Old Trees, Large Old Trees and Very Large Old Trees and those which are hollow bearing, with the advice of an arborist.	VicRoads/ Contractor(s)
FF17	Construction of waterway crossings at Billy Billy Creek and Hopkins River.	Implementation of a Construction EMP detailing: ▪ Erosion and sediment control measures. ▪ Fuel and chemical management procedures. No structures within the stream, and consistent with CMA requirements. Fish sensitive design of structures to provide safe fish passage. Schedule construction to no-flow or low-flow periods. Establish a water quality monitoring regime to assess and limit any construction impacts. This would include a before/after sampling design, including several upstream and downstream sites. Establish a set of site specific criteria that would trigger intervention of works in the event of a noticeable deterioration in habitat, water quality or observed direct death or injury of aquatic fauna (particularly Dwarf Galaxias in Billy Billy Creek). Establish appropriate response actions in case of such an event based on these site specific criteria. Sedimentation and pollution control measures are to be implemented at all times, in accordance with EPA guidelines, to prevent impacts to waterways and wetlands. All waterways disturbed during project construction are to be revegetated and restored (to a condition equal to or better than pre-construction) after completion of construction. Any snags and/or logs that are removed from any waterways to be replaced in similar locations after completion of construction (particularly Billy Billy Creek as these features provide habitat for Dwarf Galaxias). The storage of fuel and chemicals (including the refuelling of vehicles and machinery) at a minimum of 50 metres away from all waterways; Site toilets to be a minimum of 50 metres away from all waterways; and, Schedule construction to no-flow or low-flow periods.	VicRoads/ Contractor(s)
FF18	Placement of bridge structures within a minor waterway (e.g.culverts).	Implementation of a Construction EMP detailing: ▪ Erosion and sediment control measures. ▪ Fuel and chemical management procedures. Implement fish sensitive design of structures to provide for safe fish passage. Schedule construction to no-flow or low-flow periods.	VicRoads/ Contractor(s)
FF19	Realignment of Charliecombe Creek	Undertake creek realignment during the dry season (summer-autumn) to reduce the likelihood of large water flows through the waterway when the soils are most unstable. Line creek banks with rock material or Geofab to increase bank stability and reduce erosion. Revegetate creek banks as soon as possible after realignment to increase bank stability (using plant species consistent with	VicRoads/ Contractor(s)

Risk No	Risk Description	Management Measures	Responsibility
		the local creekline EVC) Replace any in-stream habitats (e.g. rocks, branches, other snags, etc.). Charliecombe Creek is an ephemeral waterway, however sitting water pools are likely to provide habitat to locally common aquatic fauna species. An assessment of the water table should be completed to ensure that sitting pools are retained. Pool, riffle, run morphological features should be retained to their current lengths and depths. Pre, during and post ecological monitoring (including water quality and macroinvertebrates) should be implemented. Soil testing should be conducted to ensure the soil type is appropriate for the new creek alignment.	
FF20	Construction activities occur outside of agreed construction zone.	Existing vegetation and native fauna habitat identified in the Contract to be retained, would be identified as 'No Go Zones' and protected by temporary fencing and signage erected outside the limit of the canopy of the vegetation or the habitat site. In areas of known, or possible, habitat for listed threatened flora and fauna species, protective fencing should be supplemented with a high-visibility component to indicate the sensitivity of the area. Plant, equipment, material or debris not to be placed or stored within the limit of the root zone of vegetation to be retained.	VicRoads/ Contractor(s)
FF21	Weeds and/or pathogens introduced or spread through construction activities.	The Contractor would develop a procedure to prevent the spread of declared weeds, pests and diseases within the Site and off-site. A weed management and control program would be prepared prior to construction and would be implemented for a period of no less than two years after the completion of the project. Weed management procedures are detailed in Section 9 of Technical Appendix H Pre-construction mapping of weeds and soil pathogens, as other soil pathogens (in addition to cinnamon fungus) may exist in the area. Pathogen management procedures as outlined in Section 9 of Technical Appendix H would be developed to prevent pathogen spread.	VicRoads/ Contractor(s)
FF22	Sediment discharge to waterways resulting from soil erosion or spoil earthworks	Implementation of a Construction EMP detailing erosion and sediment control measures. Installation of sediment fencing adjacent to waterways. Routine maintenance of sediment fences, particularly after large rain events. Maintain as much of the natural vegetation filter strip as possible.	VicRoads/ Contractor(s)
FF23	Construction modifies hydrological/surface water flows	Implementation of a Construction EMP detailing: ▪ Erosion and sediment control measures. ▪ Fuel and chemical management procedures. Installation of appropriate drainage systems. Schedule construction to no-flow or low-flow periods.	VicRoads/ Contractor(s)
FF24	Noise or vibration disturbance to native fauna during construction (daytime) and operation (traffic).	Traffic noise levels would not exceed the objectives specified in VicRoads Traffic Noise Reduction Policy for new and improved roads within and outside of the limit of works.	VicRoads/ Contractor(s)
FF25	Light disturbance to native fauna (e.g., artificial light sources from street construction lights).	Risk is low and therefore there are no mitigation measures recommended to manage the risk.	NA
FF26	Construction creates dust impacting on native fauna, native flora and surface water ecosystems	Implementation of a Construction EMP detailing air quality control measures and strict monitoring procedures Implement methods and management systems consistent with EPA Best Practice Environmental Management: 'Environmental Guidelines for Major Construction Sites' (EPA, 1996). Minimise land disturbance by using phased approach, rehabilitate cleared areas promptly.	Contractor(s)

Risk No	Risk Description	Management Measures	Responsibility
		Keep vehicles to well-defined haul roads, limit vehicle speed and seal haul roads and other exposed areas by means of concrete or paving where necessary. Employ dust suppression methods such as watering down the ROW	
FF27	Creation of pollutants (including smoke, dust, petrochemicals, litter etc.) during construction and operation.	As per Risk FF24. Implementation of a Construction EMP detailing: ▪ Erosion and sediment control measures. ▪ Fuel and chemical management procedures.	Contractor(s)

Hopkins River, south of the Western Highway

21.7.7 Aboriginal Cultural Heritage

Table 21-21 Aboriginal cultural heritage objectives and indicators

Objectives	Indicators
▪ Minimise impacts on Aboriginal cultural heritage ▪ Comply with the *Aboriginal Heritage Act 2006*	▪ Project activities conducted in accordance with approved Cultural Heritage Management Plan

Table 21-22 Extract of VicRoads Contract Shell DC1, Section 1200 Environment Protection (relating to aboriginal cultural heritage only)

Section	Description
1200.15	**Cultural Heritage**
(a)	General
	Cultural heritage sites and areas of cultural significance shall not be damaged, disturbed or otherwise adversely impacted unless an appropriate authorisation has been obtained.
	The Contractor shall undertake all works under the Contract in accordance with the requirements set out in the Cultural Heritage Management Plan (CHMP) (insert name of the CHMP):. The requirements set out in Clause 1200.15(d), (e) and (f) of this Specification are not applicable for the management of Aboriginal Cultural Heritage.
(b)	Statutory Approvals
	The statutory approvals identified in Table 1200.151 have already been obtained, or are being obtained by

<table>
<tr><th>Section</th><th>Description</th></tr>
<tr><td></td><td>VicRoads. The Contractor shall comply with the terms and conditions of these statutory approvals.</td></tr>
<tr><td></td><td>Table 1200.151 – Statutory Approvals Obtained by the Principal
(including Cultural Heritage Management Plans)
<table>
<tr><td>Site</td><td>Statutory Approvals Number</td><td>Issuing Authority</td></tr>
<tr><td colspan="3">Aboriginal Cultural Heritage</td></tr>
<tr><td>:</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">Non-Aboriginal Cultural Heritage</td></tr>
<tr><td>:</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>(c)</td><td>Cultural Heritage Sites</td></tr>
<tr><td></td><td>Table 1200.152 lists known Cultural Heritage sites.</td></tr>
<tr><td></td><td>Table 1200.152
<table>
<tr><td>Site</td><td>Reference number</td><td>Chainage/AMG grid reference/location</td></tr>
<tr><td colspan="3">Aboriginal Cultural Heritage</td></tr>
<tr><td>e.g. Isolated artefact scatter:</td><td>e.g. AAV 7822 / 935:</td><td>e.g. E:321900, N:5828525:</td></tr>
<tr><td colspan="3">Non-Aboriginal Cultural Heritage</td></tr>
<tr><td>e.g. Dry-stone wall, stone shed foundations, corrugated iron:</td><td>e.g. H7822 / 0271:</td><td>e.g. E: 322650, N:5831175:</td></tr>
</table></td></tr>
</table>

Table 21-23 Aboriginal cultural heritage summary management measures

Risk No	Risk Description	Management Measure s	Responsibility
ACH1	Construction encounters the following previously identified Aboriginal cultural heritage place: Western Highway Eurambeen 2 IA	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage place.	VicRoads
ACH2	Construction encounters the following previously identified Aboriginal cultural heritage places: ▪ Eurambeen-Streatham Road Eurambeen 5 IA ▪ Eurambeen-Streatham Road Eurambeen 7 IA	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage places.	VicRoads
ACH3	Construction encounters the following previously identified Aboriginal cultural heritage places: ▪ Eurambeen-Streatham Road Eurambeen 6 IA ▪ Eurambeen-Streatham Road Eurambeen 4 IA	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage places.	VicRoads
ACH4	Construction encounters the following previously identified Aboriginal cultural heritage place: ▪ Eurambeen-Streatham Road Eurambeen 8 IA	Following registration with VAHR, confirm precise place extent in relation to proposed construction.	VicRoads

Risk No	Risk Description	Management Measure s	Responsibility
ACH5	Construction adjacent to the following previously identified Aboriginal cultural heritage place: ▪ Eurambeen-Streatham Road Eurambeen 9 IA	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage place.	VicRoads
ACH6	Construction encounters the following previously identified Aboriginal cultural heritage places: ▪ Eurambeen-Streatham Road Eurambeen I ▪ Eurambeen-Streatham Road Eurambeen 2 IA	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage places.	VicRoads
ACH7	Construction adjacent to (within 40m) the following previously identified Aboriginal cultural heritage place: ▪ Fiery Creek Eurambeen 6 IA	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage places.	VicRoads
ACH8	Construction adjacent to (within 40m) the following previously identified Aboriginal cultural heritage place: ▪ Fiery Creek Eurambeen 5 IA	Following registration with VAHR, confirm precise place extent in relation to proposed construction.	VicRoads
ACH9	Construction immediately adjacent to (within 5m) the following previously identified Aboriginal cultural heritage place: ▪ Fiery Creek Eurambeen 4	Following registration with VAHR, confirm precise place extent in relation to proposed construction.	VicRoads
ACH10	Construction immediately adjacent to (within 5m) the following previously identified Aboriginal cultural heritage place: ▪ Fiery Creek Eurambeen 2 IA	Following registration with VAHR, confirm precise place extent in relation to proposed construction.	VicRoads
ACH11	Construction adjacent to (within 20m) the following previously identified Aboriginal cultural heritage place: ▪ Fiery Creek Eurambeen 1 IA	Following registration with VAHR, confirm precise place extent in relation to proposed construction.	VicRoads
ACH12	Construction adjacent to (within 50m) the following previously identified Aboriginal cultural heritage place: ▪ Western Highway 1	Following registration with VAHR, confirm precise place extent in relation to proposed construction.	VicRoads
ACH13	Construction encounters the following previously identified Aboriginal cultural heritage place: ▪ Western Highway 5	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage places.	VicRoads
ACH14	Construction encounters the following previously identified Aboriginal cultural heritage place: ▪ Western Highway 3	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage places.	VicRoads
ACH15	Construction immediately adjacent to (within 2m) the following previously identified Aboriginal cultural heritage place: ▪ Western Highway 4	Following registration with VAHR, confirm precise place extent in relation to proposed construction.	VicRoads
ACH16	Construction adjacent to (within 40m) the following previously identified Aboriginal cultural heritage place: ▪ Gorinn 1 (7523-001)	Determine precise place extent in relation to proposed construction.	VicRoads
ACH17	Construction encounters the following previously identified Aboriginal cultural heritage place: ▪ Western Highway 7	Following registration with VAHR, approvals must be obtained from relevant authorities prior to impacting the Aboriginal cultural heritage place.	VicRoads
ACH18	Construction adjacent to (within 35m) the following previously identified Aboriginal cultural heritage place: ▪ LG/ST 23 (7523-0109)	Determine precise place extent in relation to proposed construction.	VicRoads
ACH19	Construction encounters previously	Gain an approved CHMP.	VicRoads

Risk No	Risk Description	Management Measure s	Responsibility
	unregistered and unassessed common occurrence Aboriginal cultural heritage place.		
ACH20	Construction encounters previously unregistered and unassessed occasional occurrence Aboriginal place.	Gain an approved CHMP.	VicRoads
ACH21	Construction encounters previously unregistered and unassessed rare occurrence (e.g. burnt mounds) Aboriginal cultural heritage place.	Gain an approved CHMP.	VicRoads
ACH22	Construction encounters previously unregistered and unassessed mortuary tree Aboriginal cultural heritage place.	Construction design avoids impact.	VicRoads

21.7.8 Non-Aboriginal (Historical) Cultural Heritage

Table 21-24 Non-aboriginal (historical) cultural heritage objectives and indicators

HEADING	
▪ Minimise impacts to historic cultural heritage ▪ Comply with the *Heritage Act 1995*	▪ Project activities conducted in accordance with statutory approvals from Heritage Victoria.

Table 21-25 Extract of VicRoads Contract Shell DC1, Section 1200 Environment Protection (relating to non-aboriginal (historical) cultural heritage only)

HEADING	
1200.15	**Cultural Heritage**
(a)	General
	Cultural heritage sites and areas of cultural significance shall not be damaged, disturbed or otherwise adversely impacted unless an appropriate authorisation has been obtained.
	The work under the Contract shall be undertaken to comply with any statutory approvals from Heritage Victoria. Non-Aboriginal Cultural Heritage shall be protected from unauthorised disturbance during site establishment and construction.
(b)	Statutory Approvals
	The statutory approvals identified in Table 1200.151 have already been obtained, or are being obtained by VicRoads. The Contractor shall comply with the terms and conditions of these statutory approvals.

HEADING	
	Table 1200.151 – Statutory Approvals by the Principal (including Cultural Heritage Management Plans)

Site	Statutory Approval Number	Issuing Authority
Aboriginal Cultural Heritage		
Non-Aboriginal Cultural Heritage		

(c)	Cultural Heritage Sites
	Table 1200.152 lists known Cultural Heritage sites.

Table 1200.152

Site	Reference number	Chainage/AMG grid reference/location
Aboriginal Cultural Heritage		
e.g. Isolated artefact scatter:	e.g. AAV 7822 / 935:	e.g. E:321900, N:5828525:
Non-Aboriginal Cultural Heritage		
e.g. Dry-stone wall, stone shed foundations, corrugated iron:	e.g. H7822 / 0271:	e.g. E: 322650, N:5831175:

(d)	Protection of Cultural Heritage
	A 'No-Go Zone' shall be established for identified Cultural Heritage sites that are to be protected during the work under the Contract. Temporary fencing of 'No Go Zones' shall be: • constructed of, as a minimum, star pickets, single strand of wire at the top and paraweb; • located a minimum of 1 metre beyond the limit of the Cultural Heritage site; and • retained in place for the duration of the construction period (until Practical Completion), or until removal of the Cultural Heritage from the Site.
	Signage shall be installed on the temporary fencing at intervals no less than 20 metres apart stating 'Protected Area – No Unauthorised Access'.
(e)	Discovery of Cultural Heritage
	The following procedure will apply in the event of the discovery i.e. uncovering and/or identification of any Cultural Heritage during construction: ▪ immediate notification of the Superintendent; ▪ work at the immediate location to be suspended, and the site isolated by a 'No-Go Zone' as specified in Clause 1200.15(e), pending completion of an evaluation of the Cultural Heritage and the determination of an appropriate course of protective action; ▪ the Contractor shall evaluate the nature and extent of the Cultural Heritage. A Cultural Heritage Advisor shall be engaged to assist in this evaluation; ▪ work greater than 50 metres away from the area in which the Cultural Heritage was uncovered and/or identified may recommence and continue. Work in areas less than 50 metres from the Cultural Heritage site may proceed if agreed by the relevant Cultural Heritage Approval Authority, and in consultation with any other relevant cultural heritage stakeholders and the Superintendent; ▪ the Contractor shall consult with the Superintendent, relevant Cultural Heritage Approval Authorities, any monitor(s) on site and the Contractor's Cultural Heritage Advisor to determine the process to be followed to manage the discovered Cultural Heritage, and how to proceed with the works. The Superintendent's agreement shall be obtained to the proposed process for management of the discovered Cultural Heritage prior to implementation.

HEADING	
	▪ within 24 hours notify any monitor(s) on site, any engaged Cultural Heritage Advisor and the relevant Cultural Heritage Approval Authorities of the discovery of Cultural Heritage and its location; ▪ the Contractor shall obtain the relevant Cultural Heritage approval prior to any disturbance of Cultural Heritage discovered during construction and shall comply with all conditions of any such approval. Removal of any Cultural Heritage from the Site shall be undertaken in accordance with statutory requirements and relevant Cultural Heritage approval conditions; ▪ works may recommence in the relevant area if all relevant Cultural Heritage records have been updated and/or completed, and ○ works can resume without risk to the discovered Cultural Heritage, or ○ the discovered Cultural Heritage been removed from the relevant part of the works area, or ○ any agreed or stipulated Cultural Heritage management actions have been fully implemented.
(f)	Monitoring
	The Contractor shall undertake a visual assessment of the Site for Cultural Heritage during ground disturbing activities.
	The condition of heritage sites and protective measures at the sites shall be monitored at the following intervals: When construction activities are occurring within 10 m of the sites: Daily At other times: At least every 7 days

Table 21-26 Non-aboriginal (historical) cultural heritage summary management measures

Risk No	Risk Description	Management Measure s	Responsibility
CHH1	Construction encounters Major Mitchell's Cairn, a locally significant heritage feature or site (DSE local listing).	Submission to approvals authority (relevant LGA/DSE) prior to damaging, disturbing or otherwise impacting cultural heritage site to relocate site to an agreed area.	VicRoads
CHH2	Construction immediately adjacent to Woodnaggerak, a locally significant historical heritage feature or site.	Maintain current design and avoid site. No-go zones around site would be clearly marked on site maps and fenced if necessary.	VicRoads
CHH3	Construction immediately adjacent to Former Middle Creek School, an historical heritage feature or site (HI).	Maintain current design and avoid site. No-go zones around site would be clearly marked on site maps and fenced if necessary.	VicRoads
CHH4	Construction immediately adjacent to Former Prince of Wales Hotel Site, an historical heritage feature or site (HI).	Maintain current design and avoid site. No-go zones around site would be clearly marked on site maps and fenced if necessary.	VicRoads
CHH5	Construction encounters Peacock's Road House Ruins, an historical heritage feature or site (HI).	Approval obtained from Heritage Victoria prior to damaging, disturbing or otherwise impacting cultural heritage sites.	VicRoads
CHH6	Construction encounters the Former Colvinsby School site, an historical heritage feature or site (HI).	Approval obtained from Heritage Victoria prior to damaging, disturbing or otherwise impacting cultural heritage sites.	VicRoads
CHH7	Construction immediately adjacent to Former Dobie Railway Station, an historical heritage feature or site (HI).	Maintain current design and avoid site. No-go zones around site would be clearly marked on site maps and fenced if necessary.	VicRoads
CHH8	Construction immediately adjacent to Dobie House Ruins, an historical heritage feature or site (HI).	Maintain current design and avoid site. No-go zones around site would be clearly marked on site maps and fenced if necessary.	VicRoads
CHH9	Construction encounters previously unregistered and unassessed historical cultural heritage sites.	An EMP would be prepared to include contingency measures that manage the unexpected discovery of historical cultural heritage sites and features including reporting of the discovery to Heritage Victoria. Subsequent avoidance or approval from relevant authorities prior to damaging, disturbing or otherwise impacting cultural heritage sites would be sought.	VicRoads/ Contractor(s)

Middle Creek Complex- (Source: Andrew Long and Associates Pty Ltd)

21.7.9 Air Quality

Table 21-27 Air quality objectives and indicators

Objectives	Indicators
▪ Minimise dust and odour impacts on sensitive receivers ▪ Comply with State Environment Protection Policy (Air Quality Management)	▪ Dust monitoring results comply with contract specification section 1200.07 Air Quality clause (b) ▪ Community complaints relating to dust and/or odour

Table 21-28 Extract of VicRoads Contract Shell DC1, Section 1200 Environment Protection

Section	Description
1200.07	**Air Quality**
(a)	General
	All work under the Contract shall comply with the following requirements: ▪ emissions of visible smoke to the atmosphere from construction plant and equipment shall be for periods no greater than 10 consecutive seconds; ▪ emissions of odorous substances or particulates shall not create or be likely to create objectionable conditions for the public; ▪ materials of any type shall not be disposed of through burning; ▪ material that may create a hazard or nuisance dust shall be covered during transport; and ▪ dust generated from road construction activities shall not create a hazard or nuisance to the public, shall not disperse from the site or across roadways, nor interfere with crops, stock or dust-sensitive receptors.
(b)	Monitoring
	(i) General
	Monitoring shall comply with the following requirements: ▪ insoluble solids from any air quality monitoring station, as measured in accordance with the requirements of AS

<table>
<tr><th>Section</th><th>Description</th></tr>
<tr><td></td><td>3580.10.1 shall not exceed 4 g/m2/month or 2 g/m2/month above the background measurement, whichever is greater; and
▪ dust directional gauges shall be installed along side each air quality monitoring station and results measured in accordance with the requirements of AS 2724.5; and
▪ directional dust results shall be expressed as a % mass of insoluble solid for each direction sampled. Directional sampling shall be undertaken in accordance with AS 2724.5. The measurement of insoluble solids shall be undertaken in accordance with AS 3580.10.1; and
▪ monitoring equipment shall be established in accordance with AS 3580.10.1 and AS 2724.5.</td></tr>
<tr><td></td><td>The Contractor shall erect and maintain three/four/other: monitoring stations.</td></tr>
<tr><td></td><td>The Contractor shall ensure that all monitoring stations are secure from vandalism and tampering at all times.</td></tr>
<tr><td></td><td>Results of monitoring shall be submitted to the Superintendent within 24 hours of receipt from the laboratory.</td></tr>
<tr><td></td><td>(ii) Location</td></tr>
<tr><td></td><td>Monitoring equipment shall be located in accordance with the requirements of AS 3580.1.1.</td></tr>
<tr><td></td><td>Monitoring stations shall be at locations in the Site where air quality is likely to have the greatest impact on adjacent properties or create nuisance/inconvenience to the public. One monitoring station shall be a reference station placed at a location in proximity to the Site which is unaffected by works under the Contract.</td></tr>
<tr><td></td><td>(iii) Timing</td></tr>
<tr><td></td><td>A daily visual assessment of the Site for dust shall be undertaken at locations where works are being carried out.</td></tr>
<tr><td></td><td>Sampling frequency is based on the risk of generation of nuisance dust and is season dependent. Dust sampling frequency shall comply with Table 1200.071.</td></tr>
<tr><td></td><td>Table 1200.071<table><tr><td>Period</td><td>Sampling Frequency</td></tr><tr><td>November to March</td><td>14 day consecutive period</td></tr><tr><td>April to October</td><td>30 day consecutive period</td></tr></table></td></tr>
<tr><td></td><td>Hourly meteorological data for wind direction and velocity that correlates to the site location shall be obtained and maintained in the Contractor’s records, and made available to the Superintendent upon request.</td></tr>
<tr><td>(c)</td><td>Continuous Nuisance Dust Monitoring (Particulate Matter Monitoring) (strikethrough clauses if not required):</td></tr>
<tr><td></td><td>Continuous monitoring of nuisance dust shall be undertaken as particulate matter monitoring (PM10) in conjunction with dust deposition monitoring for insoluble solids as per Clause 1200.07(b).</td></tr>
<tr><td></td><td>(i) Monitoring of PM10 shall be conducted in accordance with the requirements of any of the following Australian Standards:
• AS 3580.9.6 (high volume sampler (HVS))
• AS 3580.9.7 (dichotomous sampler)
• AS 3580.9.8 (TEOM analyser)
• AS 3580.9.9 (low volume sampler (LVS))
• AS 3580.9.11 (beta attenuation monitor (BAM))</td></tr>
<tr><td></td><td>(ii) The concentration of PM_{10} shall be determined as a 24 hour average, from midnight to midnight, and shall not exceed 60 $\mu g/m^3$.</td></tr>
<tr><td></td><td>(iii) Where the PM_{10} method selected does not provide continuous readings, the monitoring programme shall be supplemented with a portable laser light scattering instrument, or equivalent, to allow changes to dust control measures if PM_{10} 1 hour average concentrations are such that the 60 $\mu g/m^3$ 24 hour average standard may not be achieved. The portable instrument shall be located downwind of road construction activities, adjacent to the nearest residential property, and shall provide an alarm if the 1 hour set point is exceeded. The output from the portable instrument shall not be used to establish compliance with the 24 hour average standard.</td></tr>
<tr><td></td><td>(iv) Sampling frequency shall comply with Table 1200.072.</td></tr>
<tr><td></td><td>Table 1200.072<table><tr><td>Period</td><td>Sampling Frequency</td></tr><tr><td>November to March</td><td>Continuous or 1 in 2 days/3 days (edit as applicable):</td></tr><tr><td>April to October</td><td>Continuous or 1 in 6 days</td></tr></table></td></tr>
</table>

<table>
<tr><th>Section</th><th>Description</th></tr>
<tr><td>(d)</td><td>Human Health Impacts (delete clauses if not required – refer to Environmental Sustainability for advice prior to including this clause):</td></tr>
<tr><td></td><td>(i) If soil contamination is detected during road construction activities, the extent of contamination and the contaminants present shall be determined. The Contractor shall consult with the Superintendent to establish the requirements for Environment Protection Authority notification and to establish an appropriate ambient air quality monitoring programme scope.</td></tr>
<tr><td></td><td>(ii) If soil contaminated with metals is detected during road construction activities, total suspended particulate matter (TSP) sampling shall be conducted in accordance with Australian Standard AS 3580.9.3. The concentration of TSP shall be determined as a 24 hour average, from midnight to midnight. Sampling frequency shall depend upon the season, and hence the risk of TSP generation, and shall be determined by reference to Table 1200.073.</td></tr>
<tr><td></td><td>Table 1200.073
<table><tr><td>Period</td><td>Sampling Frequency</td></tr><tr><td>November to March</td><td>1 in 2 days/3 days (edit as applicable):</td></tr><tr><td>April to October</td><td>1 in 6 days</td></tr></table></td></tr>
</table>

Table 21-29 Air quality summary management measures

Risk No	Risk Description	Management Measure s	Responsibility
A1	Construction emissions impact an individual sensitive receptor. Exceedance of State Environment Protection Policy (Air Quality Management) within a local area, Aeolian transport and deposition potentially affecting human health, flora, fauna, visual and social aspects and water quality. The impact zone for construction dust where an exceedence of the SEPP (AQC) may occur is: ▪ North of the Project, a line of up to 395 m from the edge of the construction zone and running parallel to the boundary. ▪ South of the Project, a line of up to 460 m from the edge of the construction zone and running parallel to the boundary.	Comply with section 1200.07 Air Quality of the VicRoads contract specification. In the impact zone for construction dust where an exceedence of the SEPP (AQC) may occur the following additional mitigation measures would be implemented: ▪ Implement methods and management systems (including continuous air monitoring) to maintain air quality during construction consistent with State Environmental Protection Policy (Air Quality Management) intervention levels for particulates and EPA Best Practice Environmental Management - Environmental Guidelines for Major Construction Sites (1996). ▪ Implement a dust management protocol as described in Technical Appendix L, including minimising land disturbance by using a staged approach and rehabilitating cleared areas promptly, applying dust suppression measures and keeping vehicles to well-defined haul roads, limiting vehicle speed and sealing haul roads and other exposed areas by means of concrete or paving where necessary.	Contractor(s)
A2	Construction emissions impact a local area (community) such as: ▪ McKinnon Lane, Beaufort (Ch. 800 - 1,000) ▪ Woodnaggerak/Middle Creek Road Community, Middle Creek (Ch. 10,400 - 12,800) ▪ Buangor Township, Between Andersons/Gravel Route Roads, Buangor (Ch. 16,400 - 20,000) ▪ Geelong Road Community, Ararat (Ch. 35,200 - 40,400) Exceedance of State Environment Protection Policy (Air Quality Management) within a local area, Aeolian transport and deposition potentially affecting human health, flora, fauna, visual and social aspects and water quality. The impact zone for construction dust where an exceedence of the	As per Risk A1 Dust deposition gauges would be used to judge effectiveness of the CEMP, and evaluate implementation of further controls such as halting works under certain conditions.	Contractor(s)

Risk No	Risk Description	Management Measure s	Responsibility
	SEPP (AQC) may occur is: ▪ North of the Project, a line of up to 395 m from the edge of the construction zone and running parallel to the boundary. ▪ South of the Project, a line of up to 460 m from the edge of the construction zone and running parallel to the boundary.		
A3	Construction emissions deposit on residential housing that drain into domestic water supplies (i.e. tank water).	As per Risk A1 Where concerns are raised by land owners and if warranted, sensitive receptors with rain water supplies would be encouraged to have 'first' flush devices' installed between the water runoff and tank.	Contractor(s)
A4	Construction emissions deposit of Agricultural/Horticultural businesses at an individual sensitive receptor location.	Implement a dust management protocol as described in Technical Appendix L, including minimising land disturbance by using a staged approach and rehabilitating cleared areas promptly, applying dust suppression measures and keeping vehicles to well-defined haul roads, limiting vehicle speed and sealing haul roads and other exposed areas by means of concrete or paving where necessary.	Contractor(s)
A5	Operation of the Western Highway generates air emissions from vehicular traffic.	Air quality issues during operation would be identified through public liaison and complaints received. Management measures would be implemented as required.	VicRoads

21.7.10 Noise

Table 21-30 Noise objectives and indicators

Objectives	Indicators
▪ Minimise noise and vibration impacts on sensitive receivers ▪ Comply with EPA Publication 1254 'Noise Control Guidelines'.	▪ Noise monitoring results comply with EPA Publication 1254 'Noise Control Guidelines' ▪ Community complaints relating to noise and vibration

Table 21-31 Extract of VicRoads Contract Shell DC1, Section 1150 Works Affecting the Public and Section 1200 Environment Protection

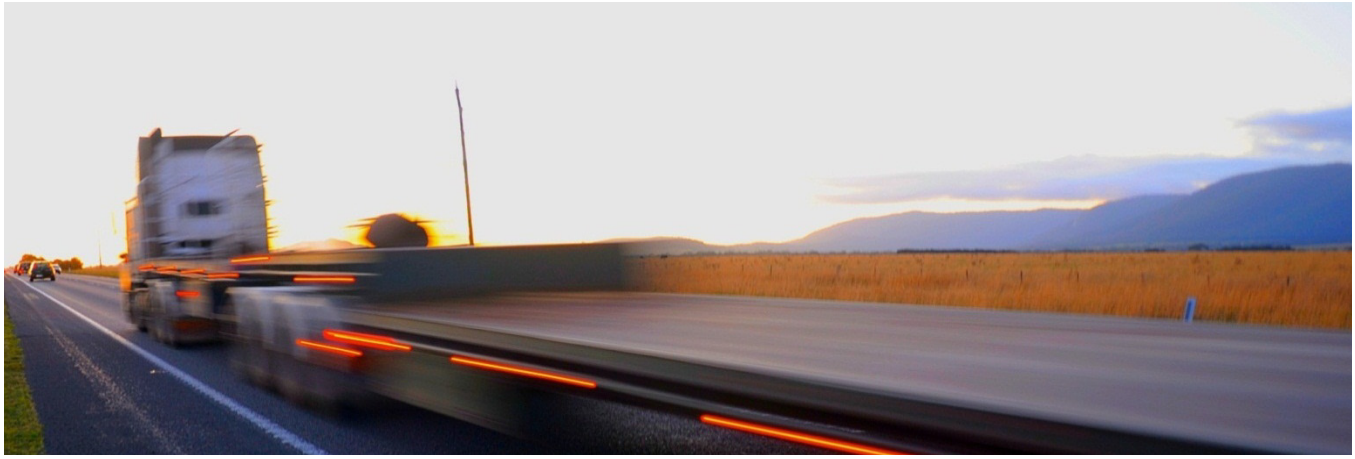
Section	Description
1150.01	**Working Hours** For the purpose of this clause, 'work' shall be defined as any activity other than office bound duties, including the starting up of plant and machinery. Before commencing work under the Contract, the Contractor shall advise the Superintendent, in writing, the working hours proposed for the execution of the work under the Contract. Further to the provisions of the General Conditions of Contract:
(a)	No work shall be carried out on any Sunday, public holiday, between Good Friday and Easter Monday inclusive, or during the Christmas to New Year period;
(b)	No work shall be carried out on the Site outside the period between 7am or sunrise, whichever is the later, and 6pm or sunset, whichever is the earlier. The Contractor may seek approval from the Superintendent to undertake work outside of the proposed working hours in the following situations: (i) where a utility service owner stipulates work on its assets is to be performed outside of the proposed working hours; (ii) where work outside of the proposed working hours is required to meet the traffic management requirements of Section 1160 of this specification; (iii) where track manager/s, VicTrack and/or the Director of Public Transport stipulate that work on railway property or infrastructure is to be performed outside the proposed working hours. Work outside the proposed working hours without written approval of the Superintendent may proceed only in the following situations: ▪ in cases of emergency; ▪ where situations would create significant traffic disruption and/or hazardous conditions unless rectified; ▪ when plant breakdown or extenuating circumstances have delayed an activity that cannot be stopped. In the event that it becomes apparent that the working hours are to be exceeded by more than 30 minutes, or work is required out of hours in an emergency, the Contractor shall have a process in place that will immediately: ▪ notify and obtain approval from the Superintendent; ▪ where required by the Superintendent, notify the Environment Protection Authority; and ▪ advise surrounding property owners/occupiers that will be disturbed by any activity. The Contractor shall be responsible for ascertaining the ability to complete any activity within the working hours prior to commencing the activity. Late commencement of an activity will not be considered due cause for exceeding the restricted working hours and in such circumstances, the Superintendent may direct cessation of the activity. In this situation, no consideration will be given to any claim from the Contractor for loss of time or any associated costs.
1150.04	**Ground Vibration** The Contractor shall employ construction methods that minimise ground vibrations near existing buildings, structures, rail infrastructure and overhead and underground services. Ground particle velocities shall be measured by the Contractor immediately adjacent to any building, structure, rail infrastructure or utility service which might be damaged by vibrations. The Contractor shall bear all costs associated with any claim for damages resulting from the effects of ground vibration attributable to the Contractor's construction methods or work.
1200.12	**Noise**
(a)	General All work under the Contract shall comply with the following requirements: ▪ hours of work shall be in accordance with Clause 1150.01; ▪ construction vehicles and equipment shall have appropriate measures fitted and be effectively maintained to minimise engine noise; ▪ noisy equipment shall be enclosed where possible; ▪ consideration shall be given to scheduling noisy work practices (e.g. pile driving) to minimise likelihood of community annoyance; and ▪ use of smart movement alarms for vehicles particularly in noise sensitive areas and/or where working

Section	Description
	outside normal hours.
(b)	Monitoring: Construction noise emanating from the Site shall be monitored. Monitoring stations shall be located at residential and other premises where the impact of construction noise is likely to create substantial nuisance or inconvenience to the occupants/public. The Contractor shall engage a suitably qualified acoustic consultant to determine the location of monitoring stations.

Table 21-32 Noise summary management measures

Risk No	Risk Description	Management Measures	Responsibility
N1	Daytime construction of Western Highway at an individual sensitive receptor. Normal working hours under EPA Publication 1254 - Guidelines for Noise Control (2008) are: ▪ 7 am -6 pm Monday to Friday ▪ 7 am -1 pm Saturdays	Comply with section 1200.12 Noise and section 1150.01 Working Hours of the VicRoads Contract Specifications Contractor to implement a communication strategy with the key stakeholders and the community to manage the impacts of construction noise and limit disturbance to local amenity. Contractor to implement a noise mitigation strategy for construction activities with consideration to the EPA Publication 480 - Environmental Guidelines for Major Construction Sites (1996) and EPA Publication 1254 - Guidelines for Noise Control (2008), as well as, referring to 'Typical Construction Plant and Equipment Noise Attenuation Over Distance' table, contained in the EES Noise and vibration Impact Assessment Report (GHD, 2012g).	Contractor(s)
N2	Daytime construction of Western Highway near sensitive receptors (i.e. more than one receptor) in a local area (community) such as: ▪ McKinnon Lane, Beaufort (Ch. 800 - 1,000) ▪ Woodnaggerak/Middle Creek Road Community, Middle Creek (Ch. 10,400 - 12,800) ▪ Buangor Township, Between Andersons/Gravel Route Roads, Buangor (Ch. 16,400 - 20,000) ▪ Geelong Road Community, Ararat (Ch. 35,200 - 40,400)	As per Risk N1	Contractor(s)
N3	Evening construction of Western Highway	As per Risk N1; and Evening and weekend works may occur at certain stages during the Project. If the contractor is required to undertake work during evening or weekend times, this would need to be approved by the VicRoads Superintendent. A condition of VicRoads approval would be that all relevant stakeholders are consulted including nearby residents. In the event that it becomes apparent that the working hours are to be exceeded by more than 30 minutes, or work is required out of hours in an emergency, the Contractor would have a process in place that would immediately: ▪ notify and obtain approval from the Superintendent; ▪ where required by the Superintendent, notify the Environment Protection Authority; and ▪ advise surrounding property owners/occupiers that would be disturbed by any activity. ▪ Should 'unavoidable works' be required for evening or night time work, then where possible section 5.2.2 (b) and (c) of the VicRoads Noise Guidelines – Construction and Maintenance Works 2007 would be adhered to.	Contractor(s)
N4	Night time construction of Western Highway	As per Risk N1 and N3	Contractor(s)

Risk No	Risk Description	Management Measures	Responsibility
N5	Site compounds and laydown areas during construction	As per Risk N1 and N3	Contractor(s)
N6	Vibration caused by construction of Western Highway	Comply with section 1150.04 Ground Vibration of the VicRoads Contract Specifications. If construction works causing vibration are required within 50 m of a sensitive receptor (building) a construction vibration assessment would be undertaken prior to works being carried out and appropriate methods of construction employed to minimise impacts. Timing of the works to be conducted during the recommended operational hours, to reduce vibration levels to residential properties. Residents to be made aware of the construction times and the duration they would likely be affected, through letterbox drops, personal meetings and community meetings. Residents to be pre-warned of high vibration events (e.g. piling operations), and any operations being undertaken outside recommended hours. Public notification would be given a minimum of 72 hours prior to planned works. As a precaution the contractor would undertake a dilapidation survey for any buildings, structures or utilities located within 50 m of construction works. Equipment operators to be made aware of potential vibration issues problems and of techniques to minimise vibration effects during construction works.	Contractor(s)
N7	Operation of the Western Highway generates noise emissions from vehicular traffic Areas where the VicRoad Traffic Noise Reduction Policy 2005 Applies	Limit potential noise production during design stage through the use of alignment shifts, pavement materials, speed limits and other such items as required. Adhere to VicRoads Traffic Noise Reduction Policy 2005: Noise attenuation would be considered for sensitive receptors that exceed 63 dB(A) (and the Policy is found to apply) Consideration for retrofitting (e.g. double glazed windows, barriers) would be given where noise levels at sensitive receptors exceed 68 dB(A) (and the Policy is found to apply). Where a "new alignment" as described in the VicRoads Traffic Noise Reduction Policy (2005) is constructed (and the Policy is found to apply), noise monitoring to check compliance with the policies noise level objectives for Category A and B sensitive receptors would be carried out. Where the noise criteria outlined in the Traffic Noise Reduction Policy (2005) are exceeded, mitigation works as outlined in the policy would be carried out as required.	VicRoads
N8	Operation of the Western Highway generates noise emissions from vehicular traffic. Areas where the VicRoads Traffic Noise Reduction Policy 2005 Does Not Apply.	Limit potential noise production during design stage through the use of alignment shifts, pavement materials, speed limits and other such items as required.	VicRoads



21.7.11 Visual and Landscape

Table 21-33 Visual and landscape objectives and indicators

Objective	Indicators
▪ Minimise landscape and amenity impacts	▪ Landowners informed of any potential disruption to amenity from construction activities ▪ Landscaping for the Project undertaken in accordance with the VicRoads Roadside Planting Guidelines (VicRoads 2010)

Table 21-34 Extract of VicRoads Contract Shell DC1, Section 3060 Landscape and Architectural Elements

Section	Description
3060.03	**References**
(a)	General Unless otherwise specified, all landscape and architectural works would be designed and implemented in accordance with the references listed in Table 3060.031 (listed below). The reference would be the edition or version current at the closing of tenders, unless otherwise specified. ▪ VicRoads Standard Specifications for Roadworks and Bridgeworks ▪ Austroads Guide to Road Design - Part 3: Geometric Design and VicRoads Supplement to AGRD Part 3 ▪ Austroads Guide to Road Design - Part 4: Intersections and Crossings General and VicRoads Supplement to AGRD Part 4 ▪ Austroads Guide to Road Design - Part 4A: Signalised and Unsignalised Intersections and VicRoads Supplement to AGRD Part 4A ▪ Austroads Guide to Road Design - Part 6A: Pedestrian and Cyclist Paths and VicRoads Supplement to AGRD Part 6A ▪ Austroads Guide to Road Design - Part 6B: Roadside Environment and VicRoads Supplement to AGRD Part 6B ▪ VicRoads Standard Drawings for Roadworks ▪ VicRoads Final Drawing Presentation Guidelines ▪ RCA Technical Bulletin No. 36 - A Guide to Tree Planting with Road Reserves ▪ VicRoads Roadside Management Guide

Table 21-35 Visual and landscape summary management measures

Risk No	Risk Description	Management Measures	Responsibility
LV1A	Construction and operation of the duplication along the existing Western Highway alignment will visually impact upon adjacent dwellings. (Ch. 400-1800, 8700, 10500-10900, 12400-12800, 14600-15400 and 38400-38000)	Provide planting in duplication Right of Way (ROW). Retention of existing roadside vegetation where possible (protective fencing treatments may be required). Establishment of tree and shrub planting of similar character to existing roadside vegetation in close proximity to the road edge (protective fencing treatments may be required). Establishment of clusters of screening vegetation in line with the surrounding character, including trees at the toe of the embankment shrubs upon the fill embankments. Use of grasses upon fill embankments consistent with surrounding rural land. Landscape designed fill embankments. Establishment of a new tree avenue gateway to Ararat (to be developed in conjunction with Ararat Rural City Council).	VicRoads and Contractor(s)
LV1B	Construction and operation of the duplication along a new alignment will visually impact upon adjacent dwellings. (Ch. 900 and 2600)	Provide planting in ROW. Establishment of screening vegetation against eastern views for the affected dwelling. Use of grasses upon fill embankments consistent with surrounding rural land. Landscape designed fill embankments.	VicRoads and Contractor(s)
LV1C	Construction and operation of a new overpass along the existing Western Highway alignment will visually impact upon an adjacent dwelling. (Ch. 4400-5600)	As per Risk LV1B.	VicRoads and Contractor(s)

Risk No	Risk Description	Management Measures	Responsibility
LV1D	Construction and operation of a new overpass along the existing Western Highway alignment will visually impact upon an adjacent dwelling. (Ch. 17400-21000)	Provide planting in ROW. Establishment of tree and shrub screening planting to effectively screen the duplication and maintain a vegetated edge to the township. Vegetation would be established in clumps and not in linear banding that contrasts with the existing landscape character. Tree planting along the base and shrub planting along embankments to screen the overpass. Possible screen planting within private properties along the interface of the overpass. Sensitive design of embankments to be complimentary to the surrounding topography.	VicRoads and Contractor(s)
LV1E	Construction and operation of the duplication along a new alignment will visually impact upon adjacent dwellings. (Ch. 24200)	Provide planting in ROW. Establishment of screening vegetation within private properties. Landscape designed fill embankments.	VicRoads and Contractor(s)
LV2A	Construction and operation of the duplication will visually impact upon the Buangor Town Centre (Ch. 18300).	Provide planting in ROW. Establishment of tree and shrub screening planting to effectively screen the duplication and maintain a vegetated edge to the township. Vegetation should be established in clumps and not in linear banding that contrasts with the existing landscape character.	VicRoads and Contractor(s)
LV2B	Construction and operation of the duplication will visually impact upon the Buangor Primary School (Ch. 18100).	Provide planting in ROW. Establishment of tree and shrub screening planting to effectively screen the duplication and maintain a vegetated edge to the township. Vegetation would be established in clumps and not in linear banding that contrasts with the existing landscape character. Tree planting along the base and shrub planting along embankments to screen the overpass. Sensitive design of embankments to be complimentary to the surrounding topography. Use of grasses upon fill embankments consistent with surrounding rural land. Landscape designed fill embankments.	VicRoads and Contractor(s)
LV2C	Construction and operation of the duplication will visually impact upon the approaches to the Buangor Town Centre (Ch. 15800-20800).	Provide planting in ROW. Establishment of tree and shrub screening planting to effectively screen the duplication and maintain a vegetated edge to the township. Vegetation would be established in clumps and not in linear banding that contrasts with the existing landscape character; Tree planting along the base and shrub planting along embankments to screen the overpass; Sensitive design of embankments to be complimentary to the surrounding topography.	VicRoads and Contractor(s)
LV2D	Construction and operation of the duplication will visually impact upon Mount Buangor State Park and Mount Cole State Forest	Provide planting in ROW.	VicRoads and Contractor(s)
LV2E	Construction and operation of the duplication will visually impact upon the Langhi Ghiran State Park (Ch. 22600-29400).	Provide planting in ROW.	VicRoads and Contractor(s)
LV2F	Construction and operation of the duplication will visually impact upon Green Hill Lake (Ch. 37000-38400).	Provide planting in ROW.	VicRoads and Contractor(s)
LV2G	Construction and operation of the duplication will visually impact upon the Ararat Regional Park Lookout.	Provide planting in ROW.	VicRoads and Contractor(s)
LV3A	Construction and operation of the duplication will visually impact upon landscape character types of high landscape sensitivity (Ch. 18100-18300).	Provide planting in ROW.	VicRoads and Contractor(s)
LV3B	Construction and operation of the duplication will visually impact upon	Provide planting in ROW.	VicRoads and

Risk No	Risk Description	Management Measures	Responsibility
	landscape character types of high landscape sensitivity (Ch. 27200-27600).		Contractor(s)
LV3C	Construction and operation of the duplication will visually impact upon landscape character types of medium-high landscape sensitivity. Option 1 (Ch. 1200-3600, 17400-18100, 18300-20600 and 22800-28600). Option 2 (Ch. 1200-3600, 17400-18100 and 18700-20500 and 22500-25200).	Provide planting in ROW. Establishment of clusters of screening vegetation in line with the surrounding character, including trees at the toe of the embankment and shrubs upon the fill embankments. Use of grasses upon fill embankments consistent with surrounding rural land. Landscape designed fill embankments.	VicRoads and Contractor(s)
LV3D	Construction and operation of the duplication will visually impact upon landscape character types of medium landscape sensitivity. (Ch. 4200-5400).	As per Risk LV3C	VicRoads and Contractor(s)
LV3E	Construction and operation of the duplication will visually impact upon landscape character types of medium to high landscape sensitivity. (Ch. 9700).	As per Risk LV3C	VicRoads and Contractor(s)
LV3F	Construction and operation of the duplication will visually impact upon landscape character types of medium to high landscape sensitivity. (Ch. 1400-2700).	Provide planting in ROW.	VicRoads and Contractor(s)
LV3G	Construction and operation of the duplication will visually impact upon landscape character types of low landscape sensitivity. Option 1 (Ch. 847-1200, 3200-4500, 10000-12800 and 39100-39600) Option 2 (Ch. 847-1200, 3200-4500, 10000-12800 and 39100-39600	Provide planting in ROW. Retention of existing roadside vegetation where possible (protective fencing treatments may be required). Establishment of tree and shrub planting of similar character to existing roadside vegetation in close proximity to the road edge (protective fencing treatments may be required). Establishment of a new tree avenue gateway to Ararat (to be developed in conjunction with Ararat Rural City Council).	VicRoads and Contractor(s)

Western Highway, Box's Cutting –looking west

21.7.12 Social

Table 21-36 Social objectives and indicators

Objectives	Indicators
▪ Minimise amenity impacts to individuals and communities during construction and operation ▪ Minimise severance and accessibility changes and dislocation of individuals and communities	▪ A process is established for receiving and responding to community complaints ▪ Potentially affected individuals and the communities are consulted regarding the construction and operation of the Project

Table 21-37 Extract of VicRoads Contract Shell DC1, Section 1200 Environment Protection

Section	Description
1200.07	Air Quality (refer to Section 21.7.8)
1200.08	Erosion and Sediment Control (refer to Section 21.7.3)
1200.12	Noise (refer to Section 21.7.10)
1150.01	Working Hours (refer to Section 21.7.10)
1160	Traffic Management (refer to Section 21.7.2)

Table 21-38 Social summary management measures

Risk No	Risk Description	Management Measures	Responsibility
S1	The Project may lead to changes to the existing social and community conditions by creating pressures for the settlement pattern to change.	No specific management measures are proposed as this risk is managed through the local planning scheme.	NA
S2	The Project may lead to changes to the existing social and community conditions by changing the distribution of residents in the vicinity of the Highway.	As per S1	NA
S3	The Project may lead to changes to the existing social and community conditions by changing the distribution of residents in the vicinity of the Highway.	As per S1	NA
S4	The Project may change the existing social and community conditions by creating change processes which affect the demographic characteristics of the study area.	As per S1	NA
S5	The Project and changes to access arrangements may lead to changes to the existing social and community conditions by changing patterns of community interaction and use of social foci.	Consultation with Council and the local community has been undertaken during the planning for this project to determine access requirements. Consultation with the community regarding disruptions to access during construction.	VicRoads and Contractor(s)
S6	The Project may affect local residents and communities during the construction stage.	As per Air Quality, Geology (Contamination), Noise, and Traffic controls described in Risks A1, G2, G5, N3, T1. Protocols would be developed as part of the CEMP for liaising with adjacent land owners, to keep them fully informed about construction activities in their area, and any potential disruption to their access and amenity.	VicRoads and Contractor(s)
S7	The Project may lead to effects on places with particular cultural, recreational or aesthetic values, particularly with	The project is being designed to minimise impact at the Woodnaggerak homestead site. The alignments avoid the Major Mitchell historical marker and the Cobb and Co Staging Stables building. The new alignment would be designed to minimise noise impacts	VicRoads

Risk No	Risk Description	Management Measures	Responsibility
	regard to significant regional locations.	at the recreation reserve in Buangor.	
S8	The Project may create a risk of dislocation for individuals and communities.	Property acquisition would be managed in accordance with the *Land Acquisition and Compensation Act*. Where properties are severed to an unworkable size, VicRoads would work with landowners and Council to determine appropriate solutions.	VicRoads
S9	The Project may create a risk of severance and accessibility changes for individuals and communities	Service roads are required for a Freeway Standard road and have been included in the project developed for initial assessment in the EES to maintain all property access. VicRoads would liaise with landholders regarding access arrangements for driveways and access points. Access to Buangor would be maintained.	VicRoads
S10	The Project may create risks of reduction of amenity (in relation to visual amenity, noise other changes to the character of the area) to individuals and communities.	Amenity risks would be minimised through detailed design. Acquisition of properties may also be considered where appropriate	VicRoads
S11	The Project may create risks of reduction of amenity (in relation to visual amenity, noise other changes to the character of the area) to individuals and communities.	As per risk S11.	VicRoads
S12	The Project may create risks of reduction of amenity (in relation to visual amenity, noise other changes to the character of the area) to individuals and communities.	Selection of Option 1 would prevent these impacts from occurring. If Option 2 is selected, the detailed design would aim to minimise the long-term negative impact at these locations. Otherwise, consideration would be given to acquiring these properties in total, so that the owners could relocate, depending on their preference. Design the project to comply with VicRoads Traffic Noise Reduction Policy, February 2005.	

21.7.13 Economic

Table 21-39 Economic objectives and indicators

Objectives	Indicators
▪ Continuous access to commercial properties during business operating hours ▪ Minimise reduction in passing trade for businesses ▪ Minimise loss of land, severance and access	▪ Construction schedules developed in consultation with businesses ▪ Compensation provided where loss of land, severance or access has occurred

Table 21-40 Economic summary management measures

Risk No	Risk Description	Management Measure s	Responsibility
E1	The Project has the potential to reduce passing trade levels for some businesses (Buangor).	New signage would be installed for any business areas affected by the reduction in passing trade and for creating an awareness	VicRoads
E2	The Project would result in the loss of agricultural facilities and infrastructure, plus loss of agricultural land and severance of properties across the alignment.	Compensation measures would be provided for loss of infrastructure, land, severance and access issues.	VicRoads
E3	The Project would disrupt access to agricultural businesses during its construction.	Communicating with businesses would occur to optimise construction schedules.	VicRoads

21.8 Compliance

VicRoads would undertake environmental monitoring for the Project and surveillance of its construction contractor(s). The contract specification(s) would include compliance requirements for the construction contractor(s) including reporting to VicRoads and external environmental auditing.

21.8.1 Monitoring

A summary of results of environmental monitoring and studies conducted subsequent to the EES would be communicated through forums including a project website and community information bulletins. Results of monitoring and studies would also be forwarded to relevant government agencies to contribute to the improvement of environmental knowledge.

Environmental monitoring would include:

- Monitoring of erosion and scour and the effectiveness of erosion and sediment controls as per Section 21.7.3.
- Monitoring of chemical and fuel handling and storage as per Section 21.7.3.
- Groundwater monitoring as per Section 21.7.4.
- Surface water quality monitoring as per Section 21.7.5.
- Monitoring for flora and fauna as per section 21.7.6.
- Air quality (dust) monitoring as per Section 21.7.8.
- Construction noise monitoring as per Section 21.7.10.
- Monitoring of how community complaints are addressed.

21.8.2 Reporting

A monthly report would be provided to VicRoads by the construction contractor(s) outlining the performance and effectiveness of the EM Strategy and CEMP(s) as well as an other items specifically required by VicRoads. This report would include external and internal audit findings, monitoring results and incidents and non-compliances.

21.8.3 External Audit

The construction contractor(s) would be required to engage an independent, suitably qualified and experienced auditor to conduct audits of implementation of the contract specification. The first audit would be completed prior to commencement of construction works to confirm that the EM Strategy and CEMP(s) conform to the contract specification and that proposed controls and procedures are consistent with best practice environmental guidelines. Compliance audits would then be completed on a quarterly basis during construction.

21.8.4 Revisions to Environmental Documentation

Revisions to the construction contractor(s) environmental documentation may be required as a result of changes in activities and work practices, legislation, aspects and impacts, or as a result of internal or external audit findings, incidents or complaints. The construction contractor(s) would be required to submit all major revisions to environmental documentation to VicRoads for approval. Major revisions are defined as changes that affect work practices, roles and responsibilities, environmental risks and overall project delivery. Minor revisions are defined as addressing typographical errors, formatting and other administrative changes.

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