

APPENDIX C: MANAGEMENT MEASURES

C.1 FINAL OPTIONS

VicRoads preferred option is shown in Figure 1. This option is described in detail in Chapter 3.

C.2 GENERAL

This chapter outlines VicRoads' environmental framework for managing the potential environmental impacts of the Outer Metropolitan Ring / E6 Transport corridor and ensuring the successful implementation of proposed mitigation measures.

C.2.1 POLICY AND GUIDELINES

This is reflected in VicRoads Environment Strategy 2005-2015 and Environment Policy 2005 (Appendix 5.1), which both commit VicRoads to:

- > Improving the liveability of communities;
- > Protecting and enhancing the natural and cultural environment; and
- > Being an environmentally responsible organisation.

VicRoads Project Management Guidelines – Environmental Protection (VicRoads, 2000) outlines the processes for protecting the environment during the planning, development and construction of road projects.

These guidelines are a management tool used to:

- > demonstrate and explain the process used by VicRoads to protect the environment on road improvement projects;
- > assist VicRoads staff in developing a systematic approach for managing environmental issues such as dust generation and site runoff to ensure VicRoads responds to its environmental obligations in a logical, practical and positive manner;
- > ensure environmental impacts and risks are proactively identified, addressed and managed to achieve a successful outcome; and
- > monitor the compliance of contractors engaged by VicRoads to undertake the physical works with their contractual and statutory environmental obligations.

C.3 ENVIRONMENTAL MANAGEMENT FRAMEWORK

Through a strong organisational commitment to an open, transparent, accountable and systematic environmental management framework, founded on the principles of continual improvement, VicRoads aims to consistently achieve sound environmental performance.

An overview of the key elements of the environmental management framework is provided as follows:

C.3.1 VICROADS ENVIRONMENTAL MANAGEMENT TOOLKIT

VicRoads has developed a series of Business Toolkits for its critical corporate functions, including environmental management. The Environmental Management Toolkit identifies all critical environmental policies, procedures and guidelines that VicRoads need to consider during the planning, development and delivery of its projects.

The Environmental Management Toolkit is supported by VicRoads Environmental Information System. This system contains a register of all environmental legislation relevant to VicRoads and VicRoads Environmental Incident Reporting System.

C.3.2 PLANNING PHASE

This phase identifies planning and environmental issues associated with the project and seeks the necessary environmental clearances and statutory approvals. In the case of the Outer Metropolitan Ring / E6 Transport corridor, the preparation and exhibition of an EES referral document followed by the Minister for Planning's decision on the referral under the *Environment Effects Act 1978*, the undertaking of required actions in relation to the Minister for Planning's decision on the referral and the approval of a Planning Scheme Amendment by the Minister for Planning are the relevant State environmental and planning clearance mechanisms for the Outer Metropolitan Ring / E6 Transport Corridor.

Following public comment on a draft Impact Assessment, the Department of Sustainability and Environment will submit an Impact Assessment under the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* to the Commonwealth Minister for Environment and Heritage regarding the expansion of Melbourne's urban growth boundary, the construction and operation of the Outer Metropolitan Ring / E6 Transport corridor and the Regional Rail Link from West Werribee to Caroline Springs.

The Commonwealth Minister's decision is anticipated to provide further direction to further work required to satisfy Commonwealth environmental requirements.

C.3.3 PRE CONSTRUCTION PHASE

The following processes will ensure that specific environmental issues and mitigation measures identified in this PAR are incorporated into the Project Environmental Protection Strategy (PEPS). The PEPS is used to ensure that the Contractor who is undertaking the physical works develops, implements and maintains effective environmental management controls and procedures to address these issues and obligations. (**Note:** the following discussion is based upon the use of a Design and Construct contract. Should another form of contract be used, then similar principles will need to be applied) Key components of this phase include:

C.3.3.1 PROJECT ENVIRONMENT PROTECTION STRATEGY

VicRoads will prepare a Project Environmental Protection Strategy (PEPS). This will identify, among other things, the management processes to be utilised for the project, the environmental risks, and the associated objectives and commitments associated with permits/approvals. The PEPS is used to ensure that the development of the Contract Specification suitably addresses all identified risks.

C.3.3.2 CONTRACT DOCUMENTATION

The Contractors will be largely responsible for determining the program of works and the construction procedures and methodology to be adopted in the context of specified performance requirements.

VicRoads specification places stringent requirements on Contractors undertaking the works. The Contractor will be required to demonstrate that a thorough risk appraisal will be conducted for all aspects of the project including safety, quality and environment protection strategies. Special contract clauses will also be included in the Contract to address site specific issues and implementation of mitigation measures outlined in this PAR document.

C.3.3.3 PREQUALIFICATION OF CONTRACTORS

Construction of the Outer Metropolitan Ring / E6 Transport Corridor will be undertaken by private sector contractors. Contractors wishing to tender for VicRoads work of value greater than \$100,000 must first be listed on VicRoads Prequalification Scheme. The Prequalification Scheme is an ongoing process in which Contractors are assessed and categorised according to their experience and technical, financial and management capacity. This Scheme includes a requirement for Contractors to demonstrate that they operate an effective environmental management system in accordance with ISO14001 – Environmental Management Systems, supported by a declaration from a suitably qualified environmental auditor stating that the Contractor’s system complies with VicRoads requirements.

Contracts for major projects like the Outer Metropolitan Ring / E6 Transport Corridor are typically advertised at the highest level of the Prequalification Scheme and therefore only the most experienced and capable Contractors are able to undertake the works.

C.3.4 CONSTRUCTION PHASE

VicRoads management systems operate to ensure that Contractors engaged for construction works are monitored and their performance is reported to management regularly. This ensures that the works are being conducted in an environmentally sensitive manner and that specified performance requirements are being achieved. Key components of this phase include:

C.3.4.1 VICROADS SURVEILLANCE AND AUDIT PLAN

Following contract award, VicRoads will prepare a Surveillance and Audit Plan based on the initial construction risk identification outlined later in this chapter (Section C.10), the Contractor’s proposed program of works and its proposed construction techniques. The Surveillance & Audit Plan will detail frequency, responsibilities and level or intensity of surveillance appropriate for the construction activity relating to the identified risk.

Site specific checklists are also prepared for each contract based on the construction risk assessment and the contract specification. These checklists will be included in the Surveillance & Audit Plan. Surveillance utilising the checklists will be conducted by VicRoads in accordance with the Surveillance & Audit Plan.

Surveillance & Audit Plans will be reviewed on a regular basis and revised as necessary, to ensure that the actual activities occurring on site are being appropriately managed by the Contractor in accordance with the contract specifications and its Contractor Environmental Management Plans (CEMPs).

The stages of review (and revision as necessary) of the Surveillance & Audit Plan will occur as follows:

- > subsequent to the Contractor's submission of a detailed construction program and quality system to VicRoads;
- > in all cases where the construction techniques proposed are beyond the scope of the current risk assessment;
- > during construction, where events occurring on site require an identified risk to be reviewed; and
- > as required by VicRoads procedures.

C.3.4.2 CONTRACTOR ENVIRONMENTAL MANAGEMENT STRATEGY (CEMS)

Assuming that the project will be undertaken on a Design and Construct basis, the Contractor will be largely responsible for determining the detailed program of works and the specific construction techniques to be used. Contractors are therefore required to submit a Contractor Environmental Management Strategy (CEMS).

The CEMS is the Contractor's overview for the management of the environment during all phases of the works. The CEMS is the overarching parent document from which more detailed environmental management plans (CEMPs) are prepared based on construction and site staging. The CEMS becomes the reference document that ensures the commitments for environmental protection and management as identified in this Planning Assessment Report (PAR) and the contract specification clauses are appropriately implemented on the ground. It also serves as a mechanism for confirming the accuracy of the impacts detailed in the PAR and measuring the effectiveness of the mitigation measures.

Specifically, the CEMS would be expected to include:

- > The purpose and objectives of the environmental management strategy for the Contract works.
- > A schedule of environmental elements that are potentially affected by the works including an outline of proposed mitigation treatments and proposed timeframes.
- > Processes and responsibilities for:
 - reviewing and updating the CEMS;
 - the development, implementation and maintenance of CEMPs;
 - independent verification and auditing of the CEMPs;
 - reporting and investigation of environmental incidents or complaints relating to any environmental issue;
 - contingency plans, response measures and other relevant details such as Occupational Health and Safety considerations for environmental incidents, including after hours response; and
 - an adaptive approach for the review and update of the Environmental Management Plan(s) as works progress and/or following non-conformances, complaints or previously unidentified issues.
- > Requirements of all relevant statutory authorities including necessary approvals, permits and licenses.
- > Arrangements for site induction and training to ensure that all relevant personnel are aware of the requirements of the CEMS and the requirements of specific CEMPs.
- > Arrangements to ensure that all subcontractors comply with the requirements of the CEMS and the requirements of specific CEMPs.
- > Arrangements for surveillance and auditing of the works.
- > A supervision protocol involving areas of responsibility for the Contractor's personnel, personnel from public authorities and stakeholders.
- > Any project specific requirements that may be required including those resulting from this PAR process.

C.3.4.3 CONTRACTOR ENVIRONMENTAL MANAGEMENT PLANS (CEMPs)

Prior to commencement of construction on site, CEMPs containing specific details on proposals for the environmental management of individual stages of construction for particular areas of the site, will be prepared.

The Contractor will prepare CEMPs for the management of construction activities that impact on the environment in accordance with its CEMS.

The CEMPs will address the impacts on elements of the environment including:

- > Water quality and soil erosion management;
- > Groundwater Quality;
- > Air Quality (in particular dust management);
- > Access and Traffic;
- > Construction Materials;
- > Contaminated Soils and Materials;
- > Waste Management;
- > Fuels and Chemicals;
- > Noise and Vibration;
- > Flora and Fauna (including weed management); and
- > Cultural Heritage.

Each CEMP will be expected to be a complete document and incorporate the following:

- > An introduction describing the CEMP, its purpose and justification for the proposed treatment.
- > An overall risk identification/management plan for all work on the site, including when the Contractor is not on site.
- > Scaled drawings that clearly show the proposed and actual locations and environmental controls (including restricted access areas) together with the measures to adequately control and monitor the environment.
- > Timing for implementing and assessing environmental controls and also for proactive reviews. (For example, prior to rain events, change in construction program).
- > Duration of activity/risk and of the associated environmental controls.
- > Records detailing the timing for and implementation of the environmental controls.

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- > Procedures, measures, processes and checklists to demonstrate how performance requirements are managed (ie. design, implementation, monitoring for effectiveness and corrective action).
 - > Frequency of inspection and maintenance of controls.
 - > Modifications proposed to existing environmental control devices, and effects on permanent works.
 - > Provision for access to environmental controls in all weather conditions.
 - > Approvals and/or agreements and/or licences to meet requirements of relevant authorities.
 - > Procedures to ensure the works are designed in such a manner as to avoid environmentally sensitive areas identified and unnecessary vegetation removal.
 - > Verification, including supporting information, that each specification clause/ impact has been addressed within the CEMP.
 - > Emergency response plans and immediate measures to be adopted/ implemented in the event of an environmental incident, ie. breach of performance requirements, or failure of (environmental) control measures to protect both the construction site and other areas from damage and reporting to authorities.
 - > Timeframes of when temporary control measures no longer required are to be removed or when revegetation has established on formerly exposed areas.
 - > Details of how control measures shall be removed from the site and disposed of without damaging the established environment.
 - > Any project specific requirements that may be required, including those resulting from the EES process.

C.3.4.4 REVIEW OF CONTRACTOR'S ENVIRONMENTAL MANAGEMENT STRATEGY AND ENVIRONMENTAL MANAGEMENT PLANS

The contractor will be required to organise the review of their final CEMS and CEMPs against the PAR and contract specifications by an independent environmental specialist prior to submission to VicRoads.

Once VicRoads is confident that the CEMS and site specific CEMPs meet the requirements of the contract specifications, VicRoads will confirm implementation of the CEMP on site and then, if appropriate, release the “hold point” in the contract specification for construction to commence. Only then is the Contractor able to commence work on the site within the area defined by the particular CEMP.

Relevant stakeholders such as Department of Sustainability and Environment, Melbourne Water, Port Phillip and Westernport Catchment Management Authority and the Environment Protection Authority will be provided an opportunity to review and provide comment on the CEMS.

C.3.4.5 CONSTRUCTION MONITORING

This consists of surveillance and auditing of the works as well as the collection and review of sample data. Construction monitoring ensures that the Contractor has implemented effective environmental protection measures and is conducting works in accordance with their approved CEMPs and the contract specification.

Both VicRoads and its Contractors will conduct regular surveillance and auditing of the works. Details of Contractor surveillance and auditing procedures and schedules will be contained in the Contractor's CEMS and CEMPs. VicRoads will undertake construction monitoring in accordance with the VicRoads Surveillance & Audit Plan.

Surveillance and audit is conducted by VicRoads Engineers, VicRoads Surveillance Officers who are present onsite on a full time basis, and Contractor staff including dedicated Environmental Officer/s. Site inspections utilising VicRoads and Contractor checklists will be undertaken jointly with VicRoads and the Contractor on a fortnightly basis. CCMA and the EPA will be extended an invitation to attend monthly inspections.

Surveillance activities are recorded in the VicRoads Surveillance & Management System Database to provide verifiable evidence of Contractor compliance with specification requirements.

In addition to the regular monitoring and maintenance of environment protection measures identified in the CEMP, the Contractor will be required to ensure that independent audits of its CEMS and CEMPs are undertaken at regular intervals by an Independent Environmental Auditor.

Independent environmental audits will be required to be undertaken by a prequalified person or an environmental management specialist in accordance with ISO 19011. A specialist in the employ of the Contractor will not be acceptable for this purpose. The Independent Environmental Auditor shall be completely free of any other commitment or obligation to the Contractor or consultant carrying out the design for the Contract.

C.3.4.6 PERFORMANCE REPORTING

Contractor performance is assessed and reported on a monthly basis in the form of written reports and site meetings. Non-conformances and corrective actions are managed in accordance with VicRoads Contract Management System and the contract specification to ensure remedial measures are implemented within appropriate timeframes.

Contractor Prequalification Performance Reports are prepared by VicRoads on a regular basis. These reports require assessment of the Contractors overall environmental performance and may be used in the review of prequalification levels which directly influence future work opportunities with VicRoads.

C.4 RESPONSIBILITIES

C.4.1 VICROADS RESPONSIBILITIES

Responsibility and authority in relation to environmental management will be in accordance with the VicRoads Environmental Management Toolkit. Responsibilities are described below.

C.4.1.1 PROJECT DIRECTOR

Ensures that the PEPS document is developed and implemented according to the VicRoads' Quality System and Procedures.

C.4.1.2 MANAGER PROJECT DELIVERY

Implements and monitors the performance requirements of the PEPS document and contract documents, and ensures that these are updated as required.

Ensures all relevant staff are familiar with the PEPS and have received appropriate training and induction for awareness and compliance in relation to environmental issues.

Ensures that the requirements of the PEPS document are incorporated into the Contract Specifications.

Monitors effectiveness of the Surveillance & Audit Plan.

C.4.1.3 TEAM LEADER PROJECT DELIVERY

Incorporates the requirements of the PEPS document into the Contract Specifications.

Provides the Contractor with copies of appropriate environmental reports and documents to ensure a complete risk analysis is undertaken by the Contractor.

Reviews the CEMS and CEMP's to check that all of the specification requirements have been adequately addressed.

Ensures the Contractor's construction procedures, work instructions and Inspection and Test Plans are reviewed.

Develops a risk based Surveillance & Audit Plan for each Contract.

Ensures surveillance of the works is undertaken in accordance with the Surveillance and Audit Plan.

Monitors and ensures compliance with VicRoads procedures.

C.4.1.3 PROJECT DELIVERY ENGINEER/ SURVEILLANCE MANAGER

Conducts day to day surveillance of the contract in accordance with the Surveillance & Audit Plan, including release of hold points in accordance with the specification. (Hold points are where the Contractor cannot proceed until a key action has been signed off by VicRoads.)

Monitors the CEMP's to ensure ongoing implementation and effectiveness of the approved plans.

Reviews the Contractor's construction procedures, work instructions and Inspection and Test Plans.

Upon Team Leader advice, logs environmental and archaeological incidents in VicRoads' Environmental (Incident/News) database.

C.4.1.5 BUSINESS MANAGER

Monitors the performance and operation of the PEPS document, action plan and management system.

Prepares monthly reports in accordance with the requirements of this document.

Issues monthly reports to all holders of this document and tables at the community liaison group meetings.

Manages and maintains the Project's risk management system.

Manages and conducts auditing of VicRoads systems and procedures.

C.4.2 CONTRACTOR RESPONSIBILITIES

The following items will be the responsibility of the Contractor to:

Develop and implementation of Contractor Environmental Management Strategy and Plans.

Comply with principles of relevant State Environment Protection Policies (SEPP's) and environmental legislation.

Obtain any necessary permits/approvals for construction activities and site offices.

Monitor, audit (including independent auditing) and conduct surveillance of the works in accordance with CEMP's.

Report on the effectiveness of the CEMP's and update them as necessary.

Respond to and communicate significant environmental incidents immediately to VicRoads and relevant regulatory authorities.

C.5 INDUCTION AND TRAINING

All VicRoads staff and Contractors working on Section 3 of the OMR/E6 Transport Corridor will be fully informed of the objectives and requirements of the PEPS and their specific environmental protection obligations.

VicRoads and its Contractors will:

- > Conduct a joint VicRoads - Contractor environmental management training workshop, following contract award, to raise awareness of the specific environmental management requirements and practices of the PAR.
- > Ensure inductions covering safety and environment are undertaken for all Contractors staff and VicRoads personnel prior to commencement on site, including all subcontractors.
- > Ensure that construction personnel are briefed about potential environmental issues and environmental management responsibilities and practices.
- > VicRoads recognises the need for ongoing environmental awareness and management training. As a result, VicRoads reviews training needs on a six monthly basis through staff development plans and encourages attendance at both internal and external environmental training courses on a regular basis or whenever a need is identified.

C.6 CONSULTATION

C.6.1 COMMUNITY

VicRoads is committed to community consultation.

During the planning phase VicRoads has informed the general public via an initial media release in 2007 and ongoing updates via VicRoads web site, emails, phone calls and individual stakeholder consultations.

A Technical Reference Group (TRG) was established to contribute to the development of the project. VicRoads has consulted with officers from the Department of Transport, Department of Sustainability and Environment, Department of Planning and Community Development, Department of Primary Industries, Department of Justice, Growth Areas Authority, DIIRD, Aboriginal Affairs Victoria and Heritage Victoria. Discussions have also taken place with some utilities.

Consultation has also occurred with the 7 municipalities (Hume City Council, Whittlesea City Council, Mitchell Shire Council, Wyndham City Council, Melton Shire Council and City of Greater Geelong) through which the OMR/E6 Transport Corridor passes.

Broad guidelines for effective community consultation and participation are detailed in the VicRoads publication, Community Participation Strategies and Guidelines (May 1997). During the preconstruction and construction phases, a project specific Communications Plan will also be developed and implemented to ensure ongoing and responsive two way communication with the local community and key stakeholders.

To enable the environmental safeguards and monitoring outlined in this PAR to be reviewed and refined with continuing community input, a Community Liaison Group (CLG) will be established to provide a high standard of openness, transparency and accountability during the construction phase. Members of the Community Liaison Group may include:

- > Local Residents
- > Local Business and Community Groups
- > Environment Protection Authority
- > Department of Sustainability and Environment
- > Melbourne Water
- > Port Phillip and Westernport Catchment Management Authority
- > Cities of Brimbank, Greater Geelong, Hume, Whittlesea and Wyndham and Shires of Melton and Mitchell
- > Other interested parties and stakeholders.

C.6.2 GOVERNMENT AUTHORITIES

During all phases of the Project, VicRoads will be responsible for ensuring that the requirements of government authorities are satisfied. This includes the granting of permits and approvals and the setting of requirements for the various phases of the design, development and operational phases.

The process for achieving this will be through regular liaison between officers of the relevant authorities.

Regular liaison meetings have or will be established with the following key authorities:

Melbourne Water - Authority responsible for natural waterways and catchments including approvals relating to stormwater discharge into streams and overland hydrology.

Department of Sustainability and Environment - Authority responsible for issues relating to flora and fauna including the granting of permits to disturb flora and fauna listed in the *Flora and Fauna Guarantee Act 1988*.

Environment Protection Authority – Regulatory Authority responsible for ensuring that the State Environmental Protection Policies are adhered to.

Heritage Victoria - Authority responsible for issues relating to the post European cultural heritage issue including the granting of permits to disturb sites listed on the Victorian Heritage Register.

Aboriginal Affairs Victoria - Aboriginal Affairs Victoria is the Victorian Government's key agency for advice on Aboriginal affairs. It promotes knowledge and understanding about Victoria's Aboriginal people within the wider community, and also administers legislation that protects Aboriginal cultural heritage including the *Aboriginal Heritage Act 2006* that commenced operation on the 28 May 2007 and provides for the protection and management of Victoria's Aboriginal heritage with streamlined processes linked to the Victorian planning system.

Cities of Brimbank, Greater Geelong, Hume, Whittlesea and Wyndham and Shires of Melton and Mitchell - Responsible authorities for all issues involving local government including the issue of permits required by relevant planning schemes.

C.7 ENVIRONMENTAL LEGISLATION

In addition to commitments made in this PAR document, VicRoads and its Contractors must conduct their activities at all times in accordance with the relevant legislation.

C.8 ENVIRONMENTAL RISK ASSESSMENT AND MITIGATION

C.8.1 GENERAL

Risk management is a fundamental principle that is integrated into VicRoads everyday work practices and corporate procedures. Risk management is an ongoing process consisting of well defined steps which, when taken in sequence, support better, more informed decision making by contributing to a greater insight and understanding of a wider range of events, their likelihood of occurrence and their consequence for VicRoads, its customers and the environment. It is as much about identifying opportunities for continuous improvement, as it is about avoiding losses.

Risk management ultimately aims to achieve improved outcomes and ensure compliance with statutory obligations. A framework for risk management is outlined in VicRoads Risk Management Guidelines (November 2003).

A key requirement of VicRoads Environmental Management Guidelines (2006) is also to ensure any potential environmental impacts and risks are proactively identified, addressed and managed to achieve a successful outcome. Risk management is therefore an important component of this PAR document.

C.8.2 RISK MANAGEMENT SYSTEM AND PROGRAM

The Risk Management Database is an electronic system used by VicRoads staff during the planning and preconstruction phases of the project, to register identified risks and track and assign mitigation actions and responsibilities. By tracking and assigning actions and responsibilities for identified risks, the system provides an effective and proactive management tool for the monitoring and ongoing management of the potential environmental risks identified. The system includes automatic email reminders for assigned actions and reviews.

The detailed risk assessment will be conducted prior to finalisation of the specification and tender advertising. This is required to ensure planned actions to treat previously identified risks at the PAR stage (documented in Section C.10) have been addressed within the specification and that any new risks are identified and appropriate treatments incorporated into the specification.

Following contract award, VicRoads will prepare a detailed operational level risk assessment based on the Contractor's proposed program of works and construction techniques. This risk assessment, built on the preceding risk assessments, will be used in the development of the Surveillance & Audit Plan. The Surveillance & Audit Plan will detail frequency, responsibilities and level or intensity of surveillance appropriate for the construction activity leading to the identified risk.

Surveillance activities undertaken in accordance with the Surveillance & Audit Plan will be recorded in the VicRoads Surveillance & Management System Database to provide verifiable evidence of contractor compliance.

Combined with strict specification requirements for contractor management and independent auditing of environmental controls, these systems and processes will clearly define and document an audit trail that demonstrates due diligence in the management and monitoring of environmental responsibilities and requirements.

C.8.3 SPECIALIST CONSULTANTS' RISK ASSESSMENTS AND RECOMMENDATIONS

Table C-1 detail the potential risks identified and mitigation recommendations made for each environmental category. VicRoads response to these recommendations and VicRoads management measures to minimise environmental impacts have been detailed in Section C.10.

C.8.4 VICROADS RISK AND MITIGATION MEASURES SUMMARY

To ensure that relevant environmental issues, risks and opportunities are identified and that appropriate strategies and actions will be implemented to manage and minimise the environmental impacts of the Outer Metropolitan Ring / E6 Transport Corridor, an initial environmental risk identification has been conducted.

A list of expected construction activities to be undertaken by VicRoads and/or VicRoads' Contractors has been detailed and for each activity, potential impacts on the environment have been identified using the findings of the specialist investigations, relevant legislation, VicRoads' past experience and input from stakeholders.

Risk treatment or mitigation actions (including monitoring measures) to be applied during the planning and preconstruction phases and incorporated into the Contract Specification, were then developed for the identified risks. These actions are summarised in the Management Measures Section.

The risk identification also allows prioritisation of identified risks to ensure the appropriate level of construction surveillance and audit is applied during construction.

C.9 PROJECT MONITORING AND REPORTING

C.9.1 VICROADS MONITORING AND REPORTING

VicRoads will monitor the works during construction in accordance with the Environmental Management Framework described throughout this chapter.

VicRoads will prepare regular reports throughout the construction phase of the project. These reports will be distributed to the Community Liaison Group. This report may include:

1. A summary of works and environmental measures undertaken during the reporting period.
2. A statement of the effectiveness of the measures implemented with reference to VicRoads stated objectives and the action taken to improve their effectiveness, where necessary. The results of the water quality monitoring program will be updated.
3. A summary of any environmental incidents that occurred during the period and how they were addressed to prevent recurrence.
4. A summary of environmental audits/surveillance conducted during the period, by VicRoads, including a risk management update.
5. A summary of any changes made to this document and reason for the change.
6. A summary of the Contractor's performance including the independent auditor's report and Contractor's monitoring results.

C.9.2 CONTRACTORS MONITORING AND REPORTING

The Contractor shall undertake routine surveillance and regular independent auditing of the implementation, maintenance and effectiveness of its CEMPs.

Ongoing specialist monitoring of water quality, during construction, will be undertaken by the Contractor for all water runoff from the site as well as waterways impacted by the works. Likewise, air quality in respect to dust will be continually monitored at permanent monitoring stations along the site. Monitoring requirements of other aspects of the environment such as cultural heritage and flora and fauna is detailed in Section C.10.

The Contractor shall provide a report each month on performance and effectiveness of its CEMPs, along with copies of audit reports and checklists where appropriate.

C.9.3 ENVIRONMENTAL INCIDENT MANAGEMENT

All Environmental incidents will be logged in the VicRoads Environmental Information System database.

This system has been designed to ensure prompt, accurate reporting of incidents to the responsible authorities, including EPA, Heritage Victoria, Aboriginal Affairs Victoria and relevant emergency services. It also ensures that the incident is addressed and passed on to others to learn from. The system provides a record of all incident reports, describes each incident and remedial action/s taken by the Contractor and VicRoads. These incident reports are then assessed, to determine whether the Contractor and VicRoads responded to the incident adequately. This assessment will identify whether there are deficiencies in either the Contractors' or VicRoads' Environmental Management Systems or procedures.

An environmental incident is defined as any incident occurring that has caused, or has the potential to cause significant pollution or damage to the natural or cultural environment. Major emergencies on site will be addressed in accordance with VicRoads Emergency Response Plan.

In the event that an unforeseen discovery or issue such as the identification of threatened/endangered flora and fauna, discovery of human remains or excavation of contaminated materials, is experienced during the construction of the OMR/E6 Transport Corridor, the following process will be adopted:

1. All works in the immediate vicinity of the site will cease.
2. The Contractor will advise VicRoads of the issue
3. Relevant authorities to be advised immediately:
 - Flora & Fauna – DSE Flora and Fauna Department
 - Indigenous Cultural Heritage - Heritage Services Branch of Aboriginal Affairs Victoria and Registered Aboriginal Parties
 - Non-indigenous Cultural Heritage – Heritage Victoria
 - Soil and/or Water Contamination – EPA
4. Investigations into the nature, cause and effect of the issue will be undertaken as necessary.
5. Consultation with Councils, DSE and any other relevant authority in regard the need for any further permits or requirements.
6. Mitigation measures will be implemented if required.
7. Update of PAR and CEMP's as necessary.

C.10 MANAGEMENT MEASURES

Table C-1 below details the management measures which will be undertaken by VicRoads to ensure that the environmental impacts of the proposed project are minimised.

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
1. Flooding	1.1 Design	<p>Finalise the design of culverts, retarding basins, bridges and embankments to minimise adverse impacts on flood behaviour, local scour and removal of riparian vegetation. This includes locating the bridge piers outside the main waterway area.</p> <p>In addition:</p> <ul style="list-style-type: none"> - Provide a minimum of 300mm freeboard at bridge structures. - Design all major structures for the 100 yr ARI storm event with appropriate afflux based on planned drainage schemes. - Design all minor structures (such as culverts) at minor watercourses for the 100 yr ARI storm event. - Generally the freeway formation will not be higher than the 100 yr ARI flood level in flood prone areas, other than at localised areas such as interchanges. - Careful placement and design of structures to ensure that existing flows are delivered across/through the freeway reservation in a way that is compatible with existing CoGG drainage catchments.
	1.2 Pre-Construction	<p>Discuss with private landowners and authorities to establish agreed flood levels. These discussions will include VicRoads, Melbourne Water, Councils and landowners.</p> <p>Provision of grassed swales to help reduce any increase in pollutants in the run off from the OMR/E6 Transport Corridor.</p> <p>Ensure road design maintains drainage of overland flows and, where practicable, allows for them to pass below the road to be dispersed back across natural flow path without mixing with road run-off.</p> <p>Ensure dry extended detention basins are not sited in locations that will interfere with or be affected by flooding (at the appropriate ARI).</p>
	1.3 Construction	<p>Establish work compounds outside the designated floodplains and overland flood paths.</p> <p>Plant equipment will not be left in rivers, creeks or floodplains.</p> <p>Minimise earthworks that alter the existing floodplain and surface hydrology.</p>
	1.4 Post-Construction	<p>Undertake regular monitoring and maintenance of structures. Update Planning Scheme in relation to flood overlays if required.</p>

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
<p>2. Damage to native flora & habitat areas including spreading of noxious weeds and pests.</p>	2.1 Design	<p>Minimise the width of the road footprint where the road impinges on areas of native vegetation, as far as feasible.</p> <p>Indigenous species to be used in landscaping design and works.</p>
	2.2 Pre-Construction	<p>Preserve vegetation along steep areas and buffer areas along drainage lines and waterways where possible.</p> <p>Adhere to principles of Victoria’s Native Vegetation Management – A Framework for Action.</p> <p>Conduct a detailed Net Gain Assessment.</p> <p>Obtain Vegetation Removal Permits from relevant Councils.</p> <p>Develop offset measures and sites in consultation with DSE and other relevant authorities including the use of indigenous plants for revegetation. Offsets sites to consider opportunities for integration with Council and community areas. The proposal would include treatments to provide replacement or better managed habitat to replace the vegetation cleared as part of the construction process, within the framework provided by an overall approach to habitat management associated with the revision of Melbourne’s Urban Growth Boundary,</p> <p>Develop appropriate management strategy for offset works.</p> <p>Fence the transport corridor reserve to prevent stock access to the watercourses, significant vegetation and habitat areas within the reservation boundaries.</p> <p>Disturbance to areas outside road reservation to be avoided as far as possible. Fence the freeway reserve to avoid disturbance to offsite flora. VicRoads will protect areas of high-local significance vegetation from a distance of 10 m from the toe of the permanent freeway batter to the freeway Right of Way. VicRoads will also endeavour to minimise impacts on areas of local significance in non essential construction areas, where practicable as deemed by VicRoads.</p> <p>Where possible retain and protect scattered non-indigenous mature trees.</p> <p>Implement program of indigenous seed collection and plant propagation material as soon as possible. Material to be used as part of revegetation works. Seed collection to include local seed if available.</p>
	2.2 Pre-Construction	<p>Develop weed management strategy in consultation with DSE.</p> <p>Consult with the Field Naturalists Club of Victoria to determine if additional sighting records for area (not currently on AVW or FIS) are available.</p>

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
<p>2. Damage to native flora, fauna & habitat areas including spreading of noxious weeds and pests. (continued)</p>	<p>2.3 Construction</p>	<p>Contractors will prepare a Contractor Environmental Management Strategy (CEMS) and Plans (CEMPs) prior to works commencing. These will be reviewed by VicRoads and will include requirements such as:</p> <ul style="list-style-type: none"> - Minimise disturbance or impact to any nominated flora and fauna sites/habitats/communities/species. - No plant, equipment, materials and debris is to be located in areas within the limit of the canopies. - No vegetation other than that necessary to construct the specified works to be removed. - No introduction of weed and fungal infestation to flora and fauna. - No injury to fauna. - Hygiene of vehicles to be maintained. - Procedures addressing habitat removal, seed collection, fauna and nests. - Induction protocols for construction workers with respect to required practices to protect flora and fauna. - Protocols to be established if fauna or cultural heritage sites are discovered during construction. Generally this will involve cessation of works in that area and immediate contact with the responsible authority. Fauna is to be captured and relocated by appropriately trained personnel. - Access arrangements such as defining designated access routes. <p>Prior to commencing work, Contractors will:</p> <ul style="list-style-type: none"> - Fence any significant vegetation areas to be protected with sturdy, visible fencing and signs. - Arrange for a qualified zoologist/botanist to inspect rocky outcrops, hollow bearing trees, mature trees, frog habitat and other vegetation for wildlife, prior to removal. - Arrange a joint inspection with VicRoads to demonstrate that areas and trees to be retained are adequately protected (i.e. fenced) and signed/tagged to prevent accidental damage. - Obtain VicRoads approval to commence works subject to the above being satisfied. For vegetation cleared of habitat restrictions and identified for removal, VicRoads will require the following: <ul style="list-style-type: none"> - Place removed trees and relocated rocks (basalt floaters) on the ground to provide ground-level habitat where feasible. This will only occur where native ground-level vegetation is unlikely to be disturbed, or where it does not impede floodplain flows. - Maximise mulching and stockpiling of indigenous vegetative material removed (this does not include selected tree trunks to be retained for wildlife habitat). - Maximise harvesting the remaining indigenous vegetative material (particularly aerial parts of trees); and - Trees that require removal will only be grubbed where necessary for the execution of the Works, otherwise trees will be cut down close to existing ground level with roots left in-situ to maintain ground stability. The stumps of non-native ornamental trees will be ground out using a stump grinding machine. <p>Where possible retain logs e.g. habitat logs and removed trees as additional fauna habitat otherwise mulched for landscaping.</p>
<p>2. Damage to native flora, fauna & habitat areas including spreading of noxious weeds and pests. (continued)</p>	<p>2.3 Construction (continued)</p>	<p>The use of construction vehicles to be restricted to defined access routes and turning areas, as detailed on scaled construction Environment Management Plans.</p> <p>Regular plant wash downs to limit spread of weeds in designated wash down areas.</p> <p>Minimise the width of the area to be cleared or otherwise disturbed keeping construction earthworks, machinery traffic and other disturbances within the final formation wherever possible.</p>
	<p>2.4 Post Construction</p>	<p>Maintain landscaping works in accordance with the Landscape Plans, particularly in relation to weed control, for at least 2 years after construction.</p>

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
3 Damage to flora and fauna by fragmentation of habitat	3.1 Design	Finalise the design of bridges to ensure that any barrier effects to the movement of invertebrates, fish and aquatic mammals are minimised through the appropriate placement of piers and restriction of the construction footprint. Minimise impact on riparian vegetation and limit removal of hollow bearing trees.
	3.2 Pre-Construction	Consider planting indigenous shade tolerant species under bridges to reduce barrier effects and incorporate this planting into landscape plans, where feasible.
	3.3 Construction	Develop and implement CEMPs which addresses fencing and reuse of removed trees. Retain and protect existing native vegetation beside creek crossings where possible. Make substrates beneath the bridges as natural as possible (eg. rocks, logs). Provide flat areas that are dry or have shallow water levels (during normal flows) beneath the bridges to encourage fauna movements. Create suitable habitat for ground fauna at culverts to facilitate movements.
	3.4 Post Construction	Replant as soon as possible where vegetation is removed.
4 Damage to aquatic fauna and habitat (on and offsite)	4.1 Design	Ensure that pollutant loads from the OMR/E6 Transport Corridor are modelled to make sure that pollutant reduction targets can be achieved in accordance with the relevant targets set out in the Urban Stormwater - Best Practice Management Guidelines (Victorian Stormwater Committee, 1999) and Council stormwater quality management plans. Design and implement best practice water sensitive urban design (WSUD) treatments for freeway stormwater runoff. Minimise the amount of instream habitat clearance. Avoid placement of bridge piers within rivers and creeks Restrict disturbance to terrestrial vegetation to a minimum to reduce the likely effects on aquatic fauna. Design creek crossings to minimise in stream effects. Design of all river and creek-bed structures and any temporary fish passage devices must take into account hydraulic flow data over a number of years.
	4.2 Pre-Construction	Fence the freeway reserve to prevent any stock access to the watercourses within the reservation boundaries.

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
4 Damage to aquatic fauna and habitat (on and offsite) (continued)	4.3 Construction	<p>Develop a CEMP in the vicinity of rivers and creeks including appropriate erosion and sediment controls to prevent loss of sediment and pollutants from the construction zone.</p> <p>The CEMP will include procedures relating to bituminous work involving priming, sealing and painting activities.</p> <p>Carefully manage and supervise use of herbicides to avoid damage to non-target organisms.</p> <p>Select herbicides that have minimal effects on aquatic fauna.</p> <p>Minimise sedimentation by installing sediment and soil erosion control measures prior to the commencement of all works.</p> <p>Do not undertake any temporary works within watercourses unless absolutely necessary and then only with consent of the CCMA.</p> <p>Undertake water quality monitoring to determine if erosion and sediment controls are effective. Any deficiencies will be rectified immediately to ensure that the water quality objectives of the relevant legislation are achieved.</p> <p>Implement control and treatment of roadside drainage to minimise litter, sediment, weed seeds and chemical pollutants from reaching existing wetlands and watercourses.</p> <p>Dispose of all concrete washings in a nominated location (to be detailed in the CEMP) and remove these from site to prevent accidental discharge to watercourses.</p> <p>Require evidence from the Contractor to demonstrate that all permanent and temporary sedimentation basins have been properly designed (hydraulically and structurally) to ensure failures do not occur.</p> <p>Clean out permanent and temporary sedimentation basins when the accumulated sediments reduces the capacity of the basin by 30% (or more) or wherever the sediment is less than 500mm below the spillway crest (whichever occurs earlier).</p>
	4.4 Post Construction	<p>Only remove sediment and erosion controls once landscaping has established.</p> <p>Investigate options for rehabilitation of affected waterways.</p>
5 Damage to flora and fauna by road kill	5.1 Design	<p>Bridge rivers and creeks to minimise risk on local fauna road kills.</p> <p>Finalise design of fencing in areas of native vegetation. Where possible, this design should encourage movement of animals under the road at creek crossings and deter birds from flying across roadways at traffic height.</p>
	5.2 Pre-Construction	<p>Fence appropriate sections prior to the commencement of works to encourage fauna to use future corridors.</p>
	5.3 Construction	<p>Revegetate any fenced sections that have been cleared on both sides of the OMR/E6 Transport Corridor.</p>
6 Damage to new landscaped flora including spreading of noxious weeds and pest	6.1 Design	<p>Use local indigenous species in landscaping and revegetation works to maximise likelihood of establishment.</p>
	6.2 Pre-Construction	<p>Collect native plant species seeds from the vicinity of the OMR/E6 Transport Corridor for propagation and use in landscaping.</p>
	6.3 Construction	<p>Undertake revegetation/landscaping to take place in accordance with the landscape plans and agreed offset requirements previously identified.</p> <p>Apply best practice landscaping for planting and maintenance.</p> <p>Use wash down sites to minimise spread of noxious weeds and pests.</p>
	6.4 Post Construction	<p>Spray weed growth within revegetation areas with an appropriate herbicide over a three-year period (as necessary) taking care to avoid damage to native species.</p> <p>Monitor weed management measures for at least three years after construction to allow initial and follow-up control of weed populations that establish following construction.</p>

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
7 Damage to Aboriginal cultural heritage	7.1 Design	Ensure engineering design limits the extent of impact on sites or areas of high archaeological potential.
	7.2 Pre-Construction	<p>In conjunction with the relevant Registered Aboriginal Parties, implement protocols set out in the approved Cultural Heritage Management Plan for managing and monitoring Aboriginal cultural heritage issues during construction. This will include implementing approved protocols for undertaking subsurface testing for areas within 100 m of rivers and creeks and disturbance of designated sites.</p> <p>Undertake sub surface investigations in areas of high archaeological potential.</p> <p>Implement protocols set out in the approved Cultural Heritage Management Plan (CHMP) where it may be necessary to disturb and or destroy sites.</p>
	7.3 Construction	<p>Implement relevant components of approved Cultural Heritage Management Plan. Arrange for an onsite presence as agreed with relevant Registered Aboriginal Parties when works in the vicinity of sensitive sites are undertaken.</p> <p>Develop and implement appropriate procedures for managing cultural heritage issues during construction (for relevant VicRoads staff and Contractors) in accordance with the VicRoads Cultural Heritage Guidelines 2007.</p> <p>Develop and implement CEMPs including:</p> <ul style="list-style-type: none"> - Identification and protection of all identified heritage sites and areas of significance that are not to be disturbed or destroyed. - Induction training to ensure all onsite staff are aware of their obligations. - Procedures for undertaking daily monitoring of the protective measures and the condition of the cultural heritage sites when construction activities are occurring in the vicinity of sensitive sites. - Monitor all surface excavations as per CHMP. - Establish procedures for the uncovering of unknown cultural heritage site or artefacts during construction.
8 Damage to European heritage sites	8.1 Pre -Construction	<p>Visual impacts on heritage sites not directly affected to be in accordance with the requirements of the Department of Environment and Heritage and Heritage Victoria where relevant to the status of the site.</p> <p>Obtain necessary permits and requirements from Heritage Victoria, and local Council where necessary, to destroy or partially disturb sites.</p>
	8.2 Construction	<p>Develop and implement appropriate procedures for managing cultural heritage issues during construction (for relevant VicRoads staff and Contractors) in accordance with the VicRoads Cultural Heritage Guidelines 2007.</p> <p>Develop and implement CEMPs including:</p> <ul style="list-style-type: none"> - Identification and protection of all identified heritage sites and areas of significance that are not to be disturbed or destroyed. - Induction training to ensure all onsite staff are aware of their obligations.

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
9 Reduction of water quality from sediment and toxicant runoff from the site and roads	9.1 Design	<p>Model pollutant loads from OMR/E6 TC to ensure pollutant reduction targets can be achieved in accordance with the relevant targets in the Urban Stormwater – Best Practice Management Guidelines (Victorian Stormwater Committee, 1999).</p> <p>Ensure engineering design follows the most direct route possible for the adopted alignment, consistent with the objective of minimising disturbance and vegetation clearance for the crossing of rivers, creeks and drainage lines.</p> <p>Ensure the design of culverts and bridges avoids barrier effects to the movement of invertebrates/ fish. This requires that flow velocities are not significantly increased to levels that prevent upstream movement and no vertical drops are created that prevent upstream movement.</p>
	9.2 Pre-Construction	<p>Undertake water quality sampling to establish background water quality for rivers and creeks.</p> <p>Construction timetable to avoid undertaking works in the vicinity of waterways during periods of high annual rainfall (where feasible).</p>
	9.3 Construction	<p>The following actions will be implemented to minimise the impacts of construction on water quality:</p> <p>Develop and implement CEMPs including appropriate erosion and sediment controls to prevent loss of sediment and pollutants from the construction zone. These plans may include:</p> <ul style="list-style-type: none"> - Management of stockpiles to ensure they do not interfere with drainage paths. - Appropriate clearances from watercourses and identification of where stockpiles will be least susceptible to wind erosion. - Appropriate treatment of stockpiles, with seeding or alternative coating, to prevent erosion if stockpiles are to be in place for longer than 28 days. - Staged stripping and revegetation of exposed areas to minimise exposure periods. - Installation of catch drains to direct water through erosion controls prior to discharge. - Maintenance of removed vegetation root systems for as long as feasible to reduce potential for erosion. - Locate material stockpiles, construction buildings, sediment dams, drains, other infrastructure and access roads within cleared land where possible. - Installation of sediment and erosion controls such as interception and settling basins, chemical treatments, sediment filters such as geotextile fences, straw bails, rock beaching. - Prompt rehabilitation of cleared areas. <p>The CEMP will be required to implement appropriate measures identified in:</p> <ul style="list-style-type: none"> - EPA Publication 275 - Construction Techniques for Sediment Pollution Control - EPA Publication 480 - Environmental Guidelines for Major Construction Sites <p>The Contractor will monitor and maintain the site controls at a frequency of:</p> <ul style="list-style-type: none"> - not more than 7 days; - within one hour of the commencement of any significant runoff resulting from rain events during working hours; - every four hours during periods of sustained rain events during working hours; and - within 12 hours of a rain event outside working hours.

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
9. Reduction of water quality from sediment and toxicant runoff from the site and roads (continued)	9.3 Construction (continued)	<p>Any defects revealed by such inspections will be rectified immediately and these works will be cleaned, repaired and augmented as required to ensure effective control thereafter.</p> <p>Implement an ongoing water quality monitoring program for the duration of the construction phase of the project.</p> <p>Induct construction workers with respect to required practices to protect surface water quality.</p> <p>Minimise area of disturbance and period of exposure.</p> <p>Install litter fences and large bins with lids where necessary.</p> <p>Supply and use (as required) spill containment kits. Spill kit to be located permanently at major river and creek crossings.</p> <p>Construct bunds to contain water used in dust suppression and around areas where runoff could transport sediment or chemicals into the waterway.</p> <p>Mix concrete and cement used in construction of the OMR/E6 TC away from nearby waterways and drainage lines.</p> <p>Where mulching is required, use locally-sourced, aged or exposed mulch where possible.</p> <p>Provide facilities to prevent egress of sediment from site (for example truck washdown or rumble grids).</p> <p>Implement dust suppression procedures such as watering.</p> <p>Cover or seed stockpiles of material.</p> <p>Avoid stockpiling in main floodplain zone. Locate stockpiles in wind protected areas if possible. Utilise vegetated areas as buffer zones between waterways and stockpiles.</p> <p>Implement sediment control and litter traps downstream of works in waterway, where necessary.</p> <p>Revegetate, seed or cover bare surfaces when not in use to minimise the exposure period.</p> <p>Test any water (including groundwater) produced during dewatering operations and determine appropriate disposal method.</p> <p>Collect and reuse site stormwater runoff for dust suppression and fill placement works to minimise water usage.</p> <p>Ensure low probability of rain prior to bituminous surfacing or painting applications</p>
	9.4 Post Construction	<p>Preparation and implementation of a Maintenance Strategy which will include:</p> <ul style="list-style-type: none"> - Post construction water quality testing. - A system for maintaining the integrity of run-off control systems to protect waterways.
10 Groundwater and contamination and salinity	10.1 Design	<p>If road construction results in groundwater seepage, a drainage system will be designed to capture and channel groundwater from beneath the road.</p> <p>Design the drainage system to manage potential for additional inundation where possible.</p> <p>Finalise design of the embankments and culverts to facilitate water dispersion.</p> <p>Where feasible select height, span and pier arrangements to reduce potential of saline groundwater impact.</p>

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
10 Groundwater and contamination and salinity (continued)	10.2 Pre-Construction	Undertake groundwater monitoring to determine appropriate actions if necessary. Where necessary, seek agreement for off-site discharge from the EPA (this depends upon the findings of the pre-construction water quality and groundwater monitoring programmes).
	10.3 Construction	Develop and implement CEMPs. The CEMP may include: - An assessment of likely groundwater interceptions including potential quantities and quality, and management of groundwater in accordance with legislative requirements. - Monitoring to ensure the beneficial uses of the groundwater are not compromised. - Procedures for review, rectification and removal of implemented groundwater management measures as appropriate. - Procedures for the monitoring, management and rectification of any subsidence associated with the works. Establish high density planting in areas where additional groundwater recharge is expected (the type of planting and densities will be developed in conjunction with a horticulturalist and with consideration to adjoining remnants of indigenous species). Any water from dewatering of bored piles will be disposed of in accordance with SEPP requirements. Adopt appropriate construction procedures for the protection of structural concrete and steel reinforcement in order to manage the corrosion potential of groundwater. Where possible, select construction methods to avoid the need for groundwater dewatering (eg. driven piles, sheetpiling).
11 Noise Nuisance	11.1 Post planning	Ensure that developers of noise sensitive uses approved following the application of the Public Acquisition Overlay for the OMR/E6 TC provide appropriate noise attenuation in accordance with VicRoads policies.
	11.2 Pre-Construction	Undertake detailed survey of ambient noise levels adjacent to the proposed alignment. Complete engineering and landscape concept design of noise attenuation barriers to meet VicRoads Traffic Noise Policy objective of 63dB(A) L10 (18 hour). Consult with Community Reference Group on noise barrier design.
	11.3 Construction	Provide noise attenuation for residential buildings and other noise sensitive developments such as schools and hospitals, to 63dB(A) for these buildings in accordance with VicRoads Traffic Noise Reduction Policy. Earthmoving plant, equipment and vehicles on site will be appropriately fitted and maintained with mufflers and noise abatement measures in accordance with Australian Standards. Restrict work to Monday to Saturday and daylight hours near all dwellings. Restrict access to a defined access routes only. Construct permanent noise barriers as early in the construction programme as practicable.
	11.4 Post Construction	Undertake noise monitoring
12 Visual Impacts	12.1 Design	Noise attenuation barriers to be designed with consideration for reducing visual impact. Incorporate architectural input into the design of bridges to create structures of visual interest.
	12.2 Pre Construction	In consultation with stakeholders a qualified landscape architect will prepare a detailed Visual Impact Assessment and Landscape Strategy.

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
12 Visual Impacts (continued)	12.3 Construction	<p>Construct earth mounding at the base of noise attenuation barriers (where feasible) to increase the height at which vegetation is planted and thus maximise the planting as a visual element.</p> <p>Incorporate earth mounding (subject to hydraulic and flood requirements) and tree planting in accordance with the Landscape Strategy developed. This will include specific locations along the length of the OMR/ E6 TC including interchanges, where relevant.</p> <p>Undertake tree planting in the vicinity of over passes to reduce the visual impact of the structure.</p> <p>Treat areas surrounding the creek crossings with a planting mix that reflects the surrounding riparian environs to extend and compliment the existing vegetation.</p>
13 Reduction in air quality	13.1 Pre-construction	<p>Establish air quality changes compared to the SEPP intervention levels.</p> <p>Establish background ambient dust levels.</p>
	13.2 Construction	<p>Contractors will prepare a Contractor Environmental Management Strategy (CEMS) and Plans (CEMPs) prior to works commencing which will include measure for dust control.</p> <p>Programming of works to consider risks of dust and air quality for critical areas (eg. Crops).</p> <p>Minimise the extent of vegetation clearance and disturbance of soil.</p> <p>Consider use of measures such as early hydro mulching on formation works in critical areas to minimize dust.</p> <p>Stockpiled topsoil to be covered or hydro mulched or sowed with sterile rye grass or equivalent non-invasive species, to stabilise topsoil.</p> <p>Implement erosion control measures and stabilise disturbed soil.</p> <p>Encourage practices such as deep ripping to leave exposed surfaces rough and cloddy to reduce wind velocities at the soil surface, construction of wind fences, paving and watering of haul roads, application of chemical dust palliatives and suppressants and vehicle wheel arch mounted dust collectors.</p> <p>Use water sprays to suppress dust on cleared areas and haul roads.</p> <p>Manage equipment and machinery movements to minimise the creation of dust.</p> <p>Suspend construction activities or implement alternative dust suppression measures during periods of high wind and temperature or during periods of high visible dust generation.</p> <p>Undertake rehabilitation and revegetation of disturbed areas as soon as practicable.</p> <p>Monitor dust near residences and critical areas.</p> <p>Regular maintenance of plant to limit exhaust emissions.</p>
	13.3 Post-construction	<p>Monitor rehabilitation and revegetation of disturbed areas (i.e. to ensure no areas are left as exposed earth and liable to create dust problems).</p>
14 Agriculture	14.1 Pre-construction	<p>Ensure engineering design minimises impacts on access to properties, the moving of stock and agricultural equipment, and the replacement/relocation of any groundwater pumping systems.</p> <p>Ensure that any grapevines and fruit trees within proposed freeway and access road ROW are completely removed and destroyed to minimise spread of disease or insect pests.</p>
	14.2 Construction	<p>Maintain access to properties at all times.</p> <p>Liaise with land owners to ensure access provisions are operating effectively.</p> <p>Implement the measures that will help to control the extent of impact that dust, soil erosion, weed invasion, altered surface hydrology etc. may have on agricultural land.</p>

Table C- 1 VicRoads Risk and Mitigation Measures Summary

Impact Category	Phase	Risk Management / Mitigation
15 Property severance	15.1 Pre-construction	<p>Prepare and implement a land acquisition programme in accordance with relevant legislative requirements.</p> <p>Negotiate with directly impacted landowners to determine compensation.</p> <p>Ongoing discussion with affected private and public transport operators and emergency services to address route impacts.</p> <p>Continue discussions with local landowners and service providers to understand the significance of potential property severance and to finalise construction and long term access provisions.</p> <p>Endeavour to consolidate remnant land parcels and effect land swaps where feasible to minimise the number of individual land holdings.</p>
	15.2 Construction	<p>Maintain access to properties at all times – with or without traffic control.</p> <p>Liaise with local residents and service providers to ensure access provisions are operating effectively.</p> <p>Complete land acquisition programme.</p>
16 Social impacts	16.1 Pre-construction	<p>Consideration of minor reservation boundary adjustments to reduce local impacts and the number of landowners impacted by the land acquisition process.</p> <p>Regular dialogue with impacted residents via brochures, open days, information displays, local community meetings as per agreed consultation plan.</p> <p>Regular updating of planning process as per agreed community consultation plan.</p> <p>Conduct discussions with landowners affected by the selected alignment.</p> <p>Commence negotiations with landowners on land acquisition provisions and programme.</p> <p>Actively pursue means to effect early property purchase where possible under provisions of legislation.</p> <p>Offer counselling to individuals, families and households affected by provision of highway upgrade.</p>
	16.2 Construction	<p>Hold meetings of the community liaison group to review the impacts of construction (e.g. noise and dust) and the effectiveness of environmental management controls. Review and respond as necessary.</p> <p>Provide information to the wider community on the progress of works, issues that will affect the community and programme to complete.</p>
	16.3 Post-construction	<p>Assist with consolidation of parcels of land where appropriate.</p>
17 Geology & Terrain	17.1 Pre-construction	<p>Undertake detailed geotechnical investigations along the reservation to determine ground conditions and identify detailed constructability issues.</p> <p>Geotechnical investigations to also investigate presence and quality of groundwater.</p> <p>Consider the potential impact of shallow groundwater tables on foundation conditions.</p>
18 Fire (& other emergencies)	18.1 Pre-construction	<p>Detailed arrangements for emergency access to be determined in consultation with the appropriate agencies and incorporated into the final design.</p> <p>Landscape plans will be prepared, having regard to the need to minimise the spread of wild fire.</p> <p>Discuss the need for any fire breaks or other prevention measures with DSE and Country Fire Authority (CFA).</p> <p>In conjunction with local emergency agencies such as Police, State Emergency Services and the Country Fire Authority, an emergency response plan will be developed for the OMR/E6 TC for a major site emergency during and after construction.</p>
	18.2 Construction	<p>Establish appropriate procedures based on CFA requirements.</p>