



Environment Construction Method Statement #1

General Construction

HEA-CMS-GL-ENV-001-00-01

Scope	This Environmental Construction Method Statement describes the environmental management measures to be applied to the establishment and operation of general construction sites.
Location/s	Whole project
Timing	Pre-construction and construction
Minister's COAs	CoAs 30 & 129

DOCUMENT CONTROL

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General Description:	This ECMS covers the establishment and on going operation of all general construction sites for the construction of a 13km expressway from the Newcastle Link Road interchange with the F3, through to Buchanan.			
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DOCUMENT REVISIONS

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EMR Certification

I have reviewed this ECMS and find it to be in accordance with the relevant Conditions of Approval and all relevant undertakings made in the EIS, Representations Report and the approved CEMP.

Signed:

Environmental Management Representative

Date:

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1 Introduction

This Environmental Construction Method Statement (ECMS) documents the requirements for works associated with establishment and operation of general construction sites. This document:

- addresses the requirements of the Minister's Condition of Approval 30 and 129 or the Hunter Expressway project,
- reflects the requirements of the Hunter Expressway Alliance (HEA) environmental management system (as detailed in the Construction Environmental Management Plan),
- incorporates the management measures from the relevant sub-plans
- describes the environmental management measures relating specifically to the construction activities and potential environmental issues.

This ECMS has been prepared as a practical environmental management tool for use by all HEA personnel and subcontractors and incorporates the assessment of the environmental and community risks for these works. The specific environmental and community management controls developed and detailed in the ECMS, include the following key information:

- Key site and management personnel - responsibilities and contact details.
- Operating hours.
- Construction details – activities, staging and schedule.
- Objectives and targets – monitoring requirements, criteria and procedures.
- Action tables/plans – inspection and test plans with actions, responsibilities, training, timing, reporting, monitoring/auditing and checklists.
- Site Drawings - Site layout, monitoring locations, erosion controls, noise barriers, discharge points and limits of clearing.

1.1 ECMS Overview

The General Construction ECMS will be used for all construction sites except where a specific ECMS has been prepared for a specific activity or location. Refer to the overview map contained in Attachment B and Table 1.1 for an overview description of all ECMSs. Based on the overview map, environmental constraints are further identified in the maps contained in Attachment C. Further details on each ECMSs is contained in the CEMP, Appendix H.

1.2 ECMS attachments

- Attachment A – Environmental Control Plan
- Attachment B - Overview of Construction Method Statements
- Attachment C – Environmental Constraints Maps

Table 1-1: ECMS Overview

ECMS Ref	General scope of works - construction	Environmental requirements	Key ECMS attachments
1. General Construction	<ul style="list-style-type: none"> • Site establishment works • Fence construction compounds • Grade sites and establish hardstand • Install washbays/rumble grids • Install fauna underpasses • Bulk earth works & stockpiling • Construct sediment basins • Dewater sediment basins • Rock breaking, saw cutting, sheet piling • Blasting 	<ul style="list-style-type: none"> • Establish erosion and sediment control • Fence to protect vegetation, fauna and heritage items • Suppress dust • Control weeds • Noise and vibration mitigation • Waste minimisation strategies • Contamination management • Monitor noise and vibration, dust, traffic, water quality and sensitive sites • Community notification 	<ul style="list-style-type: none"> • Environmental Control Plan • Environmental Constraints Maps • Overview of ECMSs
2. Clearing and Topsoil Management	<ul style="list-style-type: none"> • Clear and grub vegetation • Strip and stockpile topsoil 	<ul style="list-style-type: none"> • Pre-clearing survey • Habitat survey • Install nest boxes • Establish erosion and sediment control • Fence to protect vegetation, fauna and heritage items • Suppress dust • Control weeds • Stockpile management 	<ul style="list-style-type: none"> • Environmental Control Plan • Site Pre-clearing Checklist • Clearing and Grubbing Procedure
3. Construction Site Compounds	<ul style="list-style-type: none"> • Establish site fencing & hard stand • Install utilities and services • Install site buildings • Delivery of plant/equipment • Establish site access road and creek crossing • Establish storage compounds • Vehicle and equipment maintenance • Clearing for ancillary and access roads 	<ul style="list-style-type: none"> • Establish erosion and sediment control • Fence to protect vegetation, fauna and heritage items • Suppress dust • Waste minimisation strategies • Water quality monitoring –Surveyor Creek 	<ul style="list-style-type: none"> • Environmental Control Plan • Project Office Construction Compound • Surveyor Creek Erosion and Sediment Control Plan (ESCP) • Progressive ESCP for ancillary compounds
4. Concrete Production and Delivery (Batch plant)	<ul style="list-style-type: none"> • Establish concrete batch plant • Formwork and assembly • Aggregate stockpiling • Heavy truck movements 	<ul style="list-style-type: none"> • Establish erosion and sediment control • Wastewater treatment –batch plant operations • Fence to protect vegetation, fauna and heritage items • Suppress dust 	<ul style="list-style-type: none"> • Environmental Control Plan • Batch Plant overview • ESCP

ECMS Ref	General scope of works - construction	Environmental requirements	Key ECMS attachments
5. Access tracks for mine void treatment and viaducts	<ul style="list-style-type: none"> Clearing and grading Site drainage controls 	<ul style="list-style-type: none"> Establish erosion and sediment control Fence to protect vegetation, fauna and heritage items 	<ul style="list-style-type: none"> Environmental Control Plan Access Track Maps
6. Treatment of mine voids	<ul style="list-style-type: none"> Establish working platforms Drilling and infilling of old mine workings with grout Management of gas emissions Management of potential surface and sub-surface water quality. 	<ul style="list-style-type: none"> Establish erosion and sediment control Fence to protect vegetation, fauna and heritage items Contamination management Dust suppression Noise mitigation 	<ul style="list-style-type: none"> Environmental Control Plan ESCP Diagrammatic representation of drilling and grout filling
7. Newcastle Interchange at the F3	<ul style="list-style-type: none"> Traffic management for bridge construction On and off ramp construction Drainage works including sedimentation basin construction Traffic diversions Rehabilitation works 	<ul style="list-style-type: none"> Establish erosion and sediment control Fence to protect vegetation, fauna and heritage items Fauna underpasses Water quality monitoring Dust suppression Noise and vibration mitigation Waste minimisation strategies Community notification 	<ul style="list-style-type: none"> Environmental Control Plan ESCP
8. Temporary Waterway Crossings	<ul style="list-style-type: none"> Causeway, culvert and bridge construction Creek diversions Minor earthwork near waterway Batter and embankment construction Piling, pier construction and concreting Stockpiling of equipment and materials 	<ul style="list-style-type: none"> Consultation and approval from NSW Dept of Industry and Investment Establish erosion and sediment control ESCP developed for each waterway crossing Fence to protect vegetation, fauna and heritage items Water quality monitoring above and below stream 	<ul style="list-style-type: none"> Environmental Control Plan Waterway crossings map Typical Drainage Structure Diagram
9. Bridge structures over Wallis Creek Minmi Creek and Surveyor Creek	<ul style="list-style-type: none"> Establish working platforms Creek diversions Batter and embankment construction Piling, pier construction and concreting Earthworks Stockpiling of equipment and materials Paving 	<ul style="list-style-type: none"> Consultation and approval from NSW Dept of Industry and Investment Establish erosion and sediment control Fence to protect vegetation, fauna and heritage items (Minmi Creek) Water quality monitoring at Wallis and Minmi Creek Waste minimisation strategies Dust suppression 	<ul style="list-style-type: none"> Environmental Control Plan Bridge construction overview ESCP

ECMS Ref	General scope of works - construction	Environmental requirements	Key ECMS attachments
10. Buchanan Interchange	<ul style="list-style-type: none"> Traffic diversion Bridge construction on and off ramp construction activities Drainage works Sediment Basin construction Rehabilitation works 	<ul style="list-style-type: none"> Consultation and approval from NSW Dept of Industry and Investment Establish erosion and sediment control Fence to protect vegetation, fauna and heritage items Water quality monitoring Waste minimisation strategies Suppress dust 	<ul style="list-style-type: none"> Environmental Control Plan Buchanan Interchange overview ESCP
11. Viaducts in the Sugarloaf Ranges	<ul style="list-style-type: none"> Vegetation clearing Site establishment Establishment of bridge casting yards Pier construction Bridge construction Paving and finishing works 	<ul style="list-style-type: none"> Establish erosion and sediment control Water quality monitoring Fence to protect vegetation, fauna and heritage items Waste minimisation strategies Suppress dust 	<ul style="list-style-type: none"> Environmental Control Plan Sugarloaf Ranges Viaduct overview ESCP
12. Kurri Sands Swamp Woodland	<ul style="list-style-type: none"> Major earthworks Drainage works Paving Finishing works (barrier fencing, line-marking, etc) batter Rehabilitation works 	<ul style="list-style-type: none"> Establish erosion and sediment control Water quality monitoring Fence to protect vegetation, fauna and heritage items 	<ul style="list-style-type: none"> Environmental Control Plan ESCP
13. Site Stabilisation and Rehabilitation Works	<ul style="list-style-type: none"> Removal of redundant erosion and sedimentation controls Earth moving for landscaping and pavement works 	<ul style="list-style-type: none"> Establish fast growing cover crops Hydromulching and seeding Ongoing maintenance 	<ul style="list-style-type: none"> Environmental Control Plan ESCP

1.3 Key reference documents to ECMS

The development of this ECMS has been guided by the following detailed management plans and reports to assist in the development of mitigation of specific environmental issues for the works. This ECMS provides the required detail for day-to-day worksite activities and the management plans and reports will be referred as needed for specific information requirements:

Table 1-2: Relevant sub-plans to the ECMS

Issue	Relevant Plan(s)	Details
Noise & vibration (incl. blast management)	<ul style="list-style-type: none"> Construction Noise & Vibration Sub Plan (incl. Blast Management Strategy) Construction Noise Impact Statements 	Provides a comparison of measured background noise levels at sensitive receivers vs. predicted noise impacts, duration of impacts from site works and traffic, physical and site management measures to minimise impacts and compliance monitoring program.
Flora & Fauna Visual	<ul style="list-style-type: none"> Flora and Fauna Management Sub Plan Landscape Management Sub Plan 	Provides details of the location of sensitive environment, including EECs and management measures to prevent construction encroachment.
Soil and water quality	<ul style="list-style-type: none"> Soil & Water Management Sub Plan Landscape Management Sub Plan Spoil Management Sub Plan 	Provides details of the physical and management controls for surface runoff, erosion and sedimentation control, incident response and details of the compliance monitoring program.
Land contamination	<ul style="list-style-type: none"> Hazard & Risk Management Plan 	Provides details of the assessment of contamination.
Heritage	<ul style="list-style-type: none"> Aboriginal Cultural Heritage Management Sub Plan Historical Heritage Management Sub Plan 	Provides details of the location known and potential of archaeological sites and heritage sites as well as management measures to prevent damage or destruction.
Air Quality	<ul style="list-style-type: none"> Construction Air Quality Management Plan 	Provides details on the location of sensitive receivers, air quality impacts from construction works and mitigation strategies and measures.
Waste	<ul style="list-style-type: none"> Waste Management & Re-Use Sub Plan 	Provides details on the waste strategies and management measures to maximise reuse, minimise waste generation and ensure lawful disposal where required.

1.3.1 Additional relevant references

- Managing Urban Stormwater: Soil and Construction, Appendix C- Unsealed Roads. Dept of Housing (2006).

<http://www.environment.nsw.gov.au/resources/stormwater/0802soilsconststorm2c.pdf>

As in the development of the CEMP, all relevant RTA Specifications were incorporated in the development of the Environmental Control Plan, Attachment A.

Table 1-3: Key work instructions relevant to general construction activities

Activity	Work Instruction/Procedure/Protocols	Location
Environmental Incident	Emergency Procedure Incident Response Flowchart	CEMP section 3.8 &, App.E Hazard & Risk Subplan, App.B
Onsite vehicle and equipment refuelling	Refuelling Procedure Refuelling Protocol	CEMP, App.G Hazard & Risk Subplan, App.C
Work during the fire season ban	Work During the Fire Season Ban	Hazard & Risk Subplan, App.D
Air quality monitoring	Air Quality Monitoring Protocol	Air Quality Subplan, App. A
High wind conditions	Work Modification Record – Excessive Wind	Air Quality Subplan, App.B
Fauna underpasses and fauna fencing	Preliminary fauna mitigation structures and specifications	Flora & Fauna Subplan, App.A
Weed control	Weed management strategy	Flora & Fauna Subplan, App.B
Nest box installation pre clearing and during clearing	Nest box procedures and specifications	Flora & Fauna Subplan, App.C
Pre clearing activities	Habitat assessment, pre-clearing survey and fauna rescue procedure	Flora & Fauna Subplan, App.D
Clearing and grubbing	Clearing and grubbing procedure	Flora & Fauna Subplan, App.E
Work near historical heritage items	Historical Heritage Management Protocols	Historical Heritage Subplan, section 5.2
Work near aboriginal heritage items	Protocol for the Discovery of Aboriginal Objects during Construction and all	Indigenous Heritage Subplan, App.D

Activity	Work Instruction/Procedure/Protocols	Location
	Associated Works	
Work near aboriginal heritage items	Protocol for the Discovery of Possible Human/Human Skeletal remains during construction and all associated works	Indigenous Heritage Subplan, App.E
Management requirements for each aboriginal heritage site	Schedule of Management Strategies for the Protection of Aboriginal Heritage Sites	Indigenous Heritage Subplan, App.F
Complaints management	Complaints Handling Procedure	Noise & Vibration Subplan, section 12.2
Batching Plant, Pre-cast yard, site offices and compounds Out of hours Work	Construction Noise and Vibration Impact Statement- Batching Plant, Pre-cast yard, site offices and compounds	Noise & Vibration Subplan, App.B
Main bridge structures and intersections Out of hours Work	Construction Noise and Vibration Impact Statement - Main bridge structures and intersections	Noise & Vibration Subplan, App.C
Main Carriageway Works	Construction Noise and Vibration Impact Statement –Main Carriageway Works	Noise & Vibration Subplan, App.D
Blasting	Construction Noise and Vibration Impact Statement- Blasting	Noise & Vibration Subplan, App.E
Water Quality Monitoring	Water Quality Monitoring Work Procedure	Soil & Water Subplan, App. A
Dewatering	Dewatering Procedure	Soil & Water Subplan, App. B
Sediment Basin Discharges	Proposed Sediment Basins	Soil & Water Subplan, App C
ASS management	Acid Sulphate Soil Management Strategy	Soil & Water Subplan, App D
Works near creeks	Location of Drainage Structures, waterways and Water Quality Monitoring Locations	Soil & Water Subplan, App. F
Waste classification	Waste Management and Reuse – classification procedure	Waste & reuse Subplan, section 5
Forms for environmental audit and checklists	System Procedures	CEMP, App. F

2 Scope of works

This ECMS covers the establishment and ongoing operation of all general construction sites for the construction phase of a 13km expressway from the Newcastle Link Road interchange with the F3, through to Buchanan. The following scope of works for the General Construction ECMS applies to the proposed activities to be undertaken for the duration of the project.

Table 2-1: Scope of works

Key activities	Description of activities
Early Works	Clearing and grubbing, Access tracks widening, cross drainage structures –culvert construction
Site Establishment	Establish site compounds, Install and relocate utilities
Area 1: F3 Interchange (ch 0) – Stockrington Road (ch 1,440)	
Mine Subsidence Treatment –F31	Drilling, grouting and foundation works
Construction Stage 1- 8	Traffic mgt, clearing and grubbing, Strip topsoil, bulk earthworks –cut and fill, drainage structures, pavements, finishing Works
Structures BW 001 –BW007 and BW024	Headstone and anchors, construct abutments, pier construction, bridge girders, bracing, beams and decking
Finishing Works	Earthworks, drainage, pavement & fencing
Area 2: Stockrington Road (ch 1,440) to Rest Area (ch 8,100)	
Mine Subsidence Treatment –Viaduct 1, 2 & 3	Drilling, grouting and foundation works
Earthworks	Geotech, clear and grub, strip topsoil, bulk earthworks
Drainage	Culvert installation
Structures –BW008, BW009 (Twin Viaducts 1), BW010 (Twin Viaducts 2), BW011 (Twin Viaducts 3)	Piling, columns, abutments pier construction, foundation works, cast and launch, asphaltting, retaining walls
Pavement and Finishing Works	Fauna Fencing
Area 3 - Rest Area(ch 8,100) to Project End (ch 12,900)	
Construction Stage 1-6	Drain dam, traffic mgt, strip topsoil, Trim batters, cut and fill, bulk earthworks, demolish existing road and bridges, pavement, landscaping
Structures Structure BW 10 & BW 11 (cast and launch), BW14–16, BW18, BW19 & BW21	Piling, columns, abutments pier construction, pour decks, asphaltting
Buchanan works outside roundabout	
Earthworks	Geotech, clear and grub, strip topsoil, bulk earthworks
Drainage	Culvert installation
Structures –BW17E & W, BW 21	Work platforms, piling, pier construction, install and pour columns, construct abutments, asphaltting, pour deck, fauna fencing
Pavements	Laying base

2.1 General construction activities

Table 2-2: Indicative construction schedule

Activity	Start	Finish
<i>F3 Interchange (ch 0) – Stockrington Road (ch 1,440)</i>		
Early works	2 Aug 2010	17 Oct 2011
Site Establishment	16 Jul 2010	31 Aug 2012
Mine Subsidence Treatment	9 Dec 2010	10 Nov 2011
Construction Works (stages 1 -8)	19 Nov 2010	8 Aug 2013
<i>Stage 1 –Traffic Mgt</i>	19 Nov 2010	7 Dec 2010
<i>Stage 1 – Clear and grub</i>	24 Dec 2010	10 Mar 2011
<i>Stage 1 – Topsoil strip</i>	11 Mar 2011	18 Apr 2011
<i>Stage 1 – Bulk earthworks</i>	29 Apr 2011	30 Jun 2011
<i>Stage 1 - Culvert installation (C0016SA)</i>	11 Mar 2011	18 April 2011
<i>Stage 1 –Finishing works</i>	31 May 2011	7 June 2011
Structures BW 001 –BW007 and BW024	26 Sep 2011	29 May 2013
Landscaping and rehabilitation works	4 Oct 2010	8 Aug 2013
<i>Area 2: Stockrington Road (ch 1,440) to Rest Area (ch 8,100)</i>		
Clearing and Fencing (Ch 5600 – 8100)	2 Aug 2010	14 Dec 2010
Mine Subsidence Treatment for Viaducts 1,2 & 3	2 Aug 2010	18 Nov 2011
Earth works (geotech, clear & grub, strip topsoil & bulk earthworks)	3 Sep 2010	6 June 2013
Access Track Clearing	30 Aug 2010	22 Oct 2010
Drainage structures -culverts	11 April 2011	20 Jan 2012
Bridge Structure BW08	1 Dec 2011	17 Aug 2012
Structure BW009 –Twin Viaducts 1	7 April 2011	26 Jul 2013
Structures BW010 & BW011 -Twin Viaducts 2 & 3	24 May 2011	6 Aug 2013
Landscaping and rehabilitation works	3 Sep 2010	6 June 2013
<i>Area 3 - Rest Area(ch 8,100) to Project End (ch 12,900)</i>		
Clearing and Fencing (Ch 8100 – 9800)	2 Aug 2010	10 Sep 2010
Construction Works (stage 1-6)	24 Sep 2010	7 June 2013
<i>Stage 1 – Traffic Mgt</i>	24 Sep 2010	7 Oct 2010
<i>Stage 1 – Strip Topsoil</i>	8 Oct 2010	22 Nov 2010
<i>Stage 1 - Earthworks</i>	25 Nov 2010	14 Dec 2010
<i>Stage 1 – Cut and fill</i>	25 Nov 2010	29 April 2011
<i>Stage 1 – Trim batters, Topsoil and landscape</i>	2 May 2011	26 May 2011
<i>Stage 1 –Pavement and Finishing Works</i>	2 May 2011	26 May 2011
Structure BW 10 & BW 11 cast and launch	2 Dec 2011	25 Mar 2013
Structures BW14 -16, BW18-BW19 & BW21	8 Feb 2011	8 Aug 2011
Landscaping and rehabilitation works	24 Sep 2010	10 June 2013

Activity	Start	Finish
Pavements	3 Oct 2012	10 June 2013
Practical Completion – Road Open		20 Sep 2013
Project Completion –after demobilisation		5 Dec 2013

Major waterway structures of the project:

BW001 – Existing Bridge over F3 Freeway – Newcastle Link Rd
 BW002 – Bridge over F3 Freeway – Newcastle Link Rd
 BW003 – Bridge over F3 Freeway – Sydney to Newcastle Ramp
 BW004 – Bridge over F3 Freeway – Branxton to Sydney Ramp
 BW005 – Twin Bridges over Newcastle Link Road Off Ramp
 BW006 – Twin Expressway Bridges over Minmi Creek
 BW007 – On and Off Ramp Bridges over Minmi Creek
 BW008 – Bridge over Expressway at Stockrington Rd
 BW009 – Expressway Twin Viaduct Bridges No 1
 BW010 – Expressway Twin Viaduct Bridges No 2
 BW011 – Expressway Twin Viaduct Bridges No 3
 BW012 – Bridge over Daracon Quarry Access
 BW013 – Bridge over Surveyors Creek
 BW014 – Twin Bridges over Expressway at Buchanan Interchange
 BW015 – Twin Bridges over Expressway at Buchanan Interchange
 BW016 – On and Off Ramp bridges over Buchanan Rd
 BW017 – Twin Bridges over Wallis and Surveyors Creeks
 BW018 – Bridge at Surveyors Creek on John Renshaw Drive
 BW019 – Bridge over Wallis Creek on John Renshaw Drive
 BW020 – Culvert over Spring near Avery's Lane
 BW021 – Bridge over Expressway at Avery's Lane
 BW024 – Arch over Minmi Creek

2.2 Hours of operation

Normal construction hours apply to the activities included in this ECMS. These hours are:

- Monday to Friday 7:00 am – 6:00 pm
- Saturdays: 8:00 am – 1:00 pm
- Sundays & Public Holidays – no work

Where work is required outside these hours, an application will be made to DECCW in accordance with the out of hours protocol in the Noise and Vibration Management Plan.

2.3 Site rehabilitation and restoration

At the completion of construction, construction site compounds and facilities will be demobilised. Appropriate replanting with local native species will be undertaken in accordance with the Landscape Management Plan, prepared in consultation with Councils affected landowners and the Community Liaison Group.

3 Key roles and responsibilities

Project Environment Manager (PEM) and Environmental Officer (PEO)

The Project Environment Manager reports directly to the Alliance Project Manager. The Environment Manager has primary responsibility for managing all aspects of environmental management and compliance for HEA's design and construction phase. The Environmental Officer assists the PEM in delivering the following key responsibilities in relation to the Environmental Construction Method Statements (ECMS) are as follows:

- Prepare the ECMS and review the ECMS when changes to project design or construction method may affect the project environmental management.
- Determine whether proposed project changes are consistent with the project approval, present unacceptable environmental risk or may lead to a non-conformance with the Conditions of Approval.
- Develop Work Procedures where necessary in conjunction with SE to implement the ECMSs.
- Review erosion and sediment control plans and submit to Soil Conservationist for certification.
- Conduct regular monitoring of dust emissions and noise and vibration at sensitive receivers.
- Undertake regular site environmental inspections to review site management practices.
- Participate in site audits undertaken by regulators and the EMR.
- Attend Weekly Project Meetings and inform the project team of environment issues, provide monitoring results and escalate site environmental issues as necessary.
- Review Out of Hours Work requests prior to sending to DECCW.
- Obtain necessary approvals and undertake consultation with regulators and community as per the project environmental management requirements.
- Approve clearing as per Pre-clearing Checklist.
- Monitor works in sensitive environments, such as water quality and riparian vegetation at creek crossing, construction of fauna fencing and other structures
- Monitor adequacy of environmental controls and progressive rehabilitation works
- Report wildlife injury or death, when threatened species is identified in construction zone.
- Develop, revise and conduct the Site Environmental Induction and training materials.
- Contract environmental specialist when required for: habitat clearance; vegetation clearing; blasting; vibration monitoring; erosion and sediment control issues, etc.
- Authority to suspend work to prevent environmental harm or unacceptable impact on community
- Advise Site Supervisor and report to Alliance Project Manager all site environmental management issues.
- Provide site staff ongoing advice on environmental issues and incident management requirements.

- Report to regulatory authorities as required by the Conditions of Approval, including any non-conformances or incidents.
- Conduct random audits of compliance with the ECMS.
- Review community information/notification materials regarding environmental management practices and monitoring as required prior to public release.
- Work with CRM in the preparation of a environment update for community newsletters and leaflets.
- Work with CRM in response to community complaints regarding noise, vibration, dust or traffic issues.

Community Relations Manager (CRM)

For specific roles and responsibilities of the Community Relations Manager and the community relations team refer to the Community Engagement Strategy. The key responsibilities of the Community Relations Manager in relation to the ECMS are as follows:

- Manage the Complaints Management System
- Respond to community complaints
- Monitor and record complaints
- Inform the community of construction progress and anticipated works
 - Develop and deliver letterbox drops, local newsletters, leaflets, newspaper advertisements, and community noticeboards for works such as traffic disruptions and controls, construction of temporary detours and work required outside the nominated working hours prior to such works being undertaken.
 - Advertise every 3 months in local newspaper the proposed works for the forthcoming 3 months
- Consult with the community as per the Community Engagement Strategy.

Alliance Project Manager (APM)

HEA's Project Alliance Director is principally responsible for delivery of the design and construction phase of Hunter Expressway (Alliance Section) to ensure impacts are minimised and obligations met. An Environment Manager reporting directly to the HEA Project Director is responsible to ensure HEA delivers prescribed environmental outcomes through various design and construction divisions. The HEA Project Director shall:

- Approve changes to the ECMS.
- Ensure adequate resources are made available for effective environmental management.
- Ensure effective overall management of environmental performance during construction.
- Incorporate environmental management aspects in project planning, including environment as a standing agenda at weekly management meetings.
- Ensure all complaints are resolved satisfactorily.
- Proactively manage community and environmental issues and effectively liaise with affected external groups.
- Stop work activities that have (or are likely to) lead to an unacceptable level of environmental risk.

- Ensure site management teams comply with applicable obligations by working in accordance with Community and Environmental Management Plans and procedures.
- Notify HEA leadership team of significant community and environment issues.
- Make available resources and contractor relationships for the EM to perform their function(s).
- Provide leadership and drive the performance of site management personnel.

Site Construction Manager (CM)

The Site Construction Manager reports directly to the Alliance Project Manager. The Site Construction Manager has primary responsibility for managing all aspects of construction for HEA's design and construction phase. The key responsibilities of the Site Construction Manager in relation to the ECMS are as follows:

- Consult with PEM regarding design for progressive works and any design changes, which may affect the project environmental management.
- Request PEM revise the ECMS when required.
- Review ECMSs.
- Advise PEM when Out of Hours work is required.
- Approve work procedures where required to implement the ECMSs.
- Review work instructions, JSEAs and other construction documentation in light of project environmental requirements and determine when PEM review is also required
- Review site inspections and site audit reports and respond accordingly.
- Conduct Weekly Project Meetings with PEM, SE and SS to inform upcoming works, raise site issues including monitoring results and review management measures.
- Review community information/notification materials prior to public release.
- Inform SS when vegetation clearing may proceed, ie when Pre-clearing Checklist has been submitted by PEM to CM.
- Review the works program to ensure work is scheduled to minimise impacts on the environment and community, ie to time works so that site and community exposure is minimised and to avoid extreme weather.
- Suspend or reschedule work due to extreme weather, high winds, total fire bans, and rain events that may result in community impact or cause environmental harm.
- Suspend work and notify the PEM when a suspected archaeological items is identified by site staff or when suspected contaminated materials, including acid sulphate soil are encountered.
- Monitor site environmental practices, behaviours and culture and initiate changes where required.
- Ensure the procurement of appropriate environmental management controls, such as silt fencing, rumble grids, geotextile material, sandbags, straw bales, waste skips, etc to minimise impact on community and the environment.
- Ensure appropriate construction equipment and appropriate trained human resources are allocated to establish and maintain environmental controls as detailed in the erosion and sediment control plan and the ECMS.

- Establish strategies and work practices to efficiently manage construction materials (such as spoil) and resources (such as fuels and water) to avoid waste generation, maximise reuse, minimise pollution including greenhouse gas generation and minimise landfill disposal.
- Initiate the commencement of progressive site rehabilitation.
- Allocate incident response roles and responsibilities to site staff and ensure systems are in place for the management of incidents.
- Ensure all incidents are reported to authorities, regulators and the Alliance.

Site Engineer (SE) / QA Manager

- Develop work procedures where necessary in conjunction with PEM to implement the ECMSs.
- Conduct regular and random site inspections to review work practices and the environmental impact of construction works.
- Routinely check correct versions of the ECMS are on site and sign off by all site employee.
- Install site signage where required by the ECMS to manage environmental impact, ie minimise speed, avoid wildlife injury, dust and noise generation.
- Report to PEM and CM any environmental issues that may warrant additional measures, suspension or rescheduling of works.
- Develop ancillary site layouts and identify suitable locations for the stockpiling of materials and spoil, concrete washout, etc. in consultation with PEM and advise SS accordingly.
- Procure appropriately sized equipment and machinery to minimise fuel/energy demand, minimise exhaust emissions and dust generation.
- Monitor weather conditions and ensure weather conditions inform work program and schedule.
- Prepare the works program/schedule of works.
- Prepare erosion and sediment control plans for PEM review and Soil Conservationist certification.
- Ensure design complies with the environmental requirements, and appropriate materials are procured, eg. aggregate size and culvert type and dimension for fish passage at creek crossing, etc.
- Identify appropriate changes to work practices in response to community complaints in consultation with CRM.
- Review construction updates for community newsletters and leaflets.
- Attend Weekly Project Meetings and provide input and feedback regarding site environmental management.

Site Supervisor (SS)

Responsible for supervising all construction work and has a direct role in the compliance with identified environmental procedures and controls. The key responsibilities of the Site Supervisor are to:

- Translate the requirements of the ECMS into the JSEA.
- Ensure all site crew have read and understood and signed the JSEA.
- Ensure any updates to the ECMS are provided and kept on site and have been signed by site

staff.

- Oversee site works to ensure conformance to the ECMS.
- Report to CM and PEM when suspected archaeological items is identified by site staff or suspected contaminated materials, including acid sulphate soils are encountered.
- Consult, inform or seek advice from the PEM in regard to all site environmental issues and incidents.
- Attend Weekly Project Meetings and provide input and feedback regarding site environmental management.
- Prior to commencement of works ensure environmental controls are as per the erosion and sediment control plan and the ECMS are in place.
- Prior to commencement of clearing, ensure the Pre-clearing Checklist has been signed by the PEM and the Ground Disturbance Checklist is signed off by the CM.
- Ensure weed infested areas in the construction zone are treated prior to clearing and cross contamination with clean fill is prevented.
- Establish clear boundaries, such as fencing for compounds sites, material and spoil stockpiles sites and access tracks to prevent construction encroachment on bushland areas and nearby creeks.
- Ensure construction machinery and equipment is well maintained to prevent spills, visible emissions and is not left idling.
- Ensure works practices and methods minimise environmental impact by preventing erosion and sedimentation, preventing construction encroachment into bushland, preventing injury to wildlife and prevent pollution of waters.
- Change work practices in response to complaints in consultation with SE.
- Inform CM and PEM when site works are progressively completed for the commencement of rehabilitation works.
- Implement waste avoidance practices, facilitate reuse and ensure appropriate waste removal and disposal from site.

3.1 Key contact details

Table 3-1: Key contact details

Position	Name/organisation	Mobile
Project Environment Manager	Tracy Doczy	0439 300 118
Environmental Officer	Erran Woodward	0437 343 178
Community Relations Manager	Louise Neville	0447 464 031
Alliance Project Director	Peter Chatburn	0418 233 905
Construction Manager	Aiden Mc Cann	0418 627 085
Constructability Manager	Todd Myers	0418 637 173
Design Manager	Bruce Sweet	0423 887 549
QA Manager	Siri Siritharan	0417 480 049
	Native Animal Trust Fund– Wildlife Rescue Service	0418 628 483
	DECCW –Environment Line	131 555

4 Statutory requirements and approvals

A summary of the key statutory requirements and approvals for the works are detailed below.

Table 4-1: Legislation and statutory obligations

Regulator	Licence/Approval etc	Relevant works
NSW Dept of Industry and Investment	As a Part 3A project, rather than permit requirements, approval is required for the following: <ul style="list-style-type: none"> Dredging or reclamation (s.201) Blockage of fish passage (s.219) 	Dredging, reclamation or blockage of creek flows (<i>this includes placing of silt fences in creeks</i>) (Note: RTA must notify Minister for Fisheries under Part 7 (div 3) the Fisheries Management Act 1994)
NSW Dept of Industry and Investment	MCoA -Consultation	Construction of temporary platforms for piles and pier construction in creeks
NSW Dept of Industry and Investment	MCoA -Consultation	Design and timing of bridge construction
NSW Dept of Industry and Investment, Dept of Planning	MCoA -Approval	Earthen platforms or placing of fill in creeks
Dept of Planning	MCoA -Comply with Blue Book: <i>Managing Urban Stormwater: Soil and Construction</i>	Design and construction of waterway crossing and erosion sediment control structures
DECCW	Environmental Protection Licence - POEO Act 1997	Discharge from sediment basins Impact on waterways Noise criteria
DECCW, Dept of Planning	Approval as per MCoA -60	To clear areas that exceeds project limits
DECCW	Licence to harm or pick threatened species, populations or ecological communities or damage habitat	Clearing or disturbed areas threatened species, populations, or EEC Seed and cutting collection
NSW Heritage Council	NSW Heritage Act 1977: s139 excavation permit s146 notice of relic discovery	Excavation near a heritage item

Regulator	Licence/Approval etc	Relevant works
DECCW	National Parks and Wildlife Act 1974: s87 / s90 Aboriginal Heritage Impact Permit	Construction works near an aboriginal sites

Note: Refer also to Table 3.5 in the CEMP for further information on the consultation with external stakeholders.

4.1 Revision of ECMS to reflect licence conditions

Up-to-date copies of each licence are kept on site for reference as required.

4.2 Minister's Conditions of Approval

Each CEMP subplan addresses the relevant Minister's Conditions of Approval (MCoA) for this project. The MCoA relevant to the development of this General Construction -Construction Method Statement is listed below with cross reference to where the condition is addressed in this or other project management documents.

Table 4-2: Matrix of Minister's Condition of Approval 30

Reference	CoA 30 Requirement	ECMS Reference
	The Proponent shall prepare Construction Method Statements (CMS) identified in the CEMP required by Condition 24. CMSs must be certified by the EMR as being in accordance with the Conditions of Approval and all undertakings made in the EIS, Representations Report and the Approved CEMP.	Page 2
	Each CMS shall include, but not be limited to:	
i	construction activities and processes associated with the relevant construction site(s), including staging and timing of the proposed works;	1. Introduction and 2. Scope of works
ii	specific hours of operation for all key elements including off-site movements;	2. Scope of Works 2.2 Hours of operation
iii	cover specific environmental management objectives and strategies for the environmental system elements and include, but not be limited to:	Environmental Control Plans - Attachment A - will cover relevant issues
	• noise and vibration;	✓
	• air quality;	✓
	• water quality;	✓
	• erosion and sedimentation;	✓
	• access and traffic;	✓
	• property acquisition and/or adjustments	CEMP

Reference	CoA 30 Requirement	ECMS Reference
	<ul style="list-style-type: none"> heritage and archaeology 	✓
	<ul style="list-style-type: none"> flora and fauna 	✓
	<ul style="list-style-type: none"> groundwater 	✓
	<ul style="list-style-type: none"> acid sulfate soils 	✓
	<ul style="list-style-type: none"> spoil stockpiling and disposal 	✓
	<ul style="list-style-type: none"> waste/resource management 	✓
	<ul style="list-style-type: none"> weed management 	✓
	<ul style="list-style-type: none"> flooding and stormwater control 	✓
	<ul style="list-style-type: none"> geotechnical issues 	Soil and Water subplan
	<ul style="list-style-type: none"> visual screening 	Landscape Management subplan
	<ul style="list-style-type: none"> landscaping and rehabilitation 	Landscape Management subplan
	<ul style="list-style-type: none"> safety, hazards and risk 	✓
	<ul style="list-style-type: none"> energy use 	CEMP
	<ul style="list-style-type: none"> resource use and recycling 	✓
	<ul style="list-style-type: none"> utilities 	✓
iv	address, but not be limited to:	
	a. identification of the statutory and other obligations which the Proponent is required to fulfil during project construction, including all approvals and consultations/agreements required from other authorities and stakeholders, and key legislation and policies which control the Proponent's construction of the project;	4. Statutory requirements and approvals
	b. measures to avoid and/or control the occurrence of environmental impacts;	Environmental Control Plan - Attachment A
	c. measures (where practicable and cost effective) to provide positive environmental offsets to unavoidable environmental impacts;	The key environmental offsets related to the worksite will be realised during the post construction rehabilitation.
	d. definition of the role, responsibility, authority, accountability and reporting of personnel relevant to compliance with the CMS;	3. Key roles and responsibilities & ECP in Attachment A
	e. site specific environmental management techniques and processes for all construction processes which are important for the quality of the environment in respect of permanent and/or temporary works;	ECP in Attachment A
	f. site specific monitoring, inspection and test plans for all activities and environmental qualities which are important to the environmental management of the project, including performance criteria, tests, and protocols (eg. frequency and location);	6. Monitoring and inspections
	g. locational details of important elements such as temporary noise barriers; portable offices and amenities; truck, plant and materials storage; access locations; provision of site hoardings etc;	ECP in Attachment A

Reference	CoA 30 Requirement	ECMS Reference
	h. environmental management instructions for all complex environmental control processes which do not follow common practice or where the absence of such instructions could be potentially detrimental to the environment;	Table 1.3
	i. steps the Proponent intends to take to ensure that all Plans and Sub Plans are being complied with;	CEMP
	j. consultation requirements with relevant government agencies and utility/ service providers; and,	ECP in Attachment A
	k. community consultation and notification strategy (including local community, businesses, relevant government agencies, and all relevant Councils), and complaint handling procedures.	ECP in Attachment A
	Specific requirements of the main environmental system elements referred to in (iii) shall be as required under the conditions of this approval and/or as required under any licence or approval. All CMS shall be made publicly available	Section 4.3

4.3 Consultation process

Consultation for the project has been undertaken with agencies and stakeholders including:

- Department of Planning
- DECCW
- Lake Macquarie City Council
- Maitland City Council
- Cessnock City Council
- Industries and Investment NSW
- Utility providers
- Local Aboriginal Land Councils

Ongoing consultation during the works covered under this ECMS will be undertaken with relevant stakeholders where changes to works occur under this ECMS. Specifically DoP and DECCW will be notified where necessary.

Any further updates to the ECMS requires EMR endorsement and a summary of changes and updates will be provided to the public for their information, and a full copy of the ECMS be made available on the internet, following EMR endorsement.

5 Site induction and training

5.1 Induction

All project personnel, subcontractors, consultants and visitors receive inductions into HEA's environmental obligations prior to commencing on site. The environmental component of the induction program was prepared and submitted to the EMR for review and endorsement. The Induction Courses are reviewed on a six monthly basis or in the event of a substantial change in environmental procedure, to ensure it reflects current working practice. Project Induction Courses fall into two categories, detailed below.

A. General project environmental induction

The induction covers the following environmental components with respect to the project as a whole:

- Application of relevant legislation, the MCoA, and other licences and permits.
- Community issues.
- Hours of operation.
- Noise and vibration.
- Erosion and sedimentation control.
- Traffic and access.
- Indigenous and non-indigenous heritage.
- Flora and fauna.
- Role of the EMR.
- The principles of ecologically sustainable development in construction.

B. Worksite Inductions

Worksite Inductions highlight the specific environmental requirements and activities being undertaken at each worksite. The environmental component of this induction will cover:

- The scope and requirements of the specific Construction Method Statement.
- Application of relevant legislation, the MCoA, and other licences and permits.
- Hours of operation.
- Noise and vibration limits/ mitigations measures necessary.
- Erosion and sedimentation control measures to be implemented during works.
- Local sensitive receivers to noise, dust, vibration etc. and local community issues.
- Traffic/access, location of entry/exit points, traffic routes, parking.
- Identification of Indigenous and Non-indigenous heritage items on site.
- Flora and fauna mitigation measures to be implemented.

5.2 Training

Refer to the CEMP section 3.6 for the specific training requirements for all key construction roles and responsibilities. Additional training may be identified by the project team through toolbox talks, however the project environmental team will be primarily accountable for identifying any additional training requirements as part of project planning, ie for specific sites, such as Minmi Creek, and through site inspections.

6 Monitoring and Inspection

Refer to the Environmental Control Plan, Attachment A for details on monitoring and inspection.

7 Revisions

Revisions to the ECMS will be made as required and changes will be endorsed by the Environmental Management Representative (EMR) as required.

The current copy of this ECMS is kept at the worksite and at the HEA Project Display Office following EMR endorsement (where they may be viewed on request) and a summary of the update provided to community members for their information.

8 Document control

Project document control is detailed in the PMP and project filing and numbering is defined in Management Procedure HEA-MP-GL-OPS-002-00. When the document is reviewed a new revision number is assigned by the Environmental Manager.

The current revision of the ECMS and specifically the ECMS Drawing Sheets (1-3) will be available and displayed in site offices for ongoing implementation and amendment as conditions or approval change.

9 Attachments

Attachment A – Environmental Control Plan

Attachment B – Construction Method Statement Overview

Attachment C – Environmental Constraints Maps

Attachment A

Environmental Control Plan

Environmental Control Plan : General Construction

Construction Activity	Start	Finish
<i>F3 Interchange (ch 0) – Stockrington Road (ch 1,440)</i>		
Early works	2 Aug 2010	17 Oct 2011
Site Establishment	16 Jul 2010	31 Aug 2012
Mine Subsidence Treatment	9 Dec 2010	10 Nov 2011
Construction Works (stages 1 -8)	19 Nov 2010	8 Aug 2013
<i>Stage 1 –Traffic Mgt</i>	19 Nov 2010	7 Dec 2010
<i>Stage 1 – Clear and grub</i>	24 Dec 2010	10 Mar 2011
<i>Stage 1 – Topsoil strip</i>	11 Mar 2011	18 Apr 2011
<i>Stage 1 – Bulk earthworks</i>	29 Apr 2011	30 Jun 2011
<i>Stage 1 - Culvert installation (C0016SA)</i>	11 Mar 2011	18 April 2011
<i>Stage 1 –Finishing works</i>	31 May 2011	7 June 2011
Structures BW 001 –BW007 and BW024	26 Sep 2011	29 May 2013
Landscaping and rehabilitation works	4 Oct 2010	8 Aug 2013
<i>Area 2: Stockrington Road (ch 1,440) - Rest Area (ch 8,100)</i>		
Clearing and Fencing (Ch 5600 – 8100)	2 Aug 2010	14 Dec 2010
Mine Subsidence Treatment for Viaducts 1,2 & 3	2 Aug 2010	18 Nov 2011
Earth works (geotech, clear & grub, strip topsoil & bulk earthworks)	3 Sep 2010	6 June 2013
Access Track Clearing	30 Aug 2010	22 Oct 2010
Drainage structures -culverts	11 April 2011	20 Jan 2012
Bridge Structure BW08	1 Dec 2011	17 Aug 2012
Structure BW009 –Twin Viaducts 1	7 April 2011	26 Jul 2013
Structures BW010 & BW011 -Twin Viaducts 2 & 3	24 May 2011	6 Aug 2013
Landscaping and rehabilitation works	3 Sep 2010	6 June 2013
<i>Area 3 - Rest Area(ch 8,100) - Project End (ch 12,900)</i>		
Clearing and Fencing (Ch 8100 – 9800)	2 Aug 2010	10 Sep 2010
Construction Works (stage 1-6)	24 Sep 2010	7 June 2013
<i>Stage 1 – Traffic Mgt</i>	24 Sep 2010	7 Oct 2010
<i>Stage 1 – Strip Topsoil</i>	8 Oct 2010	22 Nov 2010
<i>Stage 1 - Earthworks</i>	25 Nov 2010	14 Dec 2010
<i>Stage 1 – Cut and fill</i>	25 Nov 2010	29 April 2011
<i>Stage 1 – Trim batters, Topsoil and landscape</i>	2 May 2011	26 May 2011
<i>Stage 1 –Pavement and Finishing Works</i>	2 May 2011	26 May 2011
Structure BW 10 & BW 11 cast and launch	2 Dec 2011	25 Mar 2013
Structures BW14 -16, BW18-BW19 & BW21	8 Feb 2011	8 Aug 2011
Landscaping and rehabilitation works	24 Sep 2010	10 June 2013
Pavements	3 Oct 2012	10 June 2013
Practical Completion – Road Open		20 Sep 2013
Project Completion –after demobilisation		5 Dec 2013

Construction Air Quality Management	
Sub Plan ref: Construction Air Quality Management Plan	
<p>Objective: To minimise dust generation and manage emissions from construction activities to prevent impacts on surrounding receivers.</p> <p>Performance Criteria:</p> <ul style="list-style-type: none"> • Depositional dust goals of max 4 g/m² per month, subject to monthly background levels, as per DECCW guidelines. • No complaints received from nearby residents or local road users. 	
<p>Monitoring sites/sensitive receivers:</p> <p>Location 1: F3 Freeway, North-bound on-Ramp, Seahampton, located at the southern end of works (100m - 500m)</p> <p>Location 2: John Renshaw Drive, Buchanan, near the southern end of works. (70km SW of nearest residence)</p>	
Mitigation Measures	Responsibility
Pre-construction	
Consult with local residents before works begin (i.e. site clearing and major earthworks nearby) and notify of the nature and timing of the work.	CRM
Dust suppression activities	
Regularly control dust emissions using water sprays on water carts over unsealed trafficable areas, earthworks and stockpiles, and other surfaces as necessary. Ensure carts are available and maintained at all times.	SS, SE
Water can only be extracted for dust management or other construction related activities from sources approved by the Environment Manager. For example, sediment basins, local dams where allowed. All water movements are to be covered by a water movement permit ¹ .	CM
Clean any dirt tracked onto public roadways from construction vehicles using brooms or a street sweeper.	SS, SE
Suspend work if excessive dust generation from surface dirt accumulation occurs until dust emissions are controlled.	SE, CM, PEM
Enclose storage / weigh bin tops to minimise wind-generated dust emissions.	SS
No open burning or incineration on site unless otherwise approved by the EPA.	SS
Minimise clearing at any one time by leaving vegetation within work sites and within the corridor unless clearing is absolutely necessary.	SS, SE
Commence revegetation of cleared areas as soon as practicable to prevent or minimise wind blown dust.	SS, SE
Vehicle, plant and equipment	
Cover loads and secure tailgates from construction vehicles prior to leaving worksite to prevent loss of load on public roads and areas accessible to the public. Any spillage is required to be removed within 24 hours.	SS
Restrict and monitor construction traffic using local unsealed roads to 40 km/hr. Install signage.	SS, SE
Control access to all construction areas to specific entry/exit points and confine vehicle	SS, SE

¹ The water movement permit system is an onsite system designed to track and check use of water across the site. Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Construction Air Quality Management	
movements to designated construction areas.	
Provide facilities, such as rumble grids at site exit points to minimise tracking mud, dirt or other material onto a public road or footpath.	SE, CM
Ensure wheels and undercarriage of trucks are clean prior to the exiting the worksite. (See the flora and fauna section for more detail on these measures).	SE, CM
Service construction plant, vehicles and equipment regularly and maintain in top condition so that existing exhaust emissions standards are met or surpassed.	SS, SE
In the event of visible smoke emissions from equipment lasting longer than 10 seconds duration, have equipment taken out of service and adequately repaired or tuned so that smoke is no longer visible for periods exceeding 10 seconds.	SS
Plant or equipment is not to be left idling for longer than 15 minutes.	SS
Stockpiling	
Revegetate temporary stockpiles to stabilise the soil and minimise wind erosion.	SS, SE
Establish quick growth cover crops to protect long-term topsoil stockpiles and cleared areas as soon as possible after completion. (See soil and water section for more detail on stockpiling).	SS, SE
Extreme Conditions	
On high wind days, either reprogram construction activities work that could cause a nuisance or danger to people or property, or relocate to areas removed from sensitive receptors.	SE, CM
No spark generating activities (such as welding) on days with a Total Fire Ban.	CM
Avoid use of lime for stabilisation activities during windy days.	SS, SE
A call out system will be in place to respond to dust suppression requirements out of hours and on weekends.	CM
Monitoring	
Monitor dust deposition monthly throughout construction to determine effectiveness of dust suppression measures. Review and modify dust control and operational procedures if dust deposition levels are exceeded.	PEM
Monitor and record weather conditions, including rainfall, wind speed, wind direction and humidity on a 24hr basis. On high wind days where on site controls cannot prevent transport of dust, make a record of: date, time, location, wind, direction, wind speed, pre-existing dust controls, additional controls implemented; and modifications to work implemented.	CM
Monitor and record any complaints received in relation to air quality.	CRM, PEM
Visually monitor dust during daily inspections during pre-construction and construction phase.	SE, PEM
Regularly monitor the work sites to ensure that water spraying is not causing any erosion or sediment impacts.	SS, PEM
Complete regular inspections of public roads at access points and construction site exits to monitor efficiency of wash down/rumble grid facilities.	SE, PEM
Under adverse weather conditions inspect active work areas and any areas that have been stripped and rehabilitation not completed.	PEM
Undertake periodic visual checks of exhaust systems from construction plant, vehicles and machinery.	PEM

Noise and Vibration Management

Sub Plan ref: Construction Noise and Vibration Management Plan (incl. Blast Management Strategy)

Objective

To minimise the impacts of noise and vibration from construction activities on surrounding receivers.
To maintain vibration levels within human comfort and structural damage criteria.

Performance Criteria: Ensure noise exceedances are avoided by monitoring at sensitive receiver and where exceedances impacts on residents, apply mitigation strategies as detailed herein.

Sensitive Receivers Noise Monitoring Location and Criteria

Location	RBL L _{A90} dB(A)			Criteria L _{Aeq} , 15min dB(A)		
	Day	Evening	Night	Day	Evening	Night
"Frogella" 21 Brooks Street, Kurri Kurri	37	39	32	47	44	37
77 Clift Street, Heddon Greta	36	34	30	46	39	35
14 Anvil Street, Stanford Merthyr	36	39	31	46	44	36
Lot 83 Averys Lane, Buchanan	43	39	33	53	44	38
263 John Renshaw Drive, Buchanan	45	44	33	55	49	38
"Grandview" John Renshaw Drive, Buchanan	44	39	30	54	44	35
48 Fifth Street, Seahampton	38	39	37	48	44	42

Note: Daytime (7.00am-6.00pm); Evening (6.00pm-10.00pm); Night time (10.00pm-7.00am)

Note: Add 5 dB(A) to the measured construction noise level for tonal or impulsive construction activity.

Construction Traffic Noise:

- Less than 60 dB(A) L_{Aeq,1hr} during working hours; 55 dB(A) L_{Aeq,1hr} outside of working hours
- Not to increase existing noise at any receiver > 2 dB(A).

Vibration Objectives - Human Exposure:

Location	Vibration Dose Value intermittent vibration m/s ^{-1.75}	
	Day time	Night time
Residences	0.2 – 0.4	0.13 – 0.26
Offices, schools, education institutions and places of worship	0.4 – 0.8	0.4 – 0.8

As per human exposure to vibration goals, BS 6472 and AS 2670

Vibration Objectives - Structural damage:

Location	Vibration level mm/s		
	< 10Hz	10 – 50 Hz	50 – 100 Hz
Residences	5	5 – 15	15 – 20
Commercial/ industrial premises	20	20 – 40	40 – 50
Sensitive vibration structures	3	3 – 8	8 – 10

As per structure damage vibration guidelines, DIN 4150 & BS 7385: Part 2 – 1993

Heritage sites/structures:

3 mm/s for vibration sensitive Indigenous heritage locations and railway structures.

Blasting Criteria: *(as per ANZECC technical guidelines, 1990 & AS2187-2-2006)*

- Maximum overpressure 115 dB(Lin) for more than 5% of blasts in any year, and should not exceed

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Noise and Vibration Management	
<p>120 dB(Lin) for any blast.</p> <ul style="list-style-type: none"> The maximum peak particle ground velocity should not exceed 5mm/sec for more than 5% of blasts in any year, and should not exceed 10mm/sec for any blast. Peak Particle Velocity (PPV) vibration goals of 15mm/s up to 50 mm/s specific to receiver type and the dominant frequency range of the vibration pulse. <p>Note: During the planning of individual blast events structural vibration objectives shall be established for potentially affected buildings and structures in consultation with the specialist blasting contractor.</p>	
Noise Mitigation Strategies	Responsibility
Consult with sensitive receivers regarding upcoming construction activities.	CRM
Select appropriately sized and low noise construction plant. Fit silencers and acoustic screens (or similar ameliorative measures) to vehicles and equipment when required.	SE, CM
Maximise the offset distance between noisy plant items and sensitive receivers.	SE, CM
Avoid using noisy plant simultaneously and/or close together, adjacent to sensitive receivers.	SE, SS
Minimise consecutive night time works in the same locality, where feasible.	SE, CM
Orientate equipment away from sensitive receivers.	SS, SE
Carry out loading and unloading away from sensitive receivers.	SS, SE
Select site access points and roads as far as possible away from sensitive receivers.	SE, CM
Use portable enclosures around mobile and fixed plant where noise impacts are likely to be unacceptable where practical.	SE, CM
Restrict heavy vehicle movements entering and departing construction work sites to 7.00am to 6.00pm (Mon – Fri), and 8.00 – 1.00pm Sat with no works on Sundays and public holidays unless DECCW approval granted.	SE, CM
Schedule construction works to minimise works during sensitive early morning and evening periods and works outside of standard construction hours. Timetable works would include time and duration restrictions and respite periods.	SS, SE
Discuss the opportunity for alternative arrangements with affected residents, such as temporary relocation when required.	SE, CM
Rock breaking, rock hammering and sheet piling	
<p>Schedule these activities between :</p> <p>I. 8am – 12pm, Mon – Sat; and</p> <p>II. 2pm - 5pm Mon to Fri.</p> <p>Schedule a minimum respite period of 1 hour. Seek DECCW approval for agreement out of these hours.</p>	SE, CM
Noise and Vibration Mitigation Measures	
Undertake letterbox drops or direct consultation to local residents at least two weeks prior to "noisy" activities such as piling works.	CRM
Advise residents via local media and letterbox drops at least 7 days prior to any saw cutting.	CRM
Install signage on site to ensure workers are aware of the works hours on site for noisy activities.	SS, SE
Investigate and rectify any unusually noisy equipment.	SS, SE
Construction -hours of work	
<p>Construction hours are:</p> <p>7:00 am to 6:00 pm Monday to Friday,</p> <p>8:00 am to 1:00 pm Saturday</p> <p>No construction work is to be undertaken on Sundays and public holidays except:</p> <ul style="list-style-type: none"> any works which are not audible at any nearby residential property 	CM, PEM

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Noise and Vibration Management	
<ul style="list-style-type: none"> ○ the delivery of materials required outside these hours by the Police or other authorities for safety reasons; ○ emergency work to avoid the loss of lives, property and/or to prevent environmental harm; ○ any other work approved by DECCW or allowed through the EPL 	
Blasting locations	
<p>As identified in the Blast Management Plan:</p> <ul style="list-style-type: none"> • Side Cut between 330 and 3400 • Cut between 3410 and 3870 • Cut between 9250 and 9770 • Cut between 11370 and 11470 	
Blast impact mitigation	
<p>Blasting Monday to Friday 10am-3pm Saturday 10am-1pm <u>ONLY ONE BLAST PER DAY</u></p>	CM, PEM
Conduct blasting trials if blasting is to be used. Results from the trials will be used to determine site-specific blast designs and performance criteria as per the Blast Management Strategy.	CM, PEM
Undertake pre-construction/blast dilapidation surveys at identified nearby residences within 200 metres of construction works.	CM, PEM
Give a minimum of 48 hours notice to occupants located within 500 metres of any blasting together with a schedule of blasting times to affected residences. Include in the notice the schedule of blast time(s) and a telephone number and contact name.	CRM
Noise and Vibration Monitoring	
Monitoring of noise and vibration sensitive receivers as per Blast Management Plan, Table 4-1.	PEM
Measure environmental noise at representative and potentially affected nearest noise sensitive receivers, within fourteen days of the commencement of construction works and every month thereafter. Monitor airborne noise using a calibrated sound level meter. Compare results against predicted noise levels in the CNVIS.	PEM
Monitor saw cutting activities, using the methodology employed for monthly noise monitoring. Monitoring duration will be 15 minutes for evening and night time works and 1 minute for sleep disturbance monitoring.	PEM, SE
Undertake vibration measurements in response to received complaints and where construction activities with a potential to cause vibration related impacts are identified.	PEM
Monitor vibration levels using a tri-axial vibration monitoring system and compare against the vibration targets identified.	PEM
Monitor all blasts near potentially affected residents using a sound logger for sound pressure levels and peak particle velocity. Results to be compared against EPA licence limits.	PEM, SE

Waste Management	
Sub Plan ref: Waste Management and Reuse Plan	
Objective: To implement reuse and recycling programs where practicable for waste generated from the project activities.	
Performance Criteria: Refer to Waste and Reuse subplan for performance criteria and specific targets for each waste types..	
Mitigation Measures	Responsibility
Provide site personnel with induction in waste reuse, recycling, disposal and any special storage or disposal arrangements (e.g. hazardous wastes, chemicals, waste oils/ acid sulfate soils/contaminated materials).	CM
Ensure waste containers have clear signage to identify the specific containers for waste segregation. Provide separate containers for aluminium, glass, plastic and cardboard recycling.	SE
Keep lids on waste bins overnight to prevent accidental injury or death of wildlife. Ensure lids are kept on bins containing scrap food.	SS
Waste Reuse	
Recycle wood packaging, pallets and wood used for formwork, scrap metal and cardboard boxes, plastic wrapping and recyclable domestic waste resulting from project activities.	SS, SE, CM
All excavated spoil, topsoil and mulch will be stockpiled on site for later reuse. Spoil will be reused on site as part of works where possible to avoid double handling. Refer to Earthworks and Materials Handling Plan.	SE, CM
Ensure empty fuel, lubricant and chemical containers are stored for collection by a drum recycler for cleaning and reuse.	SE, CM
Waste Recycling	
Provide waste bins at the work site, site offices and compound in convenient locations for segregation of recyclable materials.	CM
Waste Disposal	
Provide rubbish skips in appropriate locations on site and ensure a contractor is commissioned to regularly remove/empty the bins. All bin removal/clearance will be undertaken within site boundaries.	SCM
Dispose of all non-hazardous waste that cannot be recycled/ reused for disposal to approved landfill. Contact Environmental Staff for the nearest local landfill sites.	SE, CM
Dispose of all hazardous or contaminated wastes materials at approved disposal facilities. Contact Environmental Staff prior to disposal for advice regarding disposal methods, handling, etc.	CM
All waste transporters are to be appropriately licensed to carry the materials to licensed waste facilities.	CM
All concrete pump wastewater collected in washout bays is to be recycled on site where possible or appropriately disposed.	CM
Do not bury any waste unless agreed with local council or DECCW.	
Monitoring	
Records of waste disposal and recycling (quantities, destination) will be tracked (docket system) and reported monthly.	PEM
Monitor waste management and recycling practices at the worksite weekly. Commence daily monitoring during hardstand removal.	PEM

Flora and Fauna Management

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Flora and Fauna Management	
Sub Plan ref: Flora and Fauna Management Plan	
CEMP Objective: To protect vegetation and fauna within the construction zone	
CEMP Performance Criteria: <ul style="list-style-type: none"> The construction boundaries are clearly demarcated. No long-term impacts on trees, plants and other vegetation outside the construction zone. No harm to fauna Minimal removal of vegetation and related disturbance to threatened species and endangered ecological communities from construction activities. No disturbance to flora and fauna outside the proposed construction footprint and associated access tracks and site compounds. No increase in distribution of weeds currently existing within the project areas. No new weeds introduced to the project areas. No net loss of significant habitat resources including hollow logs and tree nesting hollows, with materials cleared from the construction area re-used in adjacent areas where possible. 	
Mitigation Measures	Responsibility
Vegetation Protection and Management	
No dumping of fill or rubbish into remnant bushland.	SS, SE
Ensure all site employees remain within the site construction boundaries, including mainline formation, site compounds, and other approved ancillary areas (e.g. batch plant, approved access tracks).	SS, CM
Maintain erosion and sediment controls during construction until revegetation works are well established (at least 70% of exposed areas stabilised).	SS, SE
Ensure all soil or fill introduced does not contain noxious weed material.	SS, SE
Site Fencing	
Ensure no-go zone fencing, barriers and wildlife exclusion fencing are installed to prevent construction and access track encroachment into bushland areas and sensitive environments and neighbouring properties as per the Environmental Constraints Map, Attachment C.	SS, SE
Pre Site Clearing	
Prior to any clearing and grubbing works ensure the pre-clearing surveys as per the Pre-clearing Checklist has been approved by the PEM for each relevant compound site and access tracks.	CM, PEM
Prior to any clearing and grubbing works ensure a Ground Disturbance Checklist is completed following Pre-clearing Checklist approval. (FFMP 5.2.4.3 & s7)	SS
Site Clearing	
Undertake clearing, topsoil removal, mulching and grubbing as per the Clearing and Topsoil Management CMS . <i>This procedure will include the requirement for a qualified ecologist to mark protected vegetation as per CoA 57. It will also include a requirement to relocate fauna, mulch and stockpile cleared vegetation, retain fallen logs and treat weeds.</i>	SS, SE
Retain native vegetation logs for habitat reestablishment and remainder mulched for rehabilitation works.	SS, SE
Do not undertake clearing without the supervision of the Project Ecologist and/or Project Environmental staff.	SS, PEM
Weed Infestation Management	
Weed vegetation is to be stockpiled for appropriate treatment or removal to waste facility. Control weeds that are located in the construction site in accordance with the Weed Management Strategy as contained in the CEMP, Flora and Fauna subplan prior to site establishment works to prevent spread during the project construction phase. Burning of weed vegetation will require a permit under the Rural Fires Act 1997.	SS, SE
Ensure contracted persons undertaking pesticide treatment of weeds are registered with	PEM,SE

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Flora and Fauna Management	
DECCW and a Pesticide Use Notification Plan is prepared and DECCW notified as per the Pesticide Act 1999.	
During site establishment and initial earthworks at construction compounds, ensure any weed infested topsoil, including topsoil from agricultural areas is separated from weed free topsoil and is reused where possible by burial over .5m depth or disposed of at an EPA waste facility.	SS, SE
Maintain records of each topsoil stockpile to ensure they are only used in appropriate rehabilitation locations.	SE
Washdown Facilities	
Ensure all construction vehicles and machinery moving from weed infested areas to native vegetation through a construction corridor are washed down, inspected and passed as clean to prevent the spread of weed propagules. As some construction compounds neighbour pasture land, until a sterile construction corridor is established ensure this protocol is implemented.	SS, SE
Locate washdown facilities at the interface between weed infested areas and native vegetation until a sterile construction corridor is established.	SE, CM
Fauna Management	
Install fauna mitigation structures in accordance with the Flora and Fauna subplan Appendix C and Section 5, Management Measures and Mitigation Strategies.	CM, PEM
Habitat trees identified in the flora and fauna subplan are to be managed in accordance with the Clearing and Topsoil Management CMS.	CM
Contact Native Animal Trust Fund for the relocation of fauna that move into site compounds and present a hazard or danger to site staff or equipment, such as possums and snakes. As all native fauna are protect by the NPW Act, any injury or death of native fauna could result in fines and prison sentences. Ensure site induction include fauna management this measure.	SE, PEM
Prevent accidental injury or death of wildlife with the inspection of equipment and machinery left overnight and skip bins without lids before removal from site.	SS, SE
Threatened Species Management	
Ensure site staff induction includes the location and protection measures for flora and fauna, as per the Environmental Constraints Map, C.	CM, PEM
Construction activities are to cease immediately if, during the course of construction (including vegetation clearing), any threatened flora and fauna species are identified. Project Ecologist and DECCW are to be consulted.	SS, PEM
<p>Contact the Project Ecologist and appropriate fauna rescue organisations when native fauna is found on site, needs to be removed or is injured. Keep contact details for the Project Ecologist and appropriate fauna rescue organisations are on-hand within the construction site. Contact numbers for fauna rescue organisations include:</p> <ul style="list-style-type: none"> ○ Native Animal Trust Fund – Wildlife Rescue Service – 0418 628 483 ○ Wires - 1300 094 737 ○ Wildlife Aid Rescue – Hunter Valley - 04 4766 7737 	SS, SE
Progressive Site Rehabilitation	
Undertake progressive site rehabilitation and mitigation procedures as detailed in the Landscape Management Plan (prepared by a qualified rehabilitation specialist).	CM
Flora and Fauna Monitoring	
Monitor the adequacy of the exclusion fencing, the use of underpasses, extent of road kills and rehabilitation of injured wildlife and wildlife utilisation of roadside wildlife corridors in accordance with the Landscape Management Plan.	PEM

Soil and Water Management	
Sub Plan ref: Soil and Water Management Plan	
CEMP Objective: <ul style="list-style-type: none"> Minimise the impact of erosion and sedimentation from construction activities Ensure all sediment and erosion controls are implemented as per the DECCW Blue Book and the RTA's "Guidelines for the Control of Erosion and Sedimentation in Roadworks" Ensure necessary controls are implemented in key sensitive sites, such as DECCW estate and EECs CEMP Performance Criteria: <ul style="list-style-type: none"> DECCW water quality discharge criteria for all design storm are met Ensure that there are no pollution incidents causing environmental harm Maintain background water quality levels in surrounding waterways and aquatic habitats Control the impact of erosion and sedimentation from earthworks and other construction activities by implementing effective erosion and sedimentation control measures Prevent pollution by containing all fuel and other chemical spills and by implementing effective control measure 	
Water Quality Monitoring Locations	Location
Minmi Creek (MC)	0.510km
Blue Gum Creek (BGC)	2.590km
Surveyors Creek 1st Occurrence (SC1OC)	4.400km
Surveyors Creek 2nd Occurrence (SC2OC)	5.600km
Surveyors Creek 3rd Occurrence (SC3OC)	10.400km
Wallis Creek (WC1)	10.490km
Mitigation Measures	Responsibility
Re-schedule works that may lead to erosion and sedimentation when the daily weather report received for the project forecasts rainfall events.	CM
Pre-clearing	
Ensure the Erosion and Sediment Control Plan for construction compounds is certified by the Project Soil Conservationist.	PEM
Install erosion and sediment controls prior to any land disturbance in accordance with the Progressive Erosion and Sediment Control Plan developed for each defined work site.	SS, SE
Maintain vegetation in and adjacent to drainage lines to improve the quality of runoff before entering waterway and to prevent erosion.	SE
Clearing	
Maintain soil surface cover with methods including use of the cut stump to minimise soil exposure to erosion.	CM
Remove site vegetation for re-use/sale, or tub ground and either stockpiled (& managed to become compost for revegetation purposes) or windrowed to form sediment retention berms.	SE, CM
During clearing ensure groundcover/grasses and topsoil are retained in order to capture the runoff infiltration capacity of the groundcover for as long as possible, and to minimise topsoil runoff.	SE
Keep topsoil in areas not being excavated to prevent exposure of the subsoil during clearing	SE

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Soil and Water Management	
operations.	
Earthworks	
Protect topsoil stored for construction compound establishment from water and wind erosion by seeding with a sterile cover crop or by covering with geo-textile fabric until required	SE
Stabilise road batters in areas of high erosion hazard using a sterile cover crop.	SE
Do not located plant or operations within 20m of waterways unless for the purposes of waterway crossing construction.	SS, SE
Undertake progressive revegetation of disturbed areas.	CM, PEM
Delineate clearing limits to confine construction activities within the necessary construction area(s).	SE, CM
Maintain control measures until the site is stable and 70% soil surface cover has been achieved. Once the project site has been stabilised, temporary sediment controls can be removed.	CM, SE
Ensure wheels, tracks and body surfaces of plant and vehicles leaving the site are free of mud or sediment to minimise the potential for mud tracking on public roads.	SS
Use road sweepers if conventional measures such as rumble grids to not prevent mud tracking on public roads.	SS, SE
Reuse water collected in trenches and sedimentation basins where possible. When not possible treat water before discharge as per the Dewatering Procedure.	SS, SE
Undertake all dewatering procedures to safeguard groundwater as per the Dewatering Procedure.	SS, SE
Sediment Basins	
Install and manage sediment basins in accordance with the Sediment Basin Procedure.	SE
Stockpiling	
Place material stockpiles, construction buildings and other infrastructure only in cleared areas, typically in the road corridor or site compounds, adequately distant from sediment fencing that is installed down slope to prevent loss.	SE
Have all stockpiles that are predicted to be stored for longer than 10 weeks, covered or seeded with a sterile seed crop. Topsoil should be covered or have seeded with cover crop within 2 weeks.	SE
Do not undertake stripping of topsoil and stockpiling activities during periods of wet weather.	SS, SE
Do not place stockpiled materials within 5m of retained trees, within the drip line, over root systems or where overhead tree canopies could be damaged by machinery or trucks. Avoid where possible, stockpiling near waterways or drainage line, near properties or flood prone areas.	SS, SE
Ensure topsoil stockpiles do not exceed 2.5m in height and maintained to prevent the growth of weeds.	SS, SE
Creek crossings	
Ensure approval from NSW Fisheries and DoP have been granted before construction of any earthen platforms or placement of fill material over creeks.	PEM
Minimise intrusion into and impacts on the creek banks and river banks, sensitive environments and riparian zones. Protect creek diversions from erosion. Maintain vegetation through natural drainage lines to creeks where possible to prevent water quality impacts.	SE, CM
Time clearing activities near creek just prior to commencement of works and install erosion and sediment controls and drainage infrastructure as per the Erosion and Sediment Control Plan for the creek crossing.	CM
Vehicle Movements	
Conduct truck wash downs and cement truck washouts in approved areas only.	SS

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Soil and Water Management	
Use recovered water from construction works where possible for vehicle and equipment washdown and dust suppression.	SE, CM
Store all excess concrete and waste materials in bunded areas prior to reuse or disposal.	SS, SE
Designate and mark transport routes across undisturbed portions of the site to ensure minimal unnecessary vegetation disturbance.	SE
Cover all spoil during transportation on public roads.	SS, SE
Washout of concrete mixers and pump trucks only at designated wash-out locations on-site.	SS
Visually assess waste water captured in storage bunds for contamination prior to being released. Remove hydrocarbon contamination using appropriate absorbent materials.	SE, EM
Locate washdown areas for equipment in bunded areas away from watercourses and wetlands.	CM
Ensure concrete washout areas and pits are adequately sized, located away from drainage lines and maintained regularly.	CM
Spill Management	
Manage fuels and spills in accordance with Refuelling and Liquid Storage Protocol' (HEA-WP-GL-ENV-03-00-00)	SE, CM
Undertake refuelling and servicing of plant and equipment away from sensitive areas and ensure they carry or have ready access to a suitable spill kit.	SS, SE
Provide hydrocarbon and chemical spill kits for minor spills and leaks, including floatable booms for deployment to nearby watercourses as appropriate and train relevant personnel in their use.	CM
Report all hydrocarbon and chemical spills, cleaned up and dispose any contaminated waste lawfully.	SS, SE, CM
Maintain plant and equipped in accordance with OEM requirements to minimise the risk of breakdown and spills.	SS, SE
Ensure adequate controls are installed for oil changes on site, such as drip trays and spill control materials to prevent spillage.	SS, SE
For all mitigation measures for waterways crossing refer to the Construction Method Statement, <i>Temporary Waterway Crossings</i> .	SE
Dangerous Goods Management	
Store bulk hydrocarbons and chemicals in bunded areas and/or self bunded tanks and only small quantities of hydrocarbons and chemicals on bunded pallets.	SE
Store all dangerous goods away from marked environmentally sensitive areas, including all surface water features.	SE, CM
Rehabilitation and Landscaping	
For all rehabilitation of construction compounds, refer to Construction Method Statement: <i>Site Stabilisation and Rehabilitation Works</i> and the project Landscape Management Plan.	CM
Inspections	
Daily informal visual checks of all erosion and sedimentation devices to ensure that controls have been provided where required and/or are functioning correctly.	SS, SE
Daily environmental inspections of all erosion and sedimentation devices and rainfall depths.	PEM
Weekly inspections and completion of environmental checklists: <ul style="list-style-type: none"> Check that controls are being maintained in an efficient condition; Check that controls meet the requirements of any relevant approval and/or licence conditions; and inspections to inform the update of PESCPs and to identify where new controls are required 	PEM
Fortnightly joint inspections with the Alliance Soil Conservationist , RTA client representatives and Project EMR during clearing and earthworks phases.	CM, PEM
Monthly joint inspections with regulatory agencies representatives, project EMR, relevant	CM, PEM

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Soil and Water Management	
site staff, RTA client representatives and Soil Conservationist.	
Annual reporting to DECCW on compliance with EPL conditions.	PEM
Inspections following significant rainfall by the Project Engineer, Superintendent and Environmental Officer.	SE, PEM
Monitoring and Reporting	
For all monitoring and reporting regarding the soil and water impacts of access track across waterways refer to the relevant Construction Method Statement: <i>Bridge structures over Wallis Creek and Surveyor Creek.</i> <i>Bridge Structures over Minmi Creek</i> <i>Construction across the Kurri Kurri Sand Swamp Woodland</i>	PEM
Obtain daily weather forecasts to guide works undertaken on site.	PEM

Indigenous Heritage Management	
Sub Plan ref: Indigenous Heritage Management Plan	
<p>Objective: To protect any identified heritage items where they are to be preserved. To ensure correct protocols are followed where unidentified items are discovered.</p> <p>Performance Criteria: No damage to any known indigenous heritage items. Any heritage items inadvertently encountered during construction are protected in accordance with NSW legislative requirements.</p>	
Site specific mitigation	ECMS
The following sites were identified in the Indigenous Heritage Management Plan (IHMP) as having Aboriginal significance and specific mitigations contained in Appendix A of the IHMP will be included in site specific ECMS. Refer also to the Environmental Constraints Map, Attachment C and .	
Minmi Creek Stone Arrangement Sites (ECP –map 001) Red Zone 4	7.F3 Inter-interchange
Seahampton 1 Grinding Grooves (ECP –map 0001) Purple Zone 3	7.F3 Inter-interchange
Seahampton 2 Grinding Grooves (ECP –map 0001) Purple Zone 2	7.F3 Inter-interchange
Aboriginal Pathway Stockrington Road (ECP –map 0002) Yellow Zone 6	11. Viaducts
Blue Gum Creek - cultural area (ECP –map 0003) Yellow Zone 8	11. Viaducts
Blue Gum Creek 5 Grinding Grooves (ECP –map 0003) Purple Zone 10	1. General Construction / 11. Viaducts
Blue Gum Creek Grinding Grooves (a) (ECP –map 0003) Purple Zone 10	1. General Construction / 11. Viaducts
Blue Gum Creek Grinding Grooves (b) (ECP –map 0003) Purple Zone 10	1. General Construction / 11. Viaducts
Wallis Creek RTA 6 (ECP –map 0008) Blue Zone 12	1. General Construction
Wallis Creek RTA 5 (ECP –map 0009) Purple Zone 14	1. General Construction
Wallis Creek RTA 3 Grinding Grooves (ECP –map 0009) Purple Zone 14	1. General Construction
Wallis Creek RTA 2 (ECP –map 0002) Blue Zone 15	1. General Construction
Mitigation Measures	Responsibility
Pre-construction	
Brief all Contractors on the provisions of the National Parks and Wildlife Act in relation to Aboriginal objects/items, location of no-go zones and the protocol for the discovery of previously unidentified Aboriginal objects prior to commencement of working on the site.	PEM
Construction Works	
Undertake excavations in accordance with Section 87/90 Permit requirements (including those below) including the presence of a qualified archaeologist and a representative from	CM,SS

Responsibility: Community Relations Manager (CRM), Project Environmental Manager (PEM), Project Field Construction Manager (CM), Site Engineer (SE), Site Supervisor (SS)

Indigenous Heritage Management	
the relevant LALC.	
If suspected Aboriginal sites or relics are identified during construction works then all work that may impact on that area shall cease immediately and the Protocols in Sections 5.4 and 5.5 of the Indigenous Heritage Management Sub-Plan implemented. If you don't know these protocols, ask the Environment Manager.	SS
Monitoring	
Pre-Construction condition inspection to be undertaken by qualified archaeologist prior to works commencing near an Aboriginal heritage object.	PEM
Regularly monitor Aboriginal sites area to ensure mitigation measures are still in place - ie fences are still up and no damage has occurred.	PEM
During initial ground breaking a representative of the LALC will be invited to observe the works, to ensure no unidentified items are disturbed without the required approvals and recording.	PEM

Historical Heritage Management			
Sub Plan ref: Historical Heritage Management Plan (HEA-GL-PL-HHP-001)			
Objective: To minimise disturbance and avoid damage to any identified historical heritage items during construction.			
Performance Criteria: Heritage items are protected during construction in accordance with NSW legislative requirements.			
Site specific mitigation			
Chainage	Site name/item	Coordinate (MGA)	Relevant ECMS
235 to 415 metres	Minmi Creek - Fan shaft/vent	3,688,826,360,309	F3 Interchange
235 to 415 metres	Minmi Creek – Weir 1	3,688,506,360,305	F3 Interchange
235 to 415 metres	Minmi Creek – Weir 2	3,688,356,360,356	F3 Interchange
235 to 415 metres	Minmi Creek – Stone Wall	3,688,506,360,274	F3 Interchange
2365 to 2480 metres	Richmond Vale Railway – Rail Tunnel 134 (No 1 Tunnel) and cutting	366926, 6361146	Viaducts & General Construction
2590 to 2710 metres	Burrenjam Dam	366765, 6361170	Viaducts*
2795 metres	Jewboy Bushrangers Cave	366564.2, 6361222.8	Viaducts*
3560 to 3850 metres	Richmond Vale Railway – Rail Tunnel 139 (No 2 Tunnel)	365629, 6361815	General Construction**
10330 metres	Old Timber Church, 874 Buchanan Road, Buchanan	362316, 6367112	General Construction**
Mitigation Measures			Responsibility
Pre-construction			
Provide personnel and contractors site induction on the requirements of the Heritage Act 1977 and heritage site identification/ protection.			PEM
Known heritage items identified on the constraints map will be fenced with high visibility para-webbing or other highly visible barricading around the extent of the item.			CM
Appropriate signage to the fenced area will be erected to note that the item/s is/are a historical heritage item and is protected by the provisions of the Heritage Act 1977 (NSW) and that any potential impact is an offence.			CM,SE
Construction Works			
Install appropriate erosion and sedimentation controls around/adjacent to heritage items as required			SE
Heavy earth moving equipment must not use the Richmond Vale Railway formation for access or cause any disturbance to surface features.			CM,SS
All work will cease within the immediate vicinity of any suspected Non-Indigenous heritage items identified during construction work and the Environment Manager notified and the Contingency Protocol will be implemented.			SS
Monitoring			
Monitoring of these items by a qualified vibration consultant and/or structural engineer will be undertaken during construction, if they are deemed at risk from the potential impacts from vibration.			PEM
A qualified male archaeologist will monitor any vegetation and soil clearance in the Minmi Creek site area to reveal the extent of Weir 1, Weir 2 and stone wall to be fenced.			PEM