



Operational Environmental Management Plan

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Document Control

Accessing the Plan and other Documents

The Operations and Maintenance (O&M) Manager, or his delegate, will be responsible for maintaining, reviewing and updating the plan. The Integrated Contracts Management System Manager (ICMS) will be responsible for distribution of all controlled (electronic) versions of this Plan, both internally and externally.

Note:

- one controlled electronic copy will be transmitted to the NSW Roads & Maritime Services (RMS)
- all other copies are considered uncontrolled

Amendments

Each revision of the Plan will be distributed to all registered copyholders with an instruction that the superseded copy be destroyed. The updated revision number shall be noted at the bottom of each page and the name of the document in the header.

Recent revision changes will be identified and listed on the front page of any communication update. When amendments occur, the entire document will be reissued with revision number updated accordingly.

The M5 East O&M Manager will approve amendments by approving for publication within Our Way as Content Manager.

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1. Project Description

1.1 Background

In December 1997 Roads and Maritime Services (RMS), formally known as the Roads & Traffic Authority (RTA), was given planning approval to proceed with the construction of the M5 East in line with 150 Planning Minister's Conditions of Approval.

In December 2001, the M5 East was opened to traffic.

The motorway was constructed to significantly improve access between south western Sydney, the city, and the major industrial and commercial areas of South Sydney. Since the completion of construction, the motorway has reduced traffic congestion in residential areas, improved traffic flow, and removed heavy vehicles from key local roads - with safety, noise and air pollution benefits for the community.

The M5 East is a 10km motorway-freeway connecting the M5 South West Motorway with General Holmes Drive and the Eastern Distributor. The M5 East provides two lanes of carriageway in each direction and includes twin 4.4km tunnels (westbound and eastbound) and a 550m tunnel under the Cooks River (CRX). The main motorway tunnel is serviced by a ventilation tunnel of approximately 800m in length, connecting to an exhaust stack at Turrella.

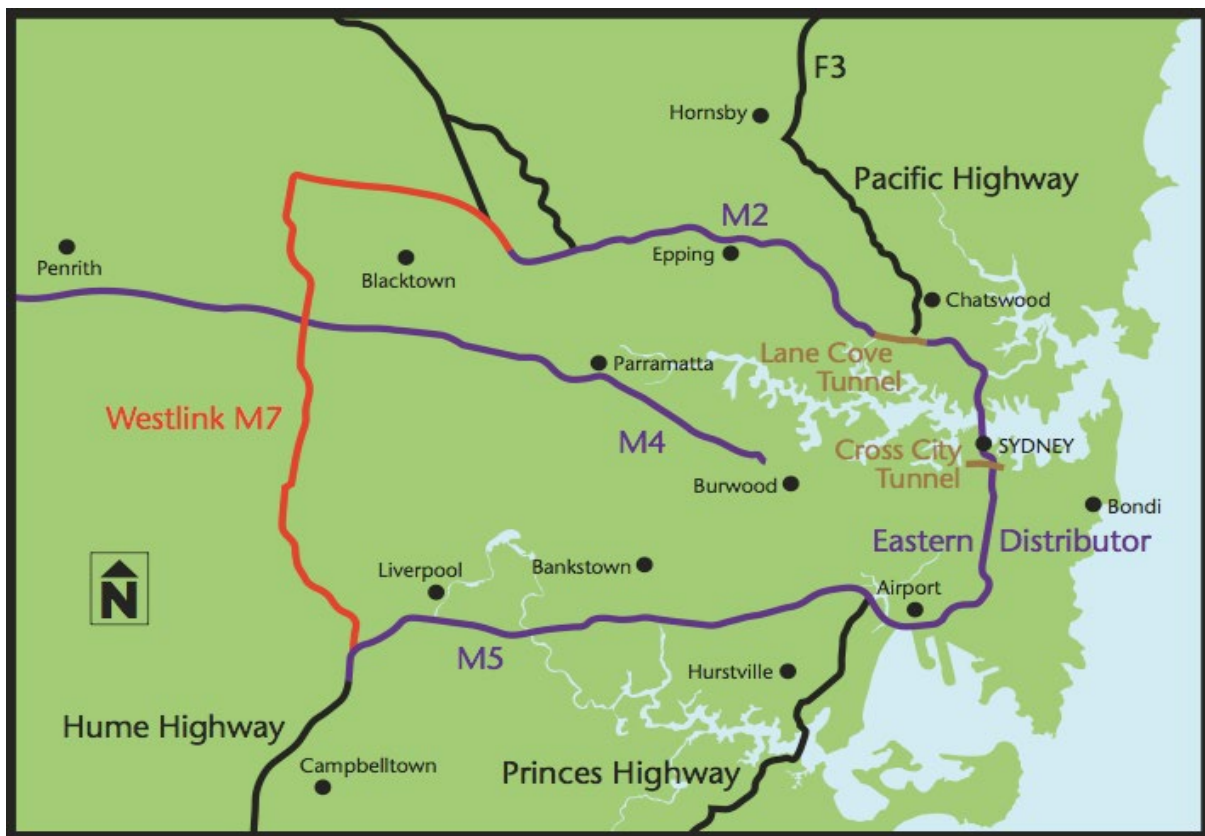


Figure 1: Sydney motorway network

The Motorway Control Centre is located adjacent to the Marsh Street intersection at Arncliffe. The motorway is flanked in sections, by public park areas including shared pathways. Groundwater management is treated through the project's own water treatment plant and surface water runoff is treated through ten water quality ponds which are positioned along the boundary of the open motorway.

1.2 Scope of Works

The scope of works associated with the Contract for the M5 East is as follows:

- **Management Services:** the overall management of the operation and maintenance of the M5 East and all Assets. The Management Services are more particularly described in Section 3 of the SSR Exhibit 1 Service Scope and Requirements (SSR).
- **Operation Services:** the use, operation and control of the M5 East and all Assets. The Operation Services are more particularly described in Section 4 of the SSR Exhibit 1.
- **Maintenance Services:** the condition and performance of the M5 East, including the condition of the Assets and Maintenance Site. The Maintenance Services are more particularly described in section 5 of the SSR Exhibit 1.
- **Handover Services:** to be provided during the Handover Period. Handover Services include all activities and work necessary to enable the safe and continuous operation of the M5 East during and immediately after the Handover Period. The Handover Services are more particularly described in section 2.4 of the SSR Exhibit 1.
- **Additional Services:** are in addition to the Services listed above, which the Service Provider is directed by RMS to carry out in accordance with the Contract. The Additional Services are more particularly described in section 2.5 of the SSR Exhibit 1.

2. Introduction

2.1 Context

LS NewCo (NEWCO) considers excellence in environmental management to be critical to the success of a contract. NEWCO has implemented proven best practice environmental management processes that are applied to all business endeavours and operations.

The Operational Environmental Management Plan (OEMP) has been developed to support the execution of the M5 East Project (D150).

All Plans for this Contract (№ 10.2137.1882) have been developed in the context of the M5 East Management Plan, the Quality Management Plan and the Risk & Opportunity Management Plan. Primary linkages for this Plan are depicted in Figure 2 below.

Supporting procedures and processes are referenced throughout the Plan.

The OEMP is consistent with the following requirements ensuring compliance with the project requirements (as per SSR Section 3.9a):

- AS/NZS ISO 14001:2004 - Environmental management systems
- RMS QA Specification - Environmental Protection
- NSW Government - Environmental Management Systems Guidelines

The following sub-plans, which are an integral part of the OEMP, have been developed and are accessible via 'Our Way':

- Greenhouse & Energy Efficiency Management (GEEM) Plan
- Pollution Incident Response Management Plan (PIRMP)
- Sustainability Plan



Figure 2: M5 East management plan interface

2.2 Purpose

The OEMP has been developed to address and manage the environmental aspects and impacts related to the operation and maintenance of the M5 East asset. It is a practical document designed for the use by operational personnel involved in environmental management. It is considered to be a working document that will be updated on a regular basis to reflect the changes in environmental management processes, policies, legislation,

and objectives and targets. This document will generate the processes and responsibilities necessary to facilitate effective environmental management for the delivery of services for the duration of the Contract.

It will achieve this through:

- Identification of environmental management processes and methodology to be used by the contract management team
- Mechanisms for managing the environment
- Assignment of responsibilities for implementing these processes

The OEMP will be made publicly available, in accordance with MCoA Condition 13.

All employees and subcontractors will be bound to comply with the requirements of this plan, as far as is applicable to the nature and scope of their work.

2.3 Plan Review

As part of the Contract commitment to continual improvement, the OEMP will be subject to scheduled performance reviews and audits. Other mandatory triggers for review of this Plan are indicated in Table 1 below:

Table 1: OEMP review

Action	By	Frequency
Scheduled Management Review	Eastern Region Environment Manager	Annually
Scheduled Audit (compliance)	Eastern Region Environment Manager (or Client)	Annually
Repetitive/major non-conformances	Operations and Maintenance Manager	On notification
Changes in legislation, standards, and requirements (directives) from Authorities	Environment and Community Manager	On notification
Environmental Impact Audit Report	Independent Auditor, Environment and Community Manager	On notification
Scheduled Management Review	Eastern Region Environment Manager	Annually

👉 Process: [Conduct management review](#)

2.4 OEMP Change Management Process

Minor modifications will be approved by the M5 East Environment & Community Manager and O&M Manager. RMS will be notified of any changes and provided with a revised copy.

Major amendments to the OEMP will be submitted to RMS for their review. Refer to Section 3.4 of this document for further details.

2.5 Handover

At the end of the contract a hand-over will commence with, RMS. As part of this handover the following environmental documentation will be provided to RMS:

- latest version of the EMP
- copies of monitoring reports
- copies of audit reports

2.6 Terms & Definitions

👉 Terms used in this Plan have been defined in Annexure 6 'Glossary'

3. Environmental Management Framework

3.1 NEWCO Environmental Management System

Operational and maintenance activities will be conducted under NEWCO Environmental Policy, which falls within our Core Purpose: “The Way We Operate”. This document provides a summary of our approach, and includes reference to our objectives for Quality, Safety & Health and Environment.

☞ Refer: [The Way We Operate](#)

☞ Refer: [The Green Book - Environment at LS NewCo](#)

The NEWCO Environmental Management System structure is modelled on accepted management system approaches and reflects the structure of ISO AS/NZS14001:2004. The associated Business Standard for environmental management must be maintained as a minimum requirement.

☞ Process: [Environment management](#)

The Group Environmental Team’s role is to provide and continue to develop support tools to help the Divisions and Projects manage the environment in a professional and systematic way. All systems are designed to ensure compliance through the implementation of Group SHE Business Standards.

The Services Division, in line with and linked to the Group framework, has developed and implemented its own Environmental Management System relevant to its activities. This ensures Group Environmental Business Standards are met while at the same time allowing the Services Division to develop a system meeting their specific needs.



Figure 3: NEWCO document hierarchy

3.2 Project Management System

3.2.1 [M5 East EMS](#)

M5 East’s environmental management system (EMS) is a structured approach to managing the environmental impacts of activities associated with operation and maintenance activities. The Project EMS is contained within ‘Our Way’ (refer Project D150 - M5 East).

All NEWCO projects develop environmental plans as required by the Group Environmental Management System. Various supporting documentation is developed in order to manage environmental outcomes (refer Fig 4).

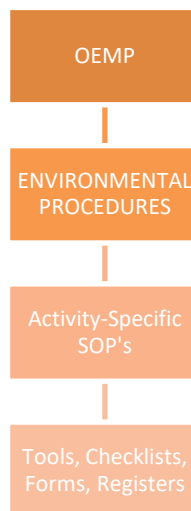


Figure 4: M5 East EMS document hierarchy

☞ Process: [Develop environmental management plan](#)

3.2.2 Environmental Procedures & Standard Operating Procedures

In addition to the OEMP, M5 East has developed and will implement a set of environmental procedures and Standard Operating Procedures (SOP) to provide further guidance for managing certain environmental tasks and to ensure consistency in approach and quality of outcome.

The SOP's are the main site documents used by M5 East to identify and manage safety and environmental risks associated with all construction activities. SOP's are required for every significant action undertaken by project personnel on site and are developed prior to any activities taking place.

Environmental procedures/SOP prepared for high risk and sensitive area activities will be forwarded to RMS and the appropriate regulatory agency for review prior to commencement of the activity. Sensitive areas and high risk activities are recorded in the Environmental Risk Register as high risk (refer to risks registered in ARM). SOP's have been developed for the M5 East project and are referenced throughout the document.

SOP will be approved by the Environment & Community Manager prior to works being undertaken. The requirement for approval by environmental personnel provides the opportunity to ensure that relevant controls required by the OEMP, procedures and relevant legislation have been considered and communicated to all personnel undertaking the associated tasks.

All M5 East personnel undertaking a task governed by a SOP will have signed on that they have read and understood their requirements prior to commencing work.

Regular monitoring, inspecting and auditing against compliance with the SOP will be undertaken by management, quality, safety and environmental personnel to ensure that all controls are being followed and non-conformances are recorded and actioned.

☞ Process: [Create Standard Operating Procedure \(SOP\)](#)

☞ Refer Annexure 4 'M5 East Environmental Procedures'

3.2.3 Tools, Checklists, Forms & Registers

M5 East has developed and utilised a number of tools (e.g. guidance notes and instructions), checklists, forms and registers to assist in the implementation of processes described in the OEMP, SOP's and procedures. These types of documents will be further developed and continually improved to ensure consistency in approach and quality of outcome.

☞ Refer Annexure 5 'M5 East Environmental Tools'

3.3 Managing Environmental Risk

The process of identifying environmental aspects, related impacts at M5 East, and determining a risk ranking was undertaken as part of an initial environmental risk assessment workshop. This culminated in the development of the M5 East Aspects, Impacts & Environmental Risk Assessment Register, which is managed using an online tool called Active Risk Manager (ARM) - here risks are categorised and ranked in order of significance.

ARM provides the platform for the professional and detailed management of environmental risk. The use of ARM is mandated across all projects. Projects are created in ARM and setup to reflect the scope, objectives and work activities of the project. This enables project personnel to understand the potential environmental risks associated with their jobs, and the controls needed to ensure prevention of incidents.

The Environmental & Community Manager is the 'Risk Owner' for all environment related risks associated with the M5 East, and may delegate/allocate the management/control measures to other members of the M5 East Team for implementation. Where responsibilities have been allocated to specific personnel (via risk workshops and reviews) to control and/or manage environmental risks, these persons become risk 'Action Owners'.

Ongoing risk assessments will be conducted in line with review schedules and triggers identified in the M5 East Risk & Opportunity Plan.

Significant environmental aspects identified for the M5 East Project are presented in Table 2, including reference to where they are addressed in the OEMP.

Table 2: M5 East significant environmental aspects

Significant Environmental Aspect	Impact	OEMP Reference
Air quality reduction during tunnel operation and maintenance activities (i.e. traffic congestion, stack emissions, and traffic flow external to tunnel)	Concentration of air pollutants; nuisance dust generation; breach of MCoA Conditions; potential human health effects	Section 8.1
Noise generation during tunnel operation (i.e. ventilation fans) and maintenance activities (i.e. machinery operation)	Reduced amenity and disturbance to local sensitive receivers	Section 8.2
Flooding caused by significant rainfall events or deluge water (resulting from fire suppression activation)	Risk to traffic and possible lane/motorway closure	Section 8.3
Run-off, spills and uncontrolled discharges within the asset boundary	Pollution of waterways, and potential for harm to aquatic flora/fauna	Section 8.4
Long term effects of tunnel excavation, and groundwater inflow into tunnel	Adverse effect on the natural and/or built environment and groundwater quality	Section 8.5
Soil erosion caused by scour from poorly stabilized areas or excavations, and sedimentation from rainfall run-off	Pollution of waterways, and potential for harm to aquatic flora/fauna; unnecessary waste generation	Section 8.6
Possible interaction with flora and fauna during operation and maintenance activities (e.g. plant and machinery, chemical use, storm-water run-off, fires)	Pollution of waterways, and potential for harm to aquatic flora/fauna	Sections 8.7 & 8.8
Mismanagement of contaminated soil, including failure to correctly classify (includes sediment removal from water containment ponds and tunnels)	Pollution of waterways; prosecution or fines	Section 8.9

Inefficient use of materials; incorrect disposal; litter; poor waste segregation	Pollution of waterways; prosecution or fines; increased disposal costs; reduced amenity	Section 8.11
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☞ Process: [Manage project risk and opportunity](#)

☞ Tool: [Active Risk Manager \(ARM\)](#)

3.4 Change Management

Proposed changes to the operation and maintenance of the M5 East Motorway will be assessed and documented in accordance with procedure ‘Manage SHE Change’ in order to identify and manage any consequences of the change. This will include an assessment of risk, and compliance with legal requirements. Changes may include:

- alteration of operations and maintenance schedule or scope of works;
- modification of work methods within approved scope;
- adjustment of environmental monitoring requirements;
- changes to asset boundaries; and
- changes in technology.

Changes to the OEMP will be approved by the O&M Manager or delegate, and RMS.

☞ Process: [Manage SHE Change](#)

3.5 Objectives & Targets

Objectives and targets have been set for environmental management and will be reviewed annually to enable continual improvement. Strategic objectives and targets are set bi-annually by NEWCO Corporate: these are configured by the O&M Manager, enabling objectives and targets to be addressed at site level.

Table 3: M5 East objectives and targets

Objective	Target	Measure	Responsibility
Eliminate the potential for incidents and systematically reduce all other infringements	No breaches or penalty infringement notices	Environmental incident frequency rate <0.2	O&M Manager
Improve waste management	Develop a site Waste Register: data to be collected on a monthly basis and new reduction targets to be implemented on a 6-monthly basis	Register developed, and full data set achieved	Environment & Community Manager
Drive environmental continual improvement and encourage innovation	At least 1 environmental/sustainability initiative to be generated on a quarterly basis	4 initiatives collected on the ‘Continuous Improvement Board’	Environment & Community Manager
Increase awareness of environmental aspects and impacts	Environmental issue/opportunity to be discussed at every monthly toolbox talk	Monthly toolbox talk records	Environment & Community Manager
GEEMIS Reporting	Monthly reporting greenhouse gas emissions generated, and emission reductions	GEEMIS register to be completed monthly	Environment & Community Manager
RMS Electricity Moderator	Alternative power solutions to be investigated and	1 proposal per quarter	Environment & Community Manager

M5 East Operational Environmental Management Plan (OEMP)

	implemented to reduce energy consumption		
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- ☞ Refer to the latest 'M5 East Business Plan' for current objectives and targets
- ☞ Process: [Set Environmental Objectives & Targets](#)
- ☞ Reference: [The Green Book - Environment at LS NewCo](#)

4. Legislative & Other Requirements

The M5 East Project operates according to a range of obligations prescribing performance requirements. This includes how obligations are captured and monitored for the duration of the Project, including relevancy to M5 East activities.

Operation and maintenance of M5 East requires reference to a considerable range of legislation, regulations and guidelines. Ongoing management of legislative and other requirements applicable during operation is as follows:

- Subscription to 'Envirolaw' - an online legal directory accessible via the NEWCO intranet 'Our Way'
- Changes in existing legislation communicated by the NEWCO Eastern Region Environment Manager

☞ Process: [Identify SHE legal and compliance requirements](#)

☞ Refer 'Annexure 2 - Applicable Legislation & Other Requirements'

☞ Refer 'M5 East Obligations Matrix'

4.1 Environmental Assessment & Project Approval

4.1.1 Minister's Conditions of Approval

Following a detailed Environmental Impact Assessment process (completed in accordance with the Environmental Planning and Assessment Act, 1979), the M5 East was approved by the Minister for Urban Affairs & Planning on 9th December 1997, subject to 150 Minister's Conditions of Approval (MCoA).

NOTE: the M5 East does not operate under an Environmental Protection Licence (EPL). The activities conducted at M5 East are regulated by State Environmental Planning Policy (Infrastructure) ISEPP 2007, under the Environmental Planning and Assessment Act 1979. An EPL is not required for M5 East as the activities are considered to have minimal impact on the environment, thus do not trigger Schedule 1 premises-based activities of the Protection of the Environment Operations (POEO) Act 1997.

☞ Refer 'Minister's Conditions of Approval for M5 East, including Supplementary Air Quality Conditions'

☞ Refer 'Minister's Modification Approval' (18 July 1997)

☞ Refer 'M5 East Obligations Matrix'

4.1.2 Environmental Assessment Process

In alignment with RMS procedure *Environmental assessment procedure for routine and minor works* (EIA-PO5-1), NEWCO are required to assess the potential environmental impact of routine and minor works projects carried out within the asset boundary at M5 East.

Routine and minor works are defined as being general maintenance and minor works activities of minimal or minor environmental impact. Under the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy* (Infrastructure) 2007 (ISEPP) environmental assessment must be carried out before conducting activities and development (including routine and minor works) depending on the nature, scale and impacts of the type of work involved.

For environmental assessment purposes, routine and minor works will generally fall under the EP&A Act and ISEPP within one (1) of the following categories:

- Works that are not considered *activities* or *development*;
- Works that are characterised as *exempt development*; or
- Some works that fall under Part 5 of the EP&A Act requiring a Minor Works Review of Environmental Factors (REF) to be undertaken.

Some routine and minor works also fall under the *Roads Act 1993*:

- Removal or trimming/pruning of trees and vegetation that is on or overhanging a public road (i.e. removal of a traffic hazard)

The process for when and how to undertake an environmental assessment is detailed in procedure Environmental Impact Assessment (M5E-ENV-24). This procedure includes details of M5 East's 'disturbed zones', an activity checklist for routine and minor works, and references to SOP's for activities conducted for these works.

☞ *Process: Environmental Impact Assessment (M5E-ENV-24)*

☞ *Refer: Environmental assessment procedure for routine and minor works (RMS, EIA-PO5-1)*

4.2 Client Requirements

The Client's requirements are tabulated as follows:

Table 4: Client environmental requirements

Document	Requirement	NEWCO Reference
Contract № 10.2137.1882 Part A, Clause 1.1(b)-(d) Exhibit 1 SSR, Clause 1.1(b)ix	The Service Provider must carry out the Services so that: <ul style="list-style-type: none"> • each Contract Objective is achieved; • no Environmental Event occurs; • the requirements of the Environmental Documents are at all times met (including the conditions of the Planning Minister's Approval specified in Appendix 5 to the SSR as the responsibility of the Service Provider) 	OEMP Section 3
Contract № 10.2137.1882 Exhibit 1 SSR, Clause 1.1(b)ix	Specific objectives are to: <ul style="list-style-type: none"> • Develop, implement and maintain effective management systems for...environment 	OEMP Section 2.1
Contract № 10.2137.1882 Appendix 30, Clause 3(a)	Separate Environmental Management Plans for the Services must be prepared in accordance with the Environmental Management Plan Guidelines in Appendix 4 and RTA Specification DCM	OEMP Section 2.1
Contract № 10.2137.1882 Appendix 30, Clause 3(b)(iv)	The Environmental Management Plans must contain, as a minimum: <ul style="list-style-type: none"> • management strategies for environmental compliance 	OEMP Section 3.3

☞ *Refer 'M5 East Obligations Matrix'*

4.3 Compliance

A comprehensive schedule of environmental inspections, auditing, monitoring and reporting is in place across the company, covering Group, Divisions and Projects. Compliance is also tracked on a regular basis through the M5 East Monthly Report and Quarterly Compliance Report (both reports required under the Contract). Compliance with the Minister's Conditions of Approval, amongst other obligations, are tracked using the M5 East Obligations Matrix.

☞ *Refer 'M5 East Obligations Matrix'*

4.3.1 Inspections

Environmental inspections are scheduled in Maximo (M5 East's Asset Management System), and conducted by the Environment & Community Manager (or delegate). Inspections are conducted as follows:

Table 5: Environmental inspections conducted at M5 East

Inspection Type	Frequency	Record
Site-wide Environmental Inspection	Monthly*	M5 East Environmental Inspection Record
Water Containment Pond Inspection	Monthly	Maximo Work Order (completed)

*typically coincides with M5 East’s regular maintenance shutdown

☞ Process: [Conduct workplace inspection](#)

4.3.2 Audits

The audit program provides assurance that our systems and related procedures are being implemented at every level of the organisation. Cintellate (NEWCO’s intranet-based SHE management tool) is used for recording all outcomes and actions from the auditing process.

Audits will be conducted according to the schedules developed as part of the M5 East Quality Plan and supported by the NEWCO Quality Management System. The audit program is managed by the Integrated Contracts Management System (ICMS) Manager.

☞ Process: [Develop and manage audit program](#)

☞ Process: [Audit types and frequencies](#)

☞ Process: [Manage Cintellate](#)

Internal Audits

Internal audits are scheduled and recorded in Cintellate, and are conducted by the NEWCO Eastern Region Environment Manager (or delegate) on an annual basis (as a minimum) due to the Project being regarded as low risk (i.e. activities, location and infrastructure type). Any actions resulting from internal audits are managed using Cintellate’s ‘Action Management’ function.

☞ Process: [Manage audit program and resources](#)

☞ Process: [Conduct project internal audits](#)

☞ Process: [Conduct SHE audits](#)

External Audits

External audits are carried out by various parties as follows:

Table 6: External audits carried out at M5 East

Audit	By	Frequency
ISO AS/NZS14001 Surveillance Audit or Recertification Audit	SGS Australia	As required
Environmental Impact Audit (RFT Environmental Requirements)	Independent	Annual
Community Based Air Quality Monitoring Station Technical Audit	Aurecon	Quarterly

☞ Refer Contract № 10.2137.1882, Clause 21

4.4 Nonconformance, Corrective & Preventative Action

All nonconformances and subsequent corrective/preventive actions are managed in accordance with the LS NewCo Quality Management System and the M5 East Quality Plan.

Nonconformances will be managed using the Cintellate system. Nonconformances may include system/process failures, exceedances of environmental limits/goals, and breaches of legislative and other obligations. Any corrective and preventative actions arising from audits, inspections, incidents and complaints will be registered, tracked and closed out using this tool.

The Environment & Community Manager is responsible for approving all remedial actions and ensuring the close-out of environmental nonconformances.

☞ Process: [Raise nonconformance report](#)

☞ Process: [Manage system nonconformance](#)

5. Implementation

5.1 Roles, Responsibilities & Authority

The establishment of environmental responsibilities and accountabilities for M5 East personnel ensures the Project is delivered in accordance with all legal and obligatory requirements and the NEWCO Environmental Management System, and that environmental best practice is applied for the duration of the Project.

The O&M Manager holds overall accountability for environmental management on M5 East and is ultimately responsible for environmental performance and ensuring that environmental management systems are established and implemented. Furthermore, all managers, staff and contractors have specific environmental responsibilities and accountabilities (refer Figure 5).

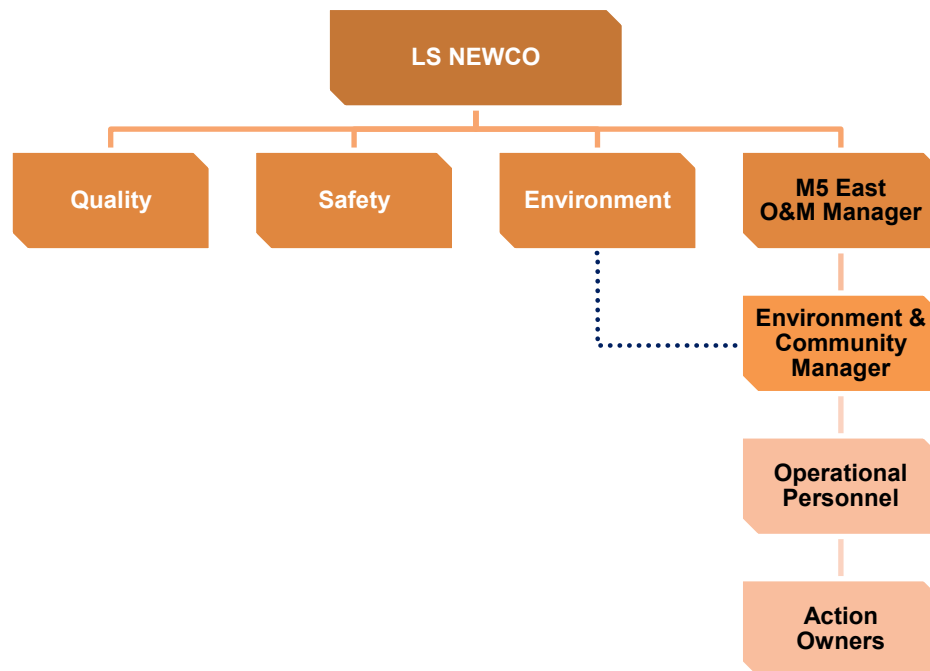


Figure 5: M5 East organisational structure

Individual responsibilities vary depending on the work performed and its potential impact on the environment. The M5 East management team is also supported by corporate and divisional environmental management resources.

- ☞ Refer 'Annexure 3 - Roles and Responsibilities'
- ☞ Refer 'Services Management Plan' Volume 4
- ☞ For more information on the competency requirements of various roles please refer to Human Resources Manual (Volume 2)
- ☞ Process: [Establish organisational structure](#)
- ☞ Process: [Maintain organisational charts](#)

5.2 Competence, Training & Awareness

5.2.1 Induct Personnel

Employees, including contractors, must complete a workplace induction prior to conducting any work/activities on site, which includes (but is not limited to) safety, environment, and community content.

The induction is an online format that is completed on the 'Permitted' system (accessed via 'Our Way'). Personnel cannot enter the site unless the induction assessment has been completed and passed. All visitors to site will be given a visitor specific induction.

Before attending the site and completing the site induction, all Personnel must show evidence of having undergone the training required in accordance with their trade and activities which meets the guidelines in the occupational health and safety legislation (general industry induction).

Copies of all required qualifications are uploaded onto the Permitted system.

5.2.2 Daily Task Prestart Briefings & Take 5

Daily Task Pre-start briefings and the Take 5 process is carried out at the start of every work day or shift to maximise the safety, health and environmental awareness of all employees and contractors through team participation in an analysis of the activities and tasks planned for the day or shift. It also includes the discussion and familiarisation with relevant Safety, Health & Environmental Work Method Statements (SOP) for the day/shift ahead.

These processes are designed to ensure that each person is informed, committed and recognises the importance of their role and contribution in ensuring all work is carried out in an environmentally sound manner.

Table 7: Toolbox talks held at M5 East

Session	Responsibility	Record
Daily Task Prestart Briefing	Team Leader	Daily Task Prestart form
Take 5	Each team member	Take 5 form

☞ Process: [Daily task prestart briefing](#)

☞ Process: [Take 5](#)

5.2.3 Task Observations

Tasks observation will be conducted as part of supervision and monitoring activities to monitor compliance with NEWCO SOP's and contractor SOP's, and as part of general inspection of the site.

The results of task observations will be used to inform continual improvement, i.e. any actions raised will be entered into Cintellate to enable monitoring through to closeout.

☞ Process: *Conduct task observation*

5.2.4 Toolbox Talks

Toolbox talks are scheduled on a regular basis (typically monthly) as an opportunity for communicating and discussing environmental management. At M5 East, two toolbox sessions are held as detailed in Table 8:

Table 8: Toolbox talks held at M5 East

Session	Frequency	Presenter
Shutdown Prestart Meeting	Monthly, each night of shutdown (i.e. 4 nights)	Environment & Community Manager (or delegate)
M5 East Toolbox Talk	Monthly	Environment & Community Manager

During toolbox talks, the opportunity will arise for employees (or contractors) to raise issues and promote discussion. All toolbox talks will be recorded using a Toolbox Talk Record.

☞ Process: [Conduct toolbox talks](#)

5.2.5 Environmental Awareness Training

Environmental awareness training is expected to be completed by all Managers and Supervisors at the M5 East. Environmental education and instruction will be incorporated into the M5 East Training Plan.

Content will include:

- Purpose and objectives of the OEMP
- Explanation of the NEWCO Environmental Policy
- Key environmental issues relating operations and maintenance activities and assets
- Staff responsibility and accountability to exercise duty of care, and due diligence
- Awareness of MCoA Conditions and requirements of any other environmental approvals
- Legislative requirements and other obligations
- Communications, including internal reporting and external consultation
- Inspections and auditing programs
- Incident response

Where appropriate, specialist environmental education will be provided to personnel with particular responsibilities in environmental management.

☞ *Tool: Environmental Awareness Training (PowerPoint presentation)*

☞ *Process: [Conduct training and assessment in the classroom](#)*

☞ *Process: [Attend training](#)*

☞ *Refer: [M5 East Training Plan](#)*

5.2.6 [Issue Alerts & Bulletins](#)

Within two weeks of a significant environmental incident (i.e. Level 1 or 2), the Environment & Community Manager will review the outcome of the initial investigation and identify whether communication and corrective action is required to prevent the incident recurring. If the Environment & Community Manager believes that the risk of recurrence exists, an Alert will be generated for distribution to all NEWCO projects (via the NEWCO Group Environmental Manager).

Based on the nature of the alert, the relevant manager shall communicate the Alert in the following manner:

- Through pre-start meetings and toolbox talks/meetings, inform all project personnel, including contractors, of its content
- Display the Alert on all noticeboards

The O&M Manager (or delegate) is required to communicate the Alert to all personnel via Pre-Start Briefings and Toolbox Talks. The O&M Manager (or delegate) will ensure that the Project team sign the Alert to indicate that they have been made aware of the issue.

Alerts received from external parties will be reviewed, and if deemed relevant to the project, they will be converted into the NEWCO Alert format and issued to the project.

Bulletins will be used to provide relevant information to all project personnel. This information can include, but is not limited to:

- Reiteration of best practices
- Changes to the workplace environment
- Updates to legislation
- In response to minor environmental incidents

Bulletins will be developed and issued by the Environment & Community Manager as deemed necessary.

☞ *Process: [Manage incidents](#)*

☞ *Process: [Issue alerts and bulletins](#)*

5.3 **Communication**

Under the Contract, communication processes for M5 East will occur as follows:

5.3.1 [Liaison with NSW EPA](#)

M5 East staff must be available to liaise with the RMS Representative, NSW EPA, and other authorities (if required), on a 24 hour basis. Those authorised to take immediate action as required by NSW EPA are:

- Operations & Maintenance Manager
- Environment & Community Manager

5.3.2 Community & Stakeholder Liaison

Appropriate communication and notification with key stakeholders is an essential element in establishing constructive communication channels to ensure the impact of potential or actual issues and incidents are prevented/minimised or dealt with efficiently and amicably.

Stakeholders have been identified as part of the Community Relations Plan and include residences nearby to M5 East, Government departments, authorities, various organisations and Local Government.

Processes for managing communication with the community and stakeholders have been developed through the Community Relations Plan. The community will be notified regarding the following:

- Scheduled maintenance activities (performed out-of-hours, 4 nights each month)
- Out-of-hours works
- Air quality
- Monitoring data
- Innovation and positive environmental outcomes

☞ *Refer: Community Relations Plan*

5.3.3 Complaints Management

The Environment & Community Manager will immediately advise RMS of any complaints that have the potential to be escalated to government representatives and/or the media.

Within one working day of receiving a complaint about any environmental issue, M5 East will submit a written report to the RMS detailing the complaint and the action taken to remedy the problem. A final report with proposed measures to prevent the occurrence of a similar incident will be submitted within 5 working days to RMS.

Communication feedback will be evaluated monthly as part of the reporting process in order to assess and adjust communication methods if required.

☞ *Refer: Community Relations Plan*

5.4 **Management of Subcontractors**

Subcontractors will be managed in accordance with procurement process set out in the Operations Management Plan. Included in the process is the measurement and monitoring of subcontractors' capability and capacity to manage the environment.

5.4.1 Subcontractor Selection

As part of the pre-selection process, sub-contractors will be required to provide details of their level of environmental awareness and their environmental performance. Subcontractors will be required to submit a Subcontractor Pack, which must address the relevant environmental issues relating to their work. Selection of subcontractors will be dependent on their past environmental performance and their commitment to compliance with the OEMP.

☞ *Process: [Evaluate, engage and review subcontractors](#)*

☞ *Process: [Select supplier/subcontractor](#)*

5.4.2 Subcontractor Inductions

All subcontractors are required to complete an online induction, in which M5 East-specific environmental management issues are addressed, and pass the required assessment. Subcontractors are not permitted on site unless the induction assessment has been passed. Subcontractors will also receive training in relevant procedures and other necessary requirements as applicable (i.e. to their activities).

During scheduled closure periods, all subcontractors involved are required to attend the nightly Toolbox Talk that addresses specific environmental issues relating to those works.

☞ *Process:* [Develop and deliver project inductions](#)

5.4.3 [Subcontractor Performance](#)

Subcontractor performance is assessed periodically through the environmental audit program and regular inspections. All subcontractors are audited against the OEMP and their SOP to ensure compliance with environmental management measures relevant to their activities/works. Subcontractors with a large scope of work, and those with a high environmental risk associated with their activities, will be audited sooner and more frequently than those that pose little environmental risk.

On every occasion a subcontractor attends site, they must submit their SOP through the 'Permitted' system. Through this, the NEWCO supervisor assesses their work and ensures that all job-specific environmental issues are addressed. Subcontractors are not permitted to enter site unless they have received an approval permit issued via Permitted.

☞ *Process:* [Evaluate, engage and review subcontractors](#)

5.5 [Manage Incidents](#)

For all incidents the following steps are to be taken:

- Immediate notification of Supervisor and Environment & Community Manager who will notify the O&M Manager and the Branch Environmental Manager;
- Undertake all reasonable actions to contain incident (if possible, without danger);
- The Environment & Community Manager will investigate the incident to determine the likely cause, record the outcome of the investigation (keep these records for the life of the facility) and take appropriate remedial actions;
- The Environment & Community Manager shall review the risk assessment and take appropriate actions to mitigate risk;
- If required, remove contaminated material (spills up to five litres or less) in a sensitive area, or remedy through an approved process (e.g. such as pollution caps to be implemented at the Water Containment Ponds).

NOTE: All incidents are to be reported to RMS immediately, as RMS is considered to be Principal Operator for the site.

5.5.1 [Incident Classification](#)

The NewCo process for reporting of environmental incidents prescribes classification to three levels:

Level 3: Low severity occurrence defined as pollution or degradation with short-term (less than one month) and reversible detrimental effects on the environment and/or community. For example, minor oil spill completely remediated.

Level 2: Medium severity defined as pollution or degradation with persistent (greater than three months) but not reversible detrimental effects on the community.

Level 1: High severity event defined as pollution or degradation that has or may have irreversible detrimental effects on the environment and/or community, for example, illegal clearing of endangered plants.

The Incident Notification and Escalation Process on Our Way contains more detailed incident classifications and the Pollution Incident Response Management Plan (PIRMP) details who needs to be notified if material harm is caused or threatened.

☞ *Process:* [Manage incidents](#)

☞ *Refer:* [M5 East Pollution Incident Response Management Plan \(PIRMP\)](#)

☞ *Refer:* [M5 East Incident Response Management Plan](#)

5.5.2 Incident Reporting & Investigation

Incident reporting will occur as follows:

Table 9: Incident reporting process at M5 East

TYPE / Classification	Notification	Process
SPILLS		
Hydrocarbons - MINOR RMS Category 2 RMS Reportable Event NEWCO Level 3	Internal - NEWCO (Cintellate) RMS Representative (immediate)	Spill Handling Procedure (M5E-ENV-06) Incident Response Plan for Spilled Loads - Toxic and Nontoxic (PR-IMP-10)
Hydrocarbons - MAJOR RMS Category 1 NEWCO Level 1 or 2	Internal - NEWCO (Branch) RMS Representative (immediate) EPA NSW (+ others)	Pollution Incident Response Management Plan (PIRMP) Incident Response Plan for Spilled Loads - Toxic and Nontoxic (M5E-IMP-2,3,4)
Chemical NON-HAZARDOUS RMS Category 2 RMS Reportable Event NEWCO Level 3	Internal - NEWCO (Cintellate) RMS Representative (immediate)	Spill Handling Procedure (M5E-ENV-06) Pollution Incident Response Management Plan (PIRMP)
Chemical HAZARDOUS RMS Category 1 NEWCO Level 1 or 2	Internal - NEWCO (Branch) RMS Representative (immediate) EPA NSW (+ others)	Pollution Incident Response Management Plan (PIRMP) Incident Response Plan for Spilled Loads - Toxic and Nontoxic (M5E-IMP-2,3,4)
DISCHARGE - WATER		
Wastewater from WTP MINOR exceedance RMS Category 2 RMS Reportable Event NEWCO Level 3	Internal - NEWCO (Cintellate) RMS Representative (immediate)	Refer Section 5.5.2 of this Plan
Wastewater from WTP MAJOR exceedance RMS Category 1 NEWCO Level 1 or 2	Internal - NEWCO (Branch) RMS Representative (immediate) EPA NSW (+ others)	Pollution Incident Response Management Plan (PIRMP)
DISCHARGE - AIR		
Air Quality MINOR exceedance RMS Category 2 RMS Reportable Event NEWCO Level 3	Internal - NEWCO (Cintellate) RMS Representative (immediate)	Refer Section 8.1.7 of this Plan In Tunnel Air Quality Incident Reporting (M5E-ENV-18) Ambient Air Quality Incident Reporting (M5E-ENV-19)
Air Quality MAJOR exceedance RMS Category 1 NEWCO Level 1 or 2	Internal - NEWCO (Branch) RMS Representative (immediate) EPA NSW (+ others)	Pollution Incident Response Management Plan (PIRMP)
FIRE		
Fire contained on site RMS Category 2 RMS Reportable Event NEWCO Level 3	Internal - NEWCO (Cintellate) RMS Representative (immediate)	M5 East Incident Response Plan

TYPE / Classification	Notification	Process
	Fire & Rescue NSW	
Fire travelling beyond site boundary RMS Category 1 NEWCO Level 1 or 2	Internal - NEWCO (Branch) RMS Representative (immediate) Fire & Rescue NSW EPA NSW (+ others)	M5 East Incident Response Plan Pollution Incident Response Management Plan (PIRMP)
UNEXPECTED FINDS		
Contaminated soils, asbestos or other potentially hazardous substances encountered RMS Category 2 RMS Reportable Event NEWCO Level 3	Internal - NEWCO (Cintellate) RMS Representative (immediate)	Manage asbestos Contaminated land Unexpected Discovery of Asbestos Procedure (M5E-ENV-23)
Archaeological find RMS Category 2 RMS Reportable Event NEWCO Level 3	Internal - NEWCO (Cintellate) RMS Representative (immediate)	Cultural heritage

Direct contact with the EPA and relevant authorities will occur in the event an incident has caused material harm. Further information of the reporting requirements for environmental incidents is detailed in the Pollution Incident Response Management Plan (PIRMP).

All incidents require an Incident Report to be completed in Cintellate. Each incident will be reviewed to determine the correct method of investigation to be applied (as required). Incidents and their associated actions shall be closed out to the satisfaction of the Environment & Community Manager or other as required.

If incident is deemed a nonconformance and requires corrective/preventative action, a Nonconformance Report and associated corrective/preventative actions shall be registered and tracked in Cintellate.

- ☞ Process: [Report environmental incidents](#)
- ☞ Process: [Investigate and analyse incidents](#)
- ☞ Process: [Raise nonconformance report](#)
- ☞ Process: *Incident Classification & Reporting Procedure (RMS) - refer Table 2*

5.5.3 Environmental Emergencies

In the event of an environmental emergency:

- Personnel will take immediate action to reduce any risk associated with the incident;
- Notify Supervisor and the Environment & Community Manager;
- Environment & Community Manager will coordinate remediation works through RMS and the Environment Protection Authority (EPA) if material harm will or could potentially occur; and
- The appropriate authorities will be notified in accordance with the Pollution Incident Response Management Plan (PIRMP).

NOTE: As M5 East does not require an Environment Protection Licence (EPL), a Pollution Incident Response Management Plan (PIRMP) is not required. However, the M5 East Project has prepared a PIRMP given the possibility of associated with spills from goods transport vehicles.

- ☞ Refer: *Pollution Incident Response Management Plan (PIRMP)*

5.5.4 Hazardous Substances & Spill Response

Where hazardous substances are stored or in use, M5 East will maintain emergency response capability and a suitable number of spill kits, or suitably stocked area in a proximate location, to contain approximately 200 litres of fuel or chemical spill.

All hazardous substances shall be subjected to a risk assessment, undertaken and recorded in ARM. Subcontractors shall also be informed of this requirement during site induction.

☞ *Process: Spill Handling Procedure (M5E-ENV-06)*

☞ *Process: [Manage workplace risk - hazardous materials](#)*

☞ *Process: [Hazardous substances and dangerous goods](#)*

☞ *Process: Incident Classification & Reporting Procedure (RMS) - refer Table 2*

Spill Response

M5 East shall implement best-practice environmental controls for the prevention and management of spills and release of hazardous materials. Spills would typically be caused by:

- Accidental spillage from damaged vehicles following motor vehicle incidents
- Loss of load from goods transport vehicles, e.g. fuel, chemicals and other hazardous materials
- Controlled discharge of waters outside limits of approval (i.e. from Water Treatment Plant)

M5 East has a designated Spill Response Trailer, which is available 24 hours a day to ensure all minor spills are addressed as soon as possible. Spill kits are also available at the MCC storeroom and other identified potential risk areas (e.g. Incident Response Vehicle).

Incidents involving hazardous materials / dangerous goods are incorporated into the M5 East Incident Response Plan to ensure processes are in place to deal with such incidents.

☞ *Process: M5 East Incident Response Plan*

5.5.5 Fire Safety & Burning-off

Under no circumstances are fires to be lit within the asset boundary by M5 East personnel. The following requirements must be adhered to in order to ensure the safety of persons and property:

- All items of plant used during proclaimed high fire danger periods that could discharge sparks must be fitted with spark arresters.
- No cutting, welding, grinding or other activities (likely to generate fires in the open) may be performed on days when a total fire ban is proclaimed.
- When there is a risk of fire being caused by work such as welding, thermal or oxygen cutting, heating or other fire producing or spark producing operations or when burning off is proposed, all personnel must be proficient in fire prevention, fire safety and basic fire fighting skills. Provide all personnel and vehicles involved in such activities with fire fighting equipment.

6. Measuring Performance

6.1 Monitoring & Measurement

Environmental monitoring programs will be implemented at the M5 East to ensure ongoing compliance with the MCoA Conditions, and to ensure that LS NewCo maintain a high level of environmental performance. Each monitoring program has been designed in accordance with the relevant regulatory requirements and with the aim of achieving the specific objectives and targets for the relevant environmental aspects. The environmental monitoring program is updated on a monthly basis to ensure all monitoring has been completed and is up to date.


The Environment & Community Manager is responsible for checking all monitoring data and for evaluating compliance with relevant goals and limits and assessing the performance of environmental management measures. The Environment & Community Manager will report to the O&M Manager on overall environmental performance on a regular basis (minimum monthly).

6.2 Routine Monitoring

This section provides details of monitoring programs that will be implemented during the operation and maintenance of M5 East. All procedures developed for routine environmental monitoring will be available via 'Our Way' (NEWCO intranet).

Table 10: Routine monitoring conducted at M5 East

Action	Frequency	Responsibility
Environmental Inspection	Weekly	Maintenance Manager Environment & Community Manager
Water Containment Pond Maintenance Monitoring (visual)	Weekly	Maintenance Manager
Water Containment Pond Monitoring (visual)	Monthly	Environment & Community Manager
Water Containment Pond Monitoring (full investigation)	6-monthly	Environment & Community Manager
Water Quality Monitoring of the Water Treatment Plant (WTP)	Fortnightly	Environment & Community Manager
Air Quality Monitoring	Continuous	Environment & Community Manager
Noise Monitoring (plant noise)	Continuous	Environment & Community Manager
Settlement & Groundwater Monitoring	Every 2 years	Maintenance Manager
Inspection of Cooks River Clay Plain Scrub Forest (boundary fences only)	Monthly	Maintenance Manager
Inspection of Frog Corridor	Quarterly	Environment & Community Manager

 Refer Section 8 of this plan for monitoring requirements of significant environmental aspects for M5 East

6.3 Quality Assurance

In order to satisfy MCoA Condition 14, each monitoring program includes quality assurance (QA) and quality control (QC) components. The primary aim of a QA/QC program is to ensure the integrity of the samples and analytical results.

QA/QC procedures for sampling are designed in accordance with relevant guidelines and standard practice, including Australian Standards and EPA Approved Methods. QA/QC procedures for analysis are maintained and implemented by individual laboratories utilised for sample analysis. All samples collected during operation of the M5 East are sent to NATA

accredited laboratories for analysis. This process ensures that analysis of all samples is conducted in accordance with NATA accredited methods and procedures for quality control.

6.4 Calibration of Equipment

All testing equipment shall be calibrated on a regular basis, according to manufacturer's specifications and/or relevant Australian Standards. Environmental measuring equipment requiring calibration at M5 East includes:

- Air quality monitoring instrumentation
- pH / conductivity meters
- turbidity meters

Intervals for calibrating the aforementioned equipment are scheduled in Maximo. Calibration records for air and water quality monitoring instrumentation is maintained in Maximo, whilst water quality monitoring equipment (i.e. pH / conductivity meters and turbidity meters) is also registered on the *M5 East Calibration Register - Environment* (spreadsheet) located on K: drive.

☞ *Record: M5 East Calibration Register – Environment*

☞ *Record: Maximo*

☞ *Refer: Test Instrument Calibration*

☞ *Refer: M5 East Quality Plan*

6.5 Document & Record Control

M5 East documents including records, reports are subject to control in accordance with the Records Management Plan and are available on request.

Documents are to be managed through the following systems depending on type:

- Management System documents are issued to distributed copy holders (as per distribution list for the relevant document) and electronic copies are available to all M5 East personnel through the LS NewCo Intranet (Our Way)
- Australian Standards, Legislative and Statutory documentation can be located LS NewCo intranet where the M5 East personnel will have login account and accessibility
- Technical documents, specifications, correspondence or communication (pending approval from authorised staff) are controlled through Incite (electronic Document Management System)

☞ *Refer: M5 East Quality Plan*

☞ *Refer: M5 East Records Management Plan*

7. Review

7.1 Reporting

Reporting on the outcomes of monitoring is undertaken on a regular basis. Monitoring reports include:

- Monitoring objectives;
- Details of the sampling program: sample locations, type, frequency of sampling, parameters that will be tested/measured;
- QA/QC program, including number and type of samples collected;
- Description of environmental conditions during sampling (e.g. weather);
- Analytical results, including summary of any exceedances, and the context of limits prescribed by the MCoA Conditions; and
- Recommendations for management measures including recommendations for future monitoring.

Reporting of exceedances is also performed in the event of an environmental parameter exceeding limits/goals.

All reports are submitted in electronic format, and stored on InCITE (electronic Document Management System).

7.1.1 Routine Reporting

Table 11: M5 East routine environmental reporting submitted to RMS

Report	Frequency	Due
Environmental Report <ul style="list-style-type: none"> • information required by the Environment Management Plan; and • information required by the Planning Minister's Conditions of Approval. 	Monthly	Within 5 days of EOM
Air Quality - Raw Data	Monthly	Within 5 days of EOM
Ambient Air Quality Data	Posted on RMS website, updated every 30 minutes: http://www.rms.nsw.gov.au/projects/sydney-south/m5-east/index.html	
Report 5 - In Stack Air Quality Monitoring	Monthly	Within 5 days of EOM
Report 6 - In Tunnel Air Quality Monitoring	Monthly	Within 5 days of EOM
Water Treatment Plant & Wolli Creek Test Results <ul style="list-style-type: none"> • present condition and results; • non compliances; • comparison with previous results; and • trend analysis of results. 	Monthly	Within 5 days of EOM
Water Containment Pond Monitoring <ul style="list-style-type: none"> • present condition and results; • comparison with previous results; and • trend analysis of results. 	6-monthly	Within 5 days of EOM following each 6-month period following the Contract commencement date
Plant Noise Monitoring Report	Monthly	Within 5 days of EOM

7.1.2 Exceedances

Table 12: M5 East exceedance reporting requirements

Report	When	Report	How
Air quality	Immediately > RMS	Within 3 days of exceedance event <ul style="list-style-type: none"> To be reported as per Contract, Appendix 24 (to SSR) Item 22 	Phone Electronic report
Water quality	Immediately > RMS	Within 3 days of exceedance event <ul style="list-style-type: none"> When the exceedance occurred What has caused the exceedance or whether further investigation is required What is being done to remediate the exceedance 	Phone Electronic report

- ☞ *Process: Water Treatment Plant Sampling (M5E-ENV-17)*
- ☞ *Process: In Tunnel Air Quality Incident Reporting (M5E-ENV-18)*
- ☞ *Process: Ambient Air Quality Incident Reporting (M5E-ENV-19)*

7.2 Management Review

The purpose of management reviews is to determine the effectiveness of the LS NewCo Environmental Management system and M5 East Management Plans. The process for conducting a management review is detailed on the NEWCO PMS 'Our Way' - Conduct Management Review.

Management reviews of performance are conducted:

- annually (as a minimum)
- as a result of an environmental incident or trend in environmental incidents
- upon identification of new risks
- due to legislative changes

The intent of a Management Review is to:

- follow-up actions from previous management reviews;
- review overall results of audits, and evaluations of compliance with legal requirements, and with other requirements to which the organisation subscribes;
- determine the extent to which objectives and targets have been met;
- review overall results of communication(s) from customers/clients and external interested parties, including complaints;
- review process performance and product conformity;
- determine status of incident investigations, and associated corrective and preventive actions;
- review overall results of stakeholder participation and consultation;
- review changes (including developments) in legal and other requirements that could affect the SHEQ management system; and
- review M5 East performance against overall SHEQ performance of the organisation.

Table 13: Management reviews conducted at M5 East

Review item	Frequency	Responsibility
Legal & other requirements	6-monthly, or when notified/aware of change	Environment & Community Manager
Environmental Management	Once a year	Branch Environmental Manager

- ☞ *Process: [Conduct project management review](#)*
- ☞ *Record: [PMS Management Review](#)*

8. Management of Significant Environmental Aspects

This section details each significant environmental aspect identified at M5 East, and the process in place to manage the potential impacts.

8.1 Air Quality

8.1.1 Objective

To manage impacts of M5 East's operation and maintenance with respect to maintaining tunnel and stack emissions within acceptable levels.

8.1.2 Legal & Other Requirements

Table 14: Legal and other requirements relating to air quality

Document	Requirement
MCoA Condition 70	The tunnel ventilation system(s) must be designed and operated so that the World Health Organisation (WHO) 15-minute carbon monoxide (CO) goal of 87ppm is not exceeded under any conditions.
MCoA Condition 71	In any event, the [tunnel portal] air emissions must not result in the following ambient air quality emerging goals being exceeded at ground level: <ul style="list-style-type: none"> • NO₂: 1hr average of 256mg/m³ (0.125ppm) • PM₁₀: 24hr average of 50mg/m³
MCoA Condition 72	The tunnel exhaust stack must be designed so that emissions do not result in ambient air quality at ground level exceeding the following emerging goals: <ul style="list-style-type: none"> • NO₂: 1hr average of 256mg/m³ (0.125ppm) • PM₁₀: 24hr average of 50mg/m³ • Benzene: 3min average of 0.10mg/m³ (0.033ppm) • 1-3 Butadiene: 3min average of 1.0mg/m³ (0.45ppm) • Acetaldehyde: 3min average of 0.076mg/m³ (0.042ppm) • Formaldehyde: 3 minute average of 0.10mg/m³ (0.033ppm)
Contract № 10.2137.1882 Appendix 3, Section 2.1	Details operational standards (i.e. criteria) for air quality management.
Contract № 10.2137.1882 Appendix 5, Table 1	Refer items 70 through 79.
Contract № 10.2137.1882 Appendix 24, Ref 21	Air quality reports to be provided monthly, within 5 business days of end of month. As a minimum, the Report is to include the Air Quality recordings: <ul style="list-style-type: none"> • CO (15 min average in tunnel); • NO₂ (tunnel portals and at ground level); and • PM₁₀ (tunnel portals and at ground level).
Contract № 10.2137.1882 Clause 19.1 Appendix 24, Ref 22	'Air Quality Exceedance Reports' that for each exceedance event, as a minimum, the report is to include all information as required by the document 'M5 East Motorway Tunnel DUAP Condition 73/4 Protocol'

8.1.3 Goals & Limits

Table 15: In-tunnel air quality exposure limits (experienced by motorists)

Parameter	Monitoring Period (rolling)	Limit
CO	15min	87ppm

Table 16: Tunnel portal air quality CO point limit (measured at each monitoring location)

Parameter	Monitoring Period (rolling)	Limit
CO	3min	200ppm

Table 17: In-tunnel visibility*

Parameter	Limit
Visibility - normal traffic	0.009m ⁻¹
Visibility - congested traffic	0.007m ⁻¹
Visibility - exceptional congestion	0.005m ⁻¹

*Source: World Health Organisation (WHO)

Table 18: In-stack air quality limits

Parameter	Monitoring Period	Limit
NO	1hr average	No limits set as measurements used as comparison with ambient results (i.e. CBMS monitoring).
NO ₂	1hr average	
NO _x (as NO ₂)	1hr average	
PM ₁₀	24hr average	
Flow-rate	1hr average	
Temperature	1hr average	

Table 19: Ambient air quality standards

Parameter	Monitoring Period	Limit
NO ₂	1hr average	256mg/m ³ (0.125ppm)
PM ₁₀	24hr average	50mg/m ³
Benzene	3min average	0.10mg/m ³ (0.033ppm)
1-3 Butadiene	3min average	1.0mg/m ³ (0.45ppm)
Acetaldehyde	3min average	0.076mg/m ³ (0.042ppm)
Formaldehyde	3min average	0.10mg/m ³ (0.033ppm)

8.1.4 Control Mechanisms

The following procedures and protocols will be implemented:

Table 20: Procedures relating to air quality management*

Document	Title
M5E-ENV-15	Air Quality Monitoring
M5E-ENV-07	In Tunnel Air Quality Management

Document	Title
M5E-ENV-12	In Tunnel CO Operating Requirements
M5E-ENV-18	Air Quality Incident Reporting - In Tunnel
M5E-ENV-19	Air Quality Incident Reporting - Ambient
-	Pollution Incident Response Management Plan (PIRMP)

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

The Central Monitoring and Control System (CMCS) receive data from various instruments during normal operating conditions. The CMCS converts the continuous supply of data into average figures that allow for automatic or manual adjustment of the tunnel ventilation system as appropriate to ensure that air quality remains below the specified CO limits.

☞ Process: [Air quality](#)

8.1.5 Monitoring & Measurement

Portal Emissions

All practicable measures shall be taken to minimise air quality impacts, and the period of portal emissions shall be limited to that necessary until normal traffic operations resume. In-tunnel levels of CO and NO_x will be measured at portal locations as indicators to demonstrate compliance with MCoA 71. Visibility will be monitored concurrently with CO.

Table 21: Portal air quality monitoring instrumentation

Location	Instruments	Parameters	EPA Method
ACA206 <i>Maximo Asset # 19WBC-ACA206</i> ANA206 <i>Maximo Asset # 19WBC-ANA206</i> CRX (western side) - WB breakdown bay	Gas Analysers	CO/NO _x	AM6/AM12
ACA008 <i>Maximo Asset # 19WBC-ACA206</i> ANA008 <i>Maximo Asset # 19WBC-ANA206</i> Duff Street - corner of the Intake Station	Gas Analysers	CO/NO _x	AM6/AM12
ACA103 <i>Maximo Asset # 18EBC-ACA103</i> ANA103 <i>Maximo Asset # 18EBC-ANA103</i> Main Tunnel - EB exit portal	Gas Analysers	CO/NO _x	AM6/AM12
ACA501 <i>Maximo Asset # 14EBR-ACA501</i> ANA501 <i>Maximo Asset # 14EBR-ANA501</i> Main Tunnel - Princes Hwy exit ramp, adjacent egress stairs	Gas Analysers	CO/NO _x	AM6/AM12
ACA204 <i>Maximo Asset # 07WBC-ACA204</i> ANA204 <i>Maximo Asset # 07WBC-ANA204</i> Main Tunnel - Bexley Rd end, near WQP05	Gas Analysers	CO/NO _x	AM6/AM12
ACA702 <i>Maximo Asset # 16EBR-ACA702</i> ANA702 <i>Maximo Asset # 16EBR-ANA702</i> Main Tunnel - Marsh St EB exit ramp, near fire tanks	Gas Analysers	CO/NO _x	AM6/AM12

The data from these instruments will be transmitted to the Central Monitoring and Control System (CMCS) for storage. During normal operating conditions, the tunnel ventilation system will be adjusted automatically to ensure discharge from the portals is avoided as far as practical (except in case of fire or incident). Emitting from portals is not permitted for the M5 East tunnel, and as such there should be no impact on the air quality at and around the portals.

In-Tunnel Air Quality

In-tunnel air quality monitoring parameters and associated instrumentation are listed below:

Table 22: In-tunnel air quality monitoring instrumentation

Location	Instruments	Parameters	EPA Method
ACO301 <i>Maximo Asset # 14EBT-ACO301</i> Main Tunnel EB - Princes Hwy exit	Gas Analysers	CO Temperature (°C)	AM6/AM12
AQS301 <i>Maximo Asset # 13EBT-AQS301</i> Main Tunnel EB - Duff Street Substation	Gas Analysers	CO/NO _x Visibility Temperature (°C)	AM6/AM12
ACO302 <i>Maximo Asset # 15EBT-ACO302</i> Main Tunnel EB - before Marsh St exit	Gas Analysers	CO Temperature (°C)	AM6/AM12
AQS302 <i>Maximo Asset # 15EBT-AQS302</i> Main Tunnel EB - at eastern crossover	Gas Analysers	CO/NO _x Visibility Temperature (°C)	AM6/AM12
AQS305 <i>Maximo Asset # 21EBT-AQS305</i> CRX - eastern exit portal	Gas Analysers	CO/NO _x Visibility Temperature (°C)	AM6/AM12
ACO403 <i>Maximo Asset # 15WBT-ACO403</i> Main Tunnel - westbound entry portal	Gas Analysers	CO Temperature (°C)	AM6/AM12
AQS403 <i>Maximo Asset # 13WBT-AQS403</i> Main Tunnel WB - near exhaust tunnel	Gas Analysers	CO/NO _x Visibility Temperature (°C)	AM6/AM12
AQS404 <i>Maximo Asset # 08WBT-AQS404</i> Main Tunnel WB - Bexley Rd portal	Gas Analysers	CO/NO _x Visibility Temperature (°C)	AM6/AM12
AQS406 <i>Maximo Asset # 21WBT-AQS406</i> CRX - westbound exit portal	Gas Analysers	CO/NO _x Visibility Temperature (°C)	AM6/AM12
ACO604 <i>Maximo Asset # 15WBR-ACO604</i> Main Tunnel WB - Marsh St ramp	Gas Analysers	CO Temperature (°C)	AM6/AM12

The data from these instruments will be transmitted to the Central Monitoring and Control System (CMCS) for storage. During normal operating conditions, the tunnel ventilation system will be adjusted automatically to ensure tunnel air quality and visibility is maintained as low as practical (except in case of fire or incident).

The temperature and volumetric flow-rate of ventilation air in the tunnel will also be continuously monitored. The temperature and flow-rate data shall be taken into account for the purposes of assessing compliance with MCoA Condition 72. The tunnel ventilation system will be operated in such a manner that will ensure that the emissions concentrations expressed as a function of volumetric flow rate of ventilation air will be met at all times.

In-Stack Air Quality

In-stack air quality monitoring parameters and associated instrumentation are listed in Table 23 below:

Table 23: In-stack air quality parameters and monitoring instrumentation

Pollutant	Unit	Instrumentation
NO	ppm	NO _x Analysers
NO ₂	ppm	NO _x Analysers
NO _x (as NO ₂)	ppm	NO _x Analysers
PM ₁₀	ug/m ³	GRIMM
Flow-rate	m ³ /s	Velocity monitor
Temperature	°C	Resistance Temperature Device (RTD)

The temperature and volumetric flow-rate of ventilation air in the stack will also be continuously monitored. The temperature and flow-rate data shall be taken into account for the purposes of assessing compliance with MCoA Condition 72.

NOTE: only in-tunnel CO analysers are used for primary control. Data from the stack monitoring equipment and ambient monitoring equipment will not be used as the primary control for the tunnel ventilation system, but rather as a management tool.

Ambient Air Quality Standards & Monitoring

Ambient air quality monitoring will be undertaken and the tunnel ventilation system operated so that the tunnel and exhaust stack emissions do not result in ambient air quality at ground level exceeding that goals for NO₂ and PM₁₀ listed in table below.

A comprehensive monitoring network has been installed for ambient air quality measurements in the Turrella, Undercliffe and Bardwell Valley areas. Two additional stations (M1 and F1) are located adjacent to each of the main tunnel exit portals. Details of ambient air monitoring instrumentation are listed in Table 23 below:

Table 24: Ambient air quality monitoring instrumentation

Station #	Location	Instrument	Parameter	EPA Method
Station 1 (formerly T3) <i>Maximo Asset # 14EXT-AQM007</i>	Turrella Reserve, near Finlays Ave	TEOM	PM ₁₀	AS3580.9.8-2008
		Gas Analysis Instruments	NO, NO ₂ , NO _x and CO	AM-12 & AM-6
		Meteorological Instruments	Wind speed, wind direction, Sigma Theta, Temperature at 2m & 10m, Relative Humidity, Total Solar Radiation	AM-2 & AM-4
		AVOCS	Benzene 1,3-Butadiene Acetaldehyde Formaldehyde	TO-15 TO-15 TO-11A TO-11A
Station 2 (formerly X1) <i>Maximo Asset # 13EXT-AQM004</i>	Wavell Parade / David Street, Earlwood	TEOM	PM ₁₀	AS3580.9.8-2008
		Gas Analysis Instruments	NO, NO ₂ , NO _x and CO	AM-12 & AM-6
		Meteorological Instruments	Wind speed, wind direction, Sigma Theta, Temperature at 2m & 10m, Relative Humidity, Total Solar Radiation	AM-2 & AM-4

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Station #	Location	Instrument	Parameter	EPA Method
Station 3 (formerly U1) <i>Maximo Asset #</i> <i>14EXT-AQM005</i>	Jackson Pl, Undercliffe	High Volume Sampler and GRIMM	PM ₁₀	AM-18
		TEOM	PM ₁₀	AS3580.9.8- 2008
		Gas analysis instruments	NO, NO ₂ , NO _x and CO	AM-12 & AM-6
		Meteorological instruments	Wind speed, wind direction, Sigma Theta, Temperature at 2m & 10m, Relative Humidity, Total Solar Radiation	AM-2 & AM-4
Station 4 (formerly T1) <i>Maximo Asset #</i> <i>14EXT-AQM006</i>	Thompson St, Turrella	High Volume Sampler	PM ₁₀	AM-18
Station 5 (formerly CBMS) <i>Maximo Asset #</i> <i>13EXT-AQM003</i>	Gipps St Lookout, also referred to as Arncliffe Park Lookout	TEOM	PM ₁₀	AS3580.9.8- 2008
		Gas Analysis Instruments	NO, NO ₂ , NO _x and CO	AM-12 & AM-6
		Meteorological Instruments	Wind speed, wind direction, Sigma Theta, Temperature at 2m & 10m, Relative Humidity, Total Solar Radiation	AM-2 & AM-4
F1 <i>Maximo Asset #</i> <i>08EXT-AQM002</i>	Flatrock Rd, Kingsgrove	TEOM	PM ₁₀	AS3580.9.8- 2008
		Gas Analysis Instruments	NO, NO ₂ , NO _x and CO	AM-12 & AM-6
		Meteorological Instruments	Wind speed, wind direction, Sigma Theta, Temperature at 2m & 10m, Relative Humidity, Total Solar Radiation	AM-2 & AM-4
M1 <i>Maximo Asset #</i> <i>17MCC-AQM001</i>	Motorway Control Centre (MCC), West Botany St	TEOM	PM ₁₀	AS3580.9.8- 2008
		Gas Analysis Instruments	NO, NO ₂ , NO _x and CO	AM-12 & AM-6
		Meteorological Instruments	Wind speed, wind direction, Sigma Theta, Temperature at 2m & 10m, Relative Humidity, Total Solar Radiation	AM-2 & AM-4
<p>CBMS = Community Based Monitoring Station.</p> <p><u>EPA Methods:</u></p> <ul style="list-style-type: none"> • AM = NSW EPA, 2001, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW • TO14 = USEPA, 1999, Method TO-14, Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Specially Prepared Canisters With Subsequent Analysis by Gas Chromatography. EPA/625/R-96/010b • TO15 = USEPA, 1999, Method TO-14, Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Specially Prepared Canisters With Subsequent Analysis by Gas Chromatography, Mass Spectrometry (GC/MS) EPA/625/R-96/010b 				

8.1.6 Maintenance

Ambient Air Quality Instruments

NEWCO has engaged a service provider who delivers NATA-endorsed field services, maintenance, and reporting as per RMS requirements for all ambient air quality monitoring instrumentation. The service provider will ensure compliance with relevant Australian standards and *ISO 17025 - General requirements for the competence of testing and calibration laboratories*. The service provider will prepare and attend 6-monthly external audits and also address any concerns and/or nonconformance raised by the auditors.

Ambient air quality monitoring instruments are subjected to 6-monthly audits by an external auditor as per MCoA Condition 75. The audit aims to:

- Ensure the operating and maintenance procedures and equipment for monitoring air quality and emissions monitoring data comply with NATA (or equivalent) requirements and sound laboratory practice; and
- Ensure that reporting of monitoring results comply with NATA (or equivalent) requirements.

Maintenance of air monitoring equipment is carried out in accordance with the supplier/manufacturer's requirements.

In-tunnel & Portal Air Quality Instrumentation

Air quality instrumentation installed for monitoring in-tunnel and portal emissions is maintained by NEWCO technicians, which is scheduled in Maximo.

8.1.7 Reporting

Air quality reporting is undertaken in accordance with MCoA Condition 75, and all reports are to be made publicly available. Air quality reports required under the Contract are as follows:

- In-Stack Air Quality Monitoring Report (Report 5)
- In-Tunnel Air Quality Monitoring Report (Report 6)
- Air Quality Raw Data (in-stack, in-tunnel, portal)
- Ambient Air Quality Monitoring - updated every 30 minutes on RMS website

Notifications during and after air quality incidents and of CO exceedances are to be reported to RMS immediately in line with the In Tunnel Air Quality Incident Reporting Procedure PR-ENV-18, the NSW Government's DUAP Condition 73/4 Protocol, and the Pollution Incident Response Management Plan (PIRMP).

8.1.8 Quality Assurance & Control

A quality control program will be undertaken to ensure analytical results and their interpretation are valid. This includes monitoring activities and procedures from the collection of samples to the presentation of results.

In accordance with MCoA Condition 75, validation of the ambient air quality assessment by an independent organisation, approved by RMS will be undertaken. Compliance Reports will be prepared and provided to RMS on a monthly basis.

 Refer: M5 East Quality Plan

8.1.9 References

- M5 East Motorway Tunnel DUAP Condition 73/4 Protocol (Minister's Conditions of Approval)

8.2 **Noise, Vibration & Dust**

8.2.1 Objective

To ensure public amenity is not affected by noise, vibration and dust generation.

8.2.2 Legal & Other Requirements

Table 25: Legal and other requirements relating to noise, vibration and dust

Document	Requirement
MCoA Condition 53	A detailed Noise and Vibration Management Procedure must be prepared as part of the EMPs referred to in Conditions 10 and 13 to the satisfaction of the EPA. The Procedure must provide details of noise and vibration control measures to be undertaken during both the construction and operation stages sufficient to address the technical requirements for any EPA approvals/licenses.
MCoA Condition 54	The Procedure must include, but not be limited to, tests for ascertaining acoustic parameters; anticipated airborne noise and vibration for all major noise and vibration generating activities and locations and durations of these activities; impacts from site compounds/construction depots; location, type and timing of erection of temporary and permanent noise barriers; other specific physical and managerial measures for controlling noise and vibration; noise and vibration control equipment to be fitted to machinery; predicted noise and vibration levels at sensitive receivers; noise and vibration monitoring and reporting procedures; measures for dealing with exceedances; arrangements to inform residents of construction activities likely to affect their noise amenity; contact point for residents; complaints handling systems; reporting of complaints and response actions. The Procedure must be prepared prior to the construction and operation (as appropriate) of the proposal and must be made publicly available.
Contract № 10.2137.1882 Appendix 3, Section 2.1	Details operational standards (i.e. criteria) for noise and vibration management.
Contract № 10.2137.1882 Appendix 30, Clause 3(b)(vii)B	The Environmental Management Plans must, as a minimum: ...address the need for environmental safeguards and the adoption of environmentally sensitive work practices during any of the Services, including, but not limited to, processes and procedures for: <ul style="list-style-type: none"> • management measures to reduce noise levels • dust control measures, including monitoring, mitigation and remedial actions

8.2.3 Goals & Limits

Table 26: Noise criteria (limits)

Location	Time Period	Limit
Duff St Air Intake	0500-2200	66
	2200-0500	57
Turrella Exhaust Shaft	-	92

Table 27: M5 East noise targets

Aspect	Goal
Noise	No complaints relating to noise generation
Vibration	No complaints relating to vibration
Dust	No complaints relating to dust generation

8.2.4 Control Mechanisms

In order to minimise the disturbance caused by activities, works will be scheduled between 0700 and 1800 hours (where practicable). However, due to contractual requirements regarding lane closures, it may be necessary to carry out a large proportion of maintenance operations out-of-hours.

In order to minimise noise impacts from out-of-hours maintenance activities, the following controls will be implemented as a minimum:

- Community and RMS will be given adequate notice of any noise-generating activities undertaken out-of-hours
- Maintain plant and equipment in good working order to ensure it does not breach general EPA noise guidelines
- Avoid use of residential streets wherever possible

Engineering design controls were implemented during construction to mitigate noise and vibration caused by tunnel ventilation, including:

- Fans (both supply and exhaust) have been fitted with mounting silencers and vibration isolation points
- Noise walls have been installed to prevent unacceptable levels of noise from reaching nearby sensitive receivers

Table 28: M5 East procedures relating to noise*

Document	Title
M5E-ENV-01	Noise
M5E-ENV-14	Operational Traffic Noise Monitoring

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

☞ *Process:* [Noise and vibration](#)

☞ *Process:* [Air Quality](#)

8.2.5 Monitoring & Measurement

Operational noise from traffic is the responsibility of RMS. Monitoring may be conducted on behalf of RMS if requested.

8.2.6 Reporting

M5 East will produce a Plant Noise Monitoring Report on a monthly basis, detailing the performance of the nominated components of fixed plant against the requirements of the NSW EPA Road Noise Policy.

8.2.7 Quality Assurance & Control

A quality control program will be undertaken to ensure analytical results and their interpretation are valid. This includes monitoring activities and procedures from the collection of samples to the presentation of results.

In accordance with Contract № 10.2137.1882 Appendix 3, Section 2.1, validation of the ambient air quality assessment by an independent organisation, approved by RMS will be undertaken. Compliance Reports will be prepared and provided to RMS on a monthly basis (i.e. Monthly Plant Noise Report).

☞ *Refer:* [M5 East Quality Plan](#)

8.2.8 References

M5 East Environmental Impact Statement (1994)

8.3 Hydrology & Flooding

8.3.1 Objective

To minimise the likelihood and consequence of flooding on the M5 East Motorway, including tunnels.

8.3.2 Legal & Other Requirements

Table 29: Legal and other requirements relating to hydrology and flooding at M5 East

Document	Requirement
Contract № 10.2137.1882 Appendix 3, Section 2.1	Details operational standards (i.e. criteria) for hydrology and flooding.

8.3.3 Goals & Limits

Engineering controls have been implemented to effectively manage the 1:100 year Average Recurrence Interval (ARI) rainfall event for the motorway, set at a level as to be above the Peak Maximum Flood Level. This is equivalent to 1:2000 ARI storm event.

8.3.4 Control Mechanisms

Conditions 106 -121 of the MCoA are considered to have been met during the construction phase, and during the first period of operation. This includes flood studies, drainage design reports, and stormwater management procedures.

Tunnel drainage systems are designed to be in accordance with MCoA 112, and all retaining walls at the tunnel portals were designed to be above the Peak Maximum Flood Level.

No modifications to existing systems are planned that would cause a breach in any of these conditions. Tunnel maintenance will ensure flood protection systems are capable of coping with such rainfall events.

NOTE: a 'flood event' relates to a section of the carriageway being closed to traffic due to flooding.

8.3.5 Incident Management

Incident management plans have been developed to manage flooding incidents. Additional flood mitigation controls are outlined below:

Table 30: Flood mitigation controls for M5 East

Area	Collection Point	Discharge Point	Controls
Main tunnel	Pump Pit 2	Wolli Creek	Water treatment plant located at Turrella: <ul style="list-style-type: none"> Contaminated water can be stored and pumped out by vacuum truck High volume discharge direct to Bardwell Creek in case of flooding, or Pump Pit 2 water levels become too high
Cooks River tunnel and above ground	Water Containment Ponds	N/A	Flow weirs are installed in each WQP to ensure water is diverted through the ponds and overflow pipes are fitted to accommodate 1:100 year flood events.

8.3.6 Monitoring & Measurement

Any significant flooding events will be investigated by the site Environment & Community Manager to determine their cause, and if the operation of M5 East Motorway has contributed in any way.

8.3.7 Control Mechanisms

Table 31: M5 East procedures relating to hydrology and flooding*

Document	Title
M5E-ENV-03	Water Quality Pond Maintenance
M5E-ENV-04	Discharging water into Bardwell Creek from Pump Pit 2
M5E-ENV-05	Containment and Disposal of Tunnel Wash Water
M5E-ENV-06	Containment and Disposal of Fire Fighting Waters

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

8.4 Water Quality

8.4.1 Objective

Prevent pollution of surface water.

8.4.2 Legal & Other Requirements

Table 32: Legal and other requirements relating to water quality at M5 East

Document	Requirement
MCoA Condition 114	As part of the EMP referred to in Conditions 10 and 13, a detailed Soil and Water Quality Management Procedure shall be prepared to the satisfaction of EPA and in consultation with DLWC, Sydney Water and the relevant Councils. The Procedure shall provide details of pollution control measures to be undertaken during both the construction and operation stages sufficient to address the technical requirements for obtaining relevant EPA approvals/licenses.
MCoA Condition 122	All stormwater and wastewater systems of the proposal shall be designed, constructed, operated and maintained to meet the requirements of the relevant authorities including EPA, SWC and relevant Councils.
MCoA Condition 125	Seepage, spillages, contaminated water, tunnel washing, fire fighting or other water in the tunnel which is likely to contain pollutant levels above the background concentrations of natural discharge points shall be directed into separate sumps with pump out facilities. This water shall not be discharged to the stormwater system unless otherwise agreed by the EPA.
Contract No 10.2137.1882 Appendix 3, Section 2.1	Details operational standards (i.e. criteria) for water quality monitoring.
RMS Specification G38	Specifies soil and water management requirements.

8.4.3 Goals & Limits

Water discharged from the water treatment plant must meet the following criteria:

Table 33: Water quality (treated effluent) criteria for M5 East discharge

Parameter	Criteria
Iron (Fe)	<5mg/L
Suspended Solids (TSS)	<50mg/L
pH	6.5 - 9.0

Table 34: Other water quality goals for M5 East

Item	Criteria
Water Containment Ponds	Outlet quality better than inlet quality

8.4.4 Control Mechanisms

The following procedural controls will be applied to manage water quality:

Table 35: M5 East procedures relating to water quality*

Document	Title
M5E-ENV-02	Water Quality Monitoring at Water Quality Ponds
M5E-ENV-03	Water Quality Pond Maintenance
M5E-ENV-04	Containment and disposal of tunnel wash waters
M5E-ENV-05	Containment and disposal of fire fighting water
M5E-ENV-06	Containment and handling of spills
M5E-ENV-17	Water treatment plant sampling
M5E-ENV-21	Discharging water into Bardwell Creek from Pump Pit 2

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

8.4.5 Monitoring & Measurement

Water monitoring is conducted according to the locations and frequency detailed in Table 36.

Table 36: Water quality monitoring at M5 East

Location	Sampling Details	Frequency
Water Treatment Plant <i>Referred to as 'Small Sample'</i>	<ul style="list-style-type: none"> • DAF Inlet • DAF Outlet 	Fortnightly
Wolli Creek <i>Referred to as 'Large Sample'</i>	<ul style="list-style-type: none"> • Upstream • Downstream • Creek Outlet 	Monthly
Water Containment (Quality) Ponds	WQP01, WQP02, WQP03, WQP04, WQP05, WQP06, WQP07, WQP08, WQP09, WQP11	6-monthly

Field Measurements

Field measurements will be recorded concurrently for all sampling events for the WTP, Wolli Creek and Water Containment (Quality) Ponds. Field parameters measures include:

- pH
- Temperature (°C)
- Iron (mg/L)
- Turbidity (NTU, or Nephelometric Turbidity Unit)

All field data shall be recorded in the *M5 East Water Quality Records* spreadsheet, located on K: drive.

Turbidity measurements taken with a handheld NTU meter will be compared with Total Suspended Solids (TSS) results obtained from the laboratory for each sampling event. The

comparison shall be documented in the *M5 East Water Quality Records* spreadsheet, and correlated to find a line of best fit. The resulting correlation co-efficient will be used to interpret all turbidity field results obtained as NTU. The correlation co-efficient shall be updated once a quarter to ensure accuracy.

☞ *Record: M5 East Water Quality Records (spreadsheet)*

Sampling

All water samples will be taken in accordance with NSW EPA's *Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales (2004)*. Each sampling point shall be referred to as a 'sampling event'. Processes, locations and reporting requirements are contained in the procedures outlined in Section 8.4.4 of this Plan.

☞ *Refer: NSW EPA Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales (2004)*

8.4.6 Quality Assurance & Control

A quality control program will be undertaken to ensure analytical results and their interpretation are valid. This includes monitoring activities and procedures from the collection of samples to the presentation of results.

NEWCO validates the water quality results by having the testing performed by an independent laboratory, approved by RMS. Any exceedances will be reported as prescribed in Section 5.5.2 of this Plan.

☞ *Refer: M5 East Quality Plan*

8.4.7 Reporting

A compliance report will be prepared and provided to RMS on a monthly basis. This report shall include the bi-monthly water sampling results from the water treatment plant.

Results from Water Containment Pond monitoring will be provided on a 6-monthly basis to RMS, 5 days after the Contract anniversary date and 6 months following that date.

Exceedances of water quality monitoring will be managed according to the procedure 'Water Monitoring' (M5E-ENV-02). All exceedances will be reported to RMS.

8.5 Groundwater & Settlement

8.5.1 Objective

To prevent and adequately monitor groundwater contamination and ground settlement within the asset area.

8.5.2 Legal & Other Requirements

Table 37: Legal and other requirements relating to groundwater and subsidence at M5 East

Document	Requirement
MCoA Condition 47	As part of the EMPs referred to in conditions 10 and 13, a detailed Groundwater Management Procedure shall be prepared to meet the requirements of DLWC and the EPA. The Procedure shall cover the complete proposal and shall provide details of groundwater control measures to be undertaken during both the construction and operation stages and include but not be limited to: impacts on nearby structures from potential settlement; groundwater inflow control; handling, treatment and disposal of contaminated groundwater; monitoring; auditing; measures for dealing with exceedances; and response actions. Approval from DLWC shall be obtained prior to the commencement of any dewatering work.
MCoA Condition 49t	TABLE 1 - SETTLEMENT CRITERIA FOR SPECIFIC STRUCTURES (AS2870-1996: Residential Slabs and Footings Construction)

Document	Requirement
	Structure/Facility Maximum Settlement - Maximum Angular Distortion - Buildings
MCoA Condition 52	Settlement shall be monitored throughout the construction period and for a period of not less than 12 months after construction to the satisfaction of the Director-General and paid for by the Proponent. The monitoring system shall be able to provide adequate forewarning of any significant subsidence of the ground surface. The monitoring shall also continue at appropriate intervals and frequency during the operation stage.
Contract № 10.2137.1882 Appendix 24, Item 7	Subsidence and Groundwater Monitoring Report (requirements).

8.5.3 Goals & Targets

It is assumed that all requirements specified in the MCoA for construction, and first 10 years of operation of the asset, have already been met and are therefore not discussed within this management plan.

Condition 49 specifies the maximum settlement and angular distortion allowed for certain structures. These criteria are presented below:

Table 38: Portal air quality parameters and monitoring instrumentation

Structure/Facility	Maximum Settlement	Maximum Angular Distortion
Buildings - clad frame	40mm	1/300
Articulated masonry veneer	30mm	1/400
Masonry veneer	20mm	1/600
Articulated full masonry	15mm	1/800
Full masonry	10mm	1/2000
Heritage	10mm	1/2000
> 3 levels	10mm	1/2000
Roads and parking areas	40mm	1/250
Parks	50mm	1/250
Critical utilities SWSOOS	4mm	-

8.5.4 Control Mechanisms

Groundwater entering the tunnel will be diverted to the stormwater drainage system. Subsidence will be monitored by use of the existing subsidence survey marks.

Any liquid fuels or chemicals stored on site will be stored in a suitable bunded area. The bunded area should be of the following guidelines:

- Have a holding capacity of at least 110% the largest container stored there or
- 20% of the total volume stored in that area, whichever is greater
- Bunds are to be kept clean and empty and should be pumped out after any spillages or significant rainfall events that may cause a reduction in the storage capacity of the area

The following procedure will be implemented to give effect to this Plan:

Table 39: M5 East procedures relating to groundwater and settlement*

Document	Title
M5E-ENV-10	Settlement monitoring

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

8.5.5 Monitoring & Measurement

The groundwater monitoring program was ceased in 2002 after it was found that the groundwater had stabilised. If for any reason it is believed that this situation has changed, in the future a groundwater monitoring program will be put back in place, authorities shall be notified and specialises will be consulted.

Previous settlement surveys have been completed by the previous site operator. These have indicated that no movement has been observed in any structures listed in the Ministers Conditions of Approval. Settlement surveys will be conducted on a two yearly basis or as directed by RMS to ensure this remains the case and should the situation change expert advice will be sought and further inspections and investigations carried out.

8.6 **Erosion & Sedimentation**

8.6.1 Objective

To minimise the impact of sediment-contaminated stormwater on receiving waters, and reduce batter scour within the asset area.

8.6.2 Legal & Other Requirements

Table 40: Legal and other requirements relating to erosion and sedimentation at M5 East

Document	Requirement
MCoA Condition 114	As part of the EMP referred to in Conditions 10 and 13, a detailed Soil and Water Quality Management Procedure shall be prepared to the satisfaction of EPA and in consultation with DLWC, Sydney Water and the relevant Councils. The Procedure shall provide details of pollution control measures to be undertaken during both the construction and operation stages sufficient to address the technical requirements for obtaining relevant EPA approvals/licenses.
RMS Specification G38	Specifies soil and water management requirements.

8.6.3 Goals & Limits

Sediment control measures were designed in conjunction with the NSW 'Blue Book' Managing Urban Stormwater. After 10 years of operation, it is reasonable to assume that the landscaping has effectively 'taken hold' and that NEWCO will be expected to maintain landscaping in such a way as to prevent or minimise erosion and subsequent sedimentation.

8.6.4 Control Mechanisms

Water quality ponds will be maintained in accordance with the Water Quality Pond maintenance procedure (M5E-ENV-03). Landscaping is also essential to prevent erosion of the non-paved areas of the Motorway. In order to ensure the landscaping is being effective at this purpose the following will be carried out as a minimum:

- Non paved areas have sufficient effective vegetative cover to prevent any adverse erosion
- Vegetated areas have effectively taken hold and do not need plants to be re-established.
- Water Quality Ponds are in good working order and well maintained and do not have sediment beyond 25% of their working capacity
- Removal of rubbish and silt from Gross Pollutant Trap

Table 41: M5 East procedures relating to erosion and sedimentation*

Document	Title
M5E-ENV-03	Water Quality Pond maintenance

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

8.6.5 Monitoring & Measurement

The monitoring of sediment control devices such as landscaping and Water Quality Ponds will be carried out in line with the Water Quality Pond maintenance procedure.

8.7 **Landscaping & Rehabilitation**

8.7.1 Objective

To ensure the M5 East landscaping and rehabilitation program achieves plant survival rates, and prevent adverse effects to visual amenity in the local area.

8.7.2 Legal & Other Requirements

Table 42: Legal and other requirements relating to landscaping and rehabilitation at M5 East

Document	Requirement
Contract № 10.2137.1882 Appendix 3, Clause 3.8.2	<ul style="list-style-type: none"> • Provide safe travel by maintaining clear zones and sight distances • Maintain aesthetically pleasing roadside • Maintain the plantings to minimize infestation of weeds • Prevent fire hazard
RMS Specification R178	Specifies vegetation management requirements.
RMS Specification R179	<p>Where weed infestation occurs, take the following action before clearing planting areas:</p> <ul style="list-style-type: none"> • for those species listed by the relevant local government authority as noxious categories W1, W2, W3, or W4 under the Noxious Weeds Act 1993, take action as required by the Act and the local government authority; and • for all other species, spray with herbicide. <p>Pruning will be carried out in accordance with AS 4373.</p> <p>A biodegradable red dye is to be included in the herbicide spray. The dye content used must be sufficient to ensure that the treated areas can be identified.</p> <p>Herbicide will not be sprayed in windy weather (wind of 10 km/hr or greater) or within such distance of a watercourse which would permit the herbicide to enter the water.</p>

8.7.3 Goals & Limits

Table 43: Landscaping and rehabilitation targets for M5 East

Item	Criteria
Vegetation plantings	No more than 25% failure by inspection

8.7.4 Control Mechanisms

Fertilisers & Weeds

Any noxious weeds must be removed. Noxious weeds in NSW include those documented in the 'Weed Control Orders' published in the NSW Government Gazette, or available online via

the Department of Primary Industries (DPI) [website](#): *Noxious Weed Declarations for Rockdale City Council*.

Herbicide will not be sprayed in windy weather (wind of 10 km/hr or greater) or within such distance of a watercourse which would permit the herbicide to enter the water. The same applies for pesticides and fertilisers. The use of these chemicals will be controlled to ensure it is not over-applied through training of personnel.

Green Waste & Mulch

All green waste from landscaping activities will be reused as mulch where possible. If not possible, it will be taken to a suitable green waste disposal location and treated appropriately. Stockpiles of vegetation earmarked for mulching shall be removed soon after placement to eliminate fire hazard.

Pruning

Pruning will be carried out in accordance with AS 4373.

Table 44: M5 East procedures relating to landscaping and rehabilitation*

Document	Title
M5E-ENV-16	Weed spraying

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

8.7.5 Monitoring & Measurement

As vegetation coverage forms part of the requirements for preventing erosion and sedimentation, asset inspections will include checks to ensure that the vegetation is acting to prevent erosion from non-paved areas. A bi-weekly drive through is conducted by landscaping staff to record any instances of excessive vegetation and/or weed growth. These inspections are scheduled and tracked in Maximo.

8.8 **Flora & Fauna**

8.8.1 Objective

To manage the impacts of M5 East operation and maintenance on local flora and fauna.

8.8.2 Legal & Other Requirements

Table 45: Legal and other requirements relating to flora and fauna at M5 East

Document	Requirement
MCoA Condition 82	All practical preventative measures must be taken in order to minimise any potential disturbance of habitats surrounding work sites.
MCoA Condition 84	The Proponent must comply with the conditions of concurrence as determined by NPWS.
MCoA Condition 85	The Proponent must prepare a plan of management for that part of the Salt Pan Creek wetlands affected by the proposal. The plan of management must address measures for the protection and revegetation of these wetlands both during and after construction of the Motorway.
RMS Specification R179	Stipulates landscaping requirements, including herbicide use and vegetation management.

8.8.3 Goals & Limits

Table 46: Landscaping and rehabilitation targets for M5 East

Item	Goal
Fauna	No fauna deaths caused by NEWCO activities
Flora and vegetation	No unauthorised clearing
Green & Golden Bell Frog	No plant or machinery damage or interference with the frog corridor

8.8.4 Control Mechanisms

Table 47: M5 East procedures relating to groundwater and settlement*

Document	Title
-	Land Disturbance Permit
M5E-ENV-08	Maintenance of Frog Corridor
M5E-ENV-09	Protection of Cooks River Plain Scrub
M5E-ENV-20	Finding/reporting wildlife at M5 East
-	Live animals on carriageway (Surface and Tunnel) (Motorway Operation Guidelines)
-	Attending stray animals Attending Stray Animals (Motorway Operation Guidelines)

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

🔗 Process: [Fauna and flora](#)

🔗 Process: [Vegetation clearing and land disturbance](#)

8.8.5 Monitoring & Measurement

Table 48: Flora and fauna monitoring at M5 East

Location	Sampling Details	Frequency
Frog corridor	<ul style="list-style-type: none"> DAF Inlet DAF Outlet 	Fortnightly
Water Containment Ponds	WQP01, WQP02, WQP03, WQP04, WQP05, WQP06, WQP07, WQP08, WQP09, WQP11	6-monthly

8.9 Contaminated Soil

8.9.1 Objective

To ensure the management of any contaminated soil identified during the operation and maintenance of the M5 East Motorway.

8.9.2 Legal & Other Requirements

Table 49: Legal and other requirements relating to contaminated soil at M5 East

Document	Requirement
MCoA Condition 114	As part of the EMP referred to in Conditions 10 and 13, a detailed Soil and Water Quality Management Procedure shall be prepared to the satisfaction of EPA and in consultation with DLWC, Sydney Water and the relevant

Document	Requirement
	Councils. The Procedure shall provide details of pollution control measures to be undertaken during both the construction and operation stages sufficient to address the technical requirements for obtaining relevant EPA approvals/licenses.

8.9.3 Goals & Limits

Table 50: Contaminated soil targets for M5 East

Item	Goal
Contaminated sediment removed from tunnels during scheduled maintenance	No nonconformances or incidents
Contaminated sediment removed from water containment ponds	No nonconformances or incidents

8.9.4 Control Mechanisms

It is unlikely that any excavation will take place during the operation of the M5 East site. However, where any soil is suspected of being contaminated, the Environment & Community Manager will conduct preliminary investigations, and if necessary contact RMS and a specialist contractor for further advice.

The following procedures will be implemented to give effect to the Plan:

Table 51: M5 East procedures relating to contaminated soil*

Document	Title
M5E-ENV-11	Handling and disposing of contaminated soil

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

8.10 Heritage & Archaeology

8.10.1 Objective

To ensure any heritage items identified during the operation and maintenance of M5 East are managed appropriately.

8.10.2 Legal & Other Requirements

Table 52: Legal and other requirements relating to heritage at M5 East

Document	Requirement
MCoA Condition127	As part of the EMPs referred to in conditions 10 and 13, the Proponent must prepare a Procedure, to the satisfaction of the Director-General, which identifies, and presents management options, for heritage items. In preparing this Procedure, the Proponent must consult with the relevant Councils and SWC. Particular attention must be given to: the stone cottage at No. 96/96A West Botany Street; the SWSOOS and heritage sewer; and the pine trees located at the site of the former Rockdale Sewage Farm, Marsh Street.
MCoA Condition128	As part of the EMPs referred to in conditions 10 and 13, the Proponent must prepare a Procedure, to the satisfaction of the Director-General, which identifies, and presents management options, for archaeological items. In preparing this Procedure, the Proponent must consult with the relevant Councils, NPWS, Heritage Council and the relevant Local Aboriginal Land Council(s).

8.10.3 Goals & Limits

Table 53: Heritage targets for M5 East

Item	Goal
Unexpected heritage find	All finds reported immediately to RMS
Existing heritage or archaeological sites	No disturbance caused by NEWCO activities

8.10.4 Control Mechanisms

Discovery of Heritage Items and Sites of Potential Archaeological Significance will cause works to stop immediately and the relevant authorities will be contacted. Assessment will then be made by the appropriate authorities/stakeholders as to the best course of action.

☞ Process: [Cultural heritage](#)

8.10.5 Monitoring & Measurement

Monitoring will be carried out as required, e.g. during excavation activities.

8.11 Waste & Recycling

8.11.1 Objective

To ensure all waste generated at M5 East is handled and disposed of in an environmentally sound manner.

8.11.2 Legal & Other Requirements

Table 54: Legal and other requirements relating to waste at M5 East

Document	Requirement
MCoA Condition 103	As part of the EMP referred to in Conditions 10 and 13, a detailed Waste Management and Reuse Procedure must be prepared, to the satisfaction of the EPA, to address the management of wastes during both the construction and operation stages. The Procedure must be prepared prior to construction and operation as appropriate and must identify requirements for waste avoidance, reduction, reuse and recycling. It must also detail requirements for handling, stockpiling and disposal of wastes specifically soil, concrete, contaminated soil or water, demolition material, cleared vegetation, oils, greases, lubricants, sanitary wastes, timber, glass, metal etc. It must also identify any site for final disposal of any material and any remedial works required at the disposal site before accepting the material. Any waste material which is unable to be reused, reprocessed or recycled must be disposed at a landfill licensed by the EPA to receive that type of waste. The Procedure must be framed using the waste minimisation hierarchy principles of avoid-reduce- reuse-recycle-dispose.
RMS Sustainability Strategy 2010	Prescribes waste, energy and other environmentally-related requirements and targets.

8.11.3 Goals & Limits

Table 55: Waste and recycling targets for M5 East

Item	Goal
Waste (excluding mulch)	No waste dumped on to land or in waterways
Office paper waste	85% recycled as per RMS sustainability target
Electronic waste (e-waste)	95% of all electronic waste to be sent for reuse, dismantling or recycling

8.11.4 Control Mechanisms

Site waste will be managed using the waste management hierarchy of:

- Avoid waste generation
- Reduce waste generation
- Reuse waste where possible
- Maximise recycling rates
- Dispose of waste for landfill

Table 56: M5 East procedures relating to waste and recycling*

Document	Title
M5E-ENV-13	Waste management

*Environmental procedures are available via the NEWCO intranet page 'Our Way'

8.11.5 Monitoring & Measurement

Monitoring of waste generation, recycling, reuse and disposal will be conducted by tracking of waste sent off-site. Records maintained include waste transfer docket and the maintenance of the M5 East Waste Register.

☞ *Refer: M5 East Waste Register (MS Excel spreadsheet)*

8.12 **Energy Consumption**

8.12.1 Objective

To ensure energy is consumed in a sustainable manner.

8.12.2 Goals & Limits

- Minimise energy use at all times
- Identify energy saving opportunities and consider/investigate feasibility for implementation

8.12.3 Control Mechanisms

Ensure that all plant and machinery is well maintained and running efficiently. Only use plant and machinery where necessary and in line with the operating requirements of the client. When plant and machinery is not being used it should be switched off where allowable.

Ensure for the operational offices equipment, lighting, heating and air-conditioning are used as efficiently as possible and switched off when not being used.

Procedures relating to minimising peak energy demand and operating efficiently are found within the Operation and Maintenance Plan

8.12.4 Monitoring & Measurement

Energy use will be monitored and recorded on a monthly basis through GEEM reporting.

☞ *Refer: M5 East GEEM Plan*

☞ *Refer: M5 East Sustainability Plan*

☞ *Process: GEEM Reporting*

Annexure 1: RMS G36 (2006) & AS/NZS ISO 14001:2004 Compliance Matrix

ISO 14001	RMS G36	Requirement	OEMP Reference
General Requirements			
4.1	3.1	Develop, implement and maintain for the duration of the Contract, a Contractor's Environmental Management System (CEMS) that meets the requirements of the NSW Government Environmental Management System Guidelines.	Section 3
4.2	3.1(i)	Your CEMP must include an Environmental Policy that contains a commitment to the principles of Ecologically Sustainable Development as detailed in the Protection of the Environment Administration Act 1991 (NSW).	Section 3.1
4.1	3.1(ii)	Your CEMP must describe all relevant elements of, and include references to, the CEMS documentation and how these will apply to the Work Under the Contract.	Section 3.2
4.1	3.1(iii)	Your CEMP must address all aspects and stages of the Work Under the Contract.	Section 1.2, 2.1
Planning			
4.3.1	3.2.1	Review the environmental risk assessment regularly to ensure it remains relevant for the duration of the Work Under the Contract.	Section 3.3
4.3.2	3.2.2	The CEMP must identify your obligations under environmental legislation that are relevant to the Work Under the Contract, including those listed in Annexure M.	Section 4
4.3.2	3.2.2	Ascertain from the appropriate authorities what other approvals, licenses and permits are required for the Work Under the Contract.	Section 4.1
4.3.2	3.2.2	Obtain each necessary approval, license and permit not obtained by the Principal prior to the commencement of any work which relates to that approval, license, notification or permit. Include copies of such approvals, licenses and permits in the CEMP.	Section 4.1
-	3.2.2	Include in your CEMS a compliance tracking program and keep the program up to date.	Section 3
4.3.3	3.2.3	Include in the CEMP environmental objectives and targets for the Work Under the Contract which must be consistent with RMS Environment Policy Statement. The environmental objectives and targets must be measurable where practicable, are realistic and relevant to the Work Under the Contract, and include a commitment to continuous improvement of your CEMS.	Section 3.4
4.4.6	3.2.4	Prepare EWMS and implement them as part of the Work Under the Contract. Develop the EWMS in consultation with the relevant site management personnel to ensure that all issues are addressed, methods and activities are practical and all personnel are aware of their commitments and responsibilities. Review the EWMS periodically to ensure its effectiveness and proper implementation and incorporate any improvements or changes identified into subsequent revisions.	Section 3.2

M5 East Operational Environmental Management Plan (OEMP)

ISO 14001	RMS G36	Requirement	OEMP Reference
4.4.1	3.3	Provide sufficient resources, including site personnel, for the effective implementation of the CEMP for the duration of the Work Under the Contract.	Section 5.1
Implementation			
-	3.4	Include environmental management requirements in the planning, selection and management of subcontractors. Include a requirement to comply with the CEMP in all contractual arrangements with your subcontractors.	Section 5.4
4.4.2	3.5	The CEMP must include a site-specific environmental induction and training plan that describes the minimum level of training, experience and/or qualifications required for staff and subcontractors working on the Site, the names of the persons to be trained, the proposed frequency of training and the procedures for training.	Section 5.2.1
-	3.6	The CEMP must include a procedure for notifying the Principal, all relevant Authorities and the community, in advance of any proposal to work outside of these working hours.	Section 8.2.4
4.4.3	3.7	Describe in the CEMP the processes for external and internal communication in relation to the environmental aspects of the Work Under the Contract. Make all staff and subcontractors working on the Site aware of these external and internal communications procedures and are properly trained in their application.	Sections 5.2.4 & 5.3 Community Relations Plan
4.4.3	3.7	Within one (1) working day of receiving a complaint about any environmental issue, including any pollution incidents, arising from the Work Under the Contract, submit a written report to the Principal detailing the complaint and the action taken to remedy the problem. A final report together with your proposed measures to prevent the recurrence of such incidents must be submitted to the Principal within five (5) working days.	Section 5.3.3
4.4.7	3.8	The CEMP must include details of: (a) your key emergency response personnel, their respective responsibilities and contact details including all-hours contact telephone numbers; (b) emergency services (e.g. ambulance, fire brigade, spill clean-up services); (c) your communication strategy, both internal and external (refer to Clause 3.7), during emergencies; (d) any identified potential environmental emergencies that may occur on Site, and the response procedures for these emergencies; and (e) frequency of tests of the emergency response procedures.	Section 5.5
Monitoring, Inspection & Auditing			
4.5.2	3.9	Include in the CEMP procedure(s) to monitor and measure, on a regular basis, your environmental management performance and to evaluate compliance with this Specification. The procedures must contain the scope, methodology and responsibilities for its implementation.	Section 4.3
4.5.1	3.9	Undertake regular site environmental inspections to assess the adequacy and effectiveness of your environmental controls. The site environmental inspections must cover the following: (i) high risk activities	Section 4.3.1

M5 East Operational Environmental Management Plan (OEMP)

ISO 14001	RMS G36	Requirement	OEMP Reference
		and processes; (ii) work in environmentally sensitive areas; and (iii) site preparedness for adverse weather conditions, including adequacy of environmental controls and availability of emergency equipment.	
4.5.5	3.9	Include in the CEMP a risk-based auditing program to verify that the Work Under the Contract meets the requirements of this Specification. The program must specify the type of audits to be conducted, their scope and their frequency.	Section 4.3.2
4.5.3	3.10	Procedures shall be established that: (i) provide for identification and notification of environmental nonconformities, (ii) investigate nonconformities and determine containment measures, clean-up and restoration actions, as well as rectification of deficient environmental protection measures, and (iii) define responsibility and authority for control of environmental nonconformities.	Section 4.3.4
4.5.4	3.11	Maintain legible environmental records of all environmental activities associated with Work Under the Contract to demonstrate compliance with the CEMS and CEMP. You must hold these records for at least five years after the Actual Completion Date, and must make these records available to the Principal and authorised EPA officers upon request.	Section 6.4
Management Review			
4.6	3.12	Develop a documented process to periodically review the effectiveness and proper implementation of the CEMP. The management review process must identify opportunities for continual improvement of your environmental management processes and practices, and ensure that the CEMS and CEMP remain relevant to the Work Under the Contract. The management reviews must be undertaken at least quarterly and must include the Principal's participation.	Section 7.1
Operational Control			
4.4.6	4.1	CEMP must describe potential environmental effects, protection measures and control procedures for the following: soil and water management	Sections 8.4, 8.5, 8.6 & 8.9
4.4.6	4.2	CEMP must describe potential environmental effects, protection measures and control procedures for the following: contaminated land	Section 8.9
4.4.6	4.3	CEMP must describe potential environmental effects, protection measures and control procedures for the following: spill prevention and response	Sections 5.5.4 & 8.5.4
4.4.6	4.4	CEMP must describe potential environmental effects, protection measures and control procedures for the following: air quality	Section 8.1
4.4.6	4.5	CEMP must describe potential environmental effects, protection measures and control procedures for the following: fire safety and burning off	Section 5.5 & 8.7 Incident Response Plan

M5 East Operational Environmental Management Plan (OEMP)

ISO 14001	RMS G36	Requirement	OEMP Reference
4.4.6	4.6	CEMP must describe potential environmental effects, protection measures and control procedures for the following: noise control	Section 8.2
4.4.6	4.7	CEMP must describe potential environmental effects, protection measures and control procedures for the following: ground vibration and airblast	N/A
4.4.6	4.8	CEMP must describe potential environmental effects, protection measures and control procedures for the following: biodiversity	Section 8.8
4.4.6	4.9	CEMP must describe potential environmental effects, protection measures and control procedures for the following: Aboriginal heritage	Section 8.10
4.4.6	4.10	CEMP must describe potential environmental effects, protection measures and control procedures for the following: non-Aboriginal heritage	Section 8.10
4.4.6	4.11	CEMP must describe potential environmental effects, protection measures and control procedures for the following: waste management and resource recovery	Section 8.11
4.4.6	4.12	CEMP must describe potential environmental effects, protection measures and control procedures for the following: use of pesticides	Section 8.7.4
4.4.6	4.13	CEMP must describe potential environmental effects, protection measures and control procedures for the following: work in environmentally sensitive areas	Section 8.8
4.4.7	4.14	Prepare and include in the CEMP an environmental incident reporting and investigation procedure.	Section 5.4

Annexure 2: Applicable Legislation & Other Requirements

Title	Year	Relevance to M5 East
Legislation - Commonwealth		
National Environment Protection Measures (Implementation) Act	1998	Ensuring the community has access to relevant and meaningful information about pollution, e.g. publishing of air quality data on the internet.
National Greenhouse & Energy Reporting Act (NGER Act)	2007	NEWCO must report monthly GHG emissions from all sites and activities to RMS.
Legislation - NSW		
Protection of the Environment Operations Act	1997	Project must notify NSW EPA in the event of a notifiable incident.
Protection of the Environment Operations Amendment Act	2011	Project must notify NSW EPA in the event of a notifiable incident.
Protection of the Environment Operations (General) Regulation	2008	Details requirements for notification of pollution incidents.
Protection of the Environment Operations (Clean Air) Regulation	2010	Sets maximum limits on emissions from activities and plant for a number of substances, including oxides of nitrogen, smoke, solid particles, chlorine, dioxins, furans and heavy metals.
Protection of the Environment Operations (Waste) Regulation	2005	Makes special requirements relating to asbestos and clinical waste.
Environmental Planning and Assessment Act	1979	Project must comply with all Minister's Conditions of Approval.
Environmental Planning and Assessment Regulation	2000	If an activity is expanded or extended, development consent (i.e. REF) may be required for the expanded or extended activity.
Local Government Act	1993	Project will consult with Local Government Authorities over relevant project activities.
Contaminated Land Management Act	1997	Project is required to identify report and manage any identified land contamination in accordance with the Act.
Ozone Protection Act	1989	Stipulates requirements for handling of air-conditioning gases for the prevention of release of ozone depleting substances.
Sydney Water Act	1989	Stipulates requirements for water use approval and licensing.
Waste Avoidance and Resource Recovery Act	2001	Project must reduce waste generation.
Dangerous Goods Act	1975	Project must obtain license where storage of dangerous goods for operations and maintenance is in licensable quantities.
Heritage Act	1977	Project must notify Heritage Council in the event of a notifiable discovery.

M5 East Operational Environmental Management Plan (OEMP)

Title	Year	Relevance to M5 East
Noxious Weeds Act	1993	Project must control weeds as required on lands under the control their control.
Other Requirements (e.g. Standards, Codes of Practice, Guidelines, etc.)		
AS/NZS ISO 31000:2009 Risk Management - Principles and guidelines	2009	Stipulates risk management requirements.
AS/NZS ISO14001:2004 Environmental management systems	2004	Stipulates environmental management system requirements.
ANZECC/ARMCANZ Australian Guidelines for Water Quality Monitoring and Reporting	2000	Stipulates water quality monitoring and reporting requirements.
ANZECC/ARMCANZ Australian and New Zealand Guidelines for Fresh and Marine Waters	2000	Stipulates water quality limits/thresholds for fresh and marine waters.
NSW Government Floodplain Management Manual	2001	Provides guidance on managing floodwaters in flood-prone areas of M5 East.
NSW Government Best Practice Guidelines for Contaminated Water Retention and Treatment Systems	1994	Applicable for management of the water treatment plant (DAF).
NSW Government NSW Department of Housing, 'Managing for Urban Stormwater: Soils and Construction, 3 rd Edition	1998	Applicable for management of erosion and sedimentation.
NSW Government Environment Protection Manual for Authorised Officers - Bunding and Spill Management	-	Applicable for the management of chemicals and hydrocarbons stored and used on site.
RMS Code of Practice for Water Management	1999	Stipulates water quality management requirements for roads/motorways.
RMS Environmental Noise Management Manual	2001	Stipulates noise monitoring and management requirements.
NSW EPA Waste Classification Guidelines	2009	Guidelines for classifying waste generated on site to enable correct disposal measures.
NSW Government Resource Efficiency Policy (GREP)	2014	Replaces WRAPP. Stipulates waste reporting requirements required by RMS.

Annexure 3: Roles & Responsibilities (detailed)

Role	Responsibility
Operations & Maintenance Manager	<ul style="list-style-type: none"> Responsible for compliance with all applicable environmental legislation and contract obligations
Asset & Maintenance Manager	<ul style="list-style-type: none"> Lead and manage the delivery of operations/maintenance process, in relation to environmental management across all sites Reports to the Operations & Maintenance Manager
Maintenance Superintendant	<ul style="list-style-type: none"> Manages maintenance in relation to the environmental management for the site Reports to the Asset & Maintenance Manager Delegates to site personnel
Environment & Community Manager	<ul style="list-style-type: none"> Work with the Project Team in regards to achieving environmental outcomes of the Project, including compliance and sustainability objectives; Prepare the Project CEMP (including associated documentation) and implement the project EMS; Liaise and consult with RMS, DPI, regulatory agencies and other relevant stakeholders Ensure all environmental statutory obligations and requirements are met; Facilitate environmental training/induction; Respond to all environmental incidents; Manage environmental sub-consultants; Prepare documentation to demonstrate compliance and report on compliance; Conduct site inspections and system environmental audits; Ensure corrective actions are implemented; Stop work immediately if an unacceptable impact is likely to occur or to require other reasonable steps to be taken to avoid or minimise any adverse impacts. In the event of stopping works, RMS shall be informed immediately; and Responsible for advising applicable members of the Project Team of complaints received pertaining to environmental management or misuse and facilitating the resolution of complaints and keeping the community informed of operation and maintenance activities Managing the environmental monitoring program e.g. air, water, waste etc, in compliance with legislation and the Ministers Conditions of Approval
ICMS Manager Manger	<ul style="list-style-type: none"> Responsible for ensuring site inductions for all workers and visitors which includes a component on environmental management and site rules Responsible for leading the development of SOP Manages quality systems and compliance Reports to the Operations and Maintenance Manager
All (including subcontractors)	<ul style="list-style-type: none"> Conduct work activities according to SOP's and other procedures (including all environmental management requirements) Report all environmental incidents and issues (actual and potential)

Annexure 4: M5 East Site-Specific Environmental Procedures

Document №	Title
M5E-ENV-01	Noise
M5E-ENV-02	Monitoring of Water Containment Ponds
M5E-ENV-03	Maintenance of Water Containment Ponds
M5E-ENV-04	Tunnel Wash Water
M5E-ENV-05	Fire Fighting Water
M5E-ENV-06	Spill Handling Procedure
M5E-ENV-07	Tunnel Air Quality Management
M5E-ENV-08	Maintenance of Frog Corridor
M5E-ENV-09	Protection of CRX Clay Plain Scrub Forest
M5E-ENV-10	Settlement Monitoring
M5E-ENV-11	Handling & Disposal of Contaminated Soil
M5E-ENV-12	In-Tunnel CO Operating Requirements
M5E-ENV-13	Waste Management Plan
M5E-ENV-14	Operational Traffic Noise Monitoring
M5E-ENV-15	Air Quality Monitoring
M5E-ENV-16	Weed Spraying
M5E-ENV-17	Water Treatment Plan Sampling
M5E-ENV-18	In-Tunnel Air Quality Incident Reporting
M5E-ENV-19	Ambient Air Quality Incident Reporting
M5E-ENV-20	Finding & Reporting Wildlife on M5 East
M5E-ENV-21	Discharging Water into Bardwell Creek from Pump Pit 2
M5E-ENV-22	Maintaining the Water Treatment Plant during Closures
M5E-ENV-23	Unexpected Discovery of Asbestos
M5E-ENV-24	Environmental Impact Assessment

Annexure 5: M5 East Environmental Management Tools

OEMP Element	Title
Legal & Other Requirements	M5 East Obligations Register, Envirolaw (online)
Risk Management	ARM (database)
Incident Management	Cintellate (database)
Document Control	InCITE (online)
Calibration	Maximo, and spreadsheet on K: drive
Hazardous Substances	ChemAlert (online)
Monitoring (scheduling/records)	Maximo (asset management)
Audits (scheduling/records)	Cintellate (database)
Inspections (scheduling/records)	Maximo (asset management)
Waste	M5 East Waste Register
Energy & Greenhouse	GEEM (Oracle)
Water	Forms: <ul style="list-style-type: none"> • Chain of Custody Form (CoC) • Surface Water Quality Monitoring (DAF) • Surface Water Quality Monitoring (DAF & Creek) • Water Quality Pond 6-Monthly Sampling
Landscaping & Rehabilitation	Maximo (asset management)

Annexure 6: Glossary

Term	Definition
NO _x	Nitrogen oxides
PM	Particulate matter
SOP	Standard Operating Procedure (previously 'Safety Health & Environmental Work Method Statement' or SHEWMS)
RMS	Roads & Maritime Services
NEWCO	LS NewCo Proprietary Limited
EPA	Environment Protection Authority
EPL	Environment Protection License
DPI	Department of Planning & Infrastructure
MCoA	Minister's Conditions of Approval
EMS	Environmental Management System
PIRMP	Pollution Incident Response Management Plan