

Appendix D

Construction Environmental Management Framework

CONSTRUCTION ENVIRONMENTAL MANAGEMENT FRAMEWORK

> August 2017

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1. Introduction

1.1 Purpose and Scope

This Construction Environmental Management Framework (CEMF) is a Sydney Metro project framework which sets out the environmental, stakeholder and community management requirements for construction. It provides a linking document between the planning approval documentation and the construction environmental management documentation to be developed by the Principal Contractors relevant to their scope of works.

Sydney Metro Principal Contractors will be required to implement and adhere to the requirements of this CEMF. The requirements of this CEMF will be included as a contract document in all design and construction contracts.

1.2 Status

This is a controlled document, please refer to the version register below which is updated as required.

Version	Description	Date
1.0	For EIS 1	4 April 2012
1.1	For EIS 1 Submissions Report	26 July 2012
1.2	For EIS 2 and the Rapid Transit Rail Facility (RTRF)	31 October 2012
1.3	Updated to incorporate all planning approvals, including ECRL conversion Part 5 approvals	11 July 2014
3.0	Updated to encompass the scope of Sydney Metro – Chatswood to Sydenham EIS	16 February 2016
3.1	Updated for - Chatswood to Sydenham Submissions Report and Preferred Infrastructure Report	15 August 2016
3.2	Updated for – Sydenham to Bankstown EIS	25 August 2017

Previous versions of the CEMF (shown above) still apply to their respective works packages and form part of the contract requirements for the relevant Principal Contractors. The CEMF will continue to be updated and form part of future contract requirements for Sydney Metro works packages.

1.3 Environment and Sustainability Policy

Transport for NSW (TfNSW) has developed an Environment and Sustainability Policy (Appendix A) for the Sydney Metro Delivery Office (SMDO). Principal Contractors will be required to undertake their works in accordance with this policy. The policy reflects a commitment in the delivery of the project to:

- Align with, and support, Transport for NSW (TfNSW) Environment & Sustainability Policy.
- Optimise sustainability outcomes, transport service quality, and cost effectiveness.
- Develop effective and appropriate responses to the challenges of climate change, carbon management, resource and waste management, land use integration, customer and community expectation, and heritage and biodiversity conservation.
- Be environmentally responsible, by avoiding pollution, enhancing the natural environment and reducing the project ecological footprint, while complying with all applicable environmental laws, regulations and statutory obligations.
- Be socially responsible by delivering a workforce legacy which benefits individuals, communities, the project and industry, and is achieved through collaboration and partnerships.

1.4 Project Description

The New South Wales (NSW) Government is implementing Sydney's Rail Future, a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future.

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro Northwest (previously known as the North West Rail Link) and Sydney Metro City & Southwest. The proposed Sydney Metro network is shown in Figure 1-1.

The proposed Sydney Metro City & Southwest (SM C&SW) comprises two core components:

- The Chatswood to Sydenham project (the project), which is the subject of this Environmental Impact Statement. The project would involve construction and operation of an underground rail line, about 15.5 kilometres long, and new stations between Chatswood and Sydenham.
- The second core component would involve upgrading the 13.5 kilometre rail line and existing stations from Sydenham to Bankstown which will be subject to a separate environmental assessment process.

Investigations have started on the possible extension of Sydney Metro from Bankstown to Liverpool. The potential extension would support growth in Sydney's south west by connecting communities, businesses, jobs and services as well as improving access between the south west and Sydney's CBD. It would also reduce growth pressure on road infrastructure and the rail network, including the potential to relieve crowding on the T1 Western Line, T2 South Line and T2 Airport Line.

The SMDO has been established as part of Transport for NSW to manage the planning, procurement and delivery of the Sydney Metro network.



Figure 1 1 The Sydney Metro network

2. Legislative and Other Requirements

The key environmental obligations to be addressed are contained within:

- Legislative requirements.
- Project approval documentation.
- Conditions of Approval.
- Environment Protection Licences.
- Other permits, approval and licences.
- Standards and guidelines.

2.1 Key Legislative Requirements

Table 1.1 below identifies key NSW environmental legislative requirements and their application to SM C&SW construction works, current as at the date of this document. TfNSW and its Contractors should regularly review their legislative requirements.

Table 1.1 NSW Legislative Requirements

Legislation and Administering Authority	Requirements	Application to Sydney Metro
Contaminated Land Management Act 1997 NSW Environment Protection Authority (EPA)	The Act provides a process for the investigation and remediation of land where contamination presents a significant risk of harm to human health or some other aspect of the environment.	TfNSW must follow the process where contaminated land is identified.
Dangerous Goods (Road and Rail Transport) Act 2008 EPA / SafeWork NSW	A licence is required for the storage (SafeWork NSW) and /or transport (EPA) of prescribed quantities of dangerous goods.	Sydney Metro Principal Contractors must obtain a licence where storage of dangerous goods would exceed licensable quantities.
Environmental Planning and Assessment Act 1979 Department of Planning and Environment (DP&E)	Encourages proper environmental impact assessment and management of development areas for the purpose of promoting the social and economic welfare of the community and a better environment.	TfNSW must adhere to mitigation measures and conditions within the planning approval documentation. The proponent and their contractors must endeavour to deliver in a consistent manner within the assessed scope of works.
Fisheries Management Act 1994 Department of Primary Industries (Fisheries)	The relevant objectives of the Act are to conserve threatened species, populations and ecological communities and promote ecologically sustainable development, including the conservation of biological diversity.	Sydney Metro projects assessed under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from permits required under sections 201, 205 or 219.

Legislation and Administering Authority	Requirements	Application to Sydney Metro
Heritage Act 1977 NSW Office of Environment and Heritage (OEH)	The Act aims to encourage the conservation of the State's heritage and provides for the identification and registration of items of State heritage significance.	Sydney Metro projects assessed under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from approvals required under Part 4 and permits required under section 139.
National Parks and Wildlife Act 1974 OEH	The objectives of the Act are for the conservation of nature and the conservation of objects, places or features (including biological diversity) of cultural value within the landscape.	Sydney Metro projects assessed under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from obtaining an Aboriginal Heritage Impact Permit required under section 90.
Native Vegetation Act 2003 OEH	The objective of the Act is to protect and improve the value of native vegetation.	Sydney Metro projects assessed under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from section 12 authorisation to clear native vegetation.
Noxious Weeds Act 1993 Department of Primary Industries	The Act aims to prevent the introduction of new weeds and restrict the spread of existing weeds.	Sydney Metro Principal Contractors must control weeds as required on land under the management of the Contractor.
Protection of the Environment Operations Act 1997 EPA	The relevant objective of the Act is to prevent environmental pollution.	Where Sydney Metro projects are scheduled activities under Schedule 1 of the Act an Environment Protection Licence (EPL) must be obtained. Further details on the requirements to obtain an EPL are provided in Section 2.3.
Roads Act 1993 Roads and Maritime Service	The relevant objective of the Act is to regulate the carrying out of various activities on public roads.	Sydney Metro Principal Contractors must obtain consent under section 138 for carrying out work in, on or over a public road, or digging up or disturbance of the surface of the road.
Waste Avoidance and Resource Recovery Act 2001 EPA	The objectives of the Act are to reduce environmental harm and provide for the reduction in waste generation.	Sydney Metro Principal Contractors must implement strategies to reduce waste volumes and report on waste generated.

Legislation and Administering Authority	Requirements	Application to Sydney Metro
Water Management Act 2000 NSW Office of Water	The relevant objective of the Act is to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality.	Sydney Metro projects assessed under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) are exempt from obtaining water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91.

Table 1.2 identifies key Commonwealth environmental legislative requirements and their application to SM C&SW construction works, current as at the date of this document. TfNSW and its Contractors should regularly review their legislative requirements.

Table 1.2 Commonwealth Legislative Requirements

Legislation and Administering Authority	Requirements	Application to Sydney Metro
Environment Protection and Biodiversity Conservation Act 1999 Department of the Environment	The relevant objective of the Act is to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance.	A project may be defined as a controlled action under the Act due to impacts on matters of national environmental significance.
National Greenhouse and Energy Reporting Act 2007 Department of Climate Change and Energy Efficiency	The Act established a framework for reporting of greenhouse gas emissions, abatement actions, energy consumption and production data.	Sydney Metro Principal Contractors must report on greenhouse gas and energy usage data as required by the Act.

2.2 Environmental Approvals

Sydney Metro Northwest is classified as Critical State Significant Infrastructure and was approved under the following in accordance with Section 115W of the Environmental Protection and Assessment Act 1997:

- Staged State Infrastructure Approval (1 October 2011, modified on 25 September 2012)
- Stage 1 – Major Civil Construction Works (25 September 2012, modified on 18 April 2013)
- Stage 2 – Stations, Rail Infrastructure and Systems (8 May 2013, modified on 20 May 2014).

Some components of Sydney Metro Northwest (such as the conversion of the Epping to Chatswood component of the project) have also been approved under Part 5 of the Environmental Protection and Assessment Act, in which case TfNSW is the consent authority.

Sydney Metro City and Southwest is also classified as Critical State Significant Infrastructure and requires approval from a consent authority under the requirements of the Environmental Protection and Assessment Act 1997 (Section 115W).

Two separate approvals are sought:

- Sydney Metro City and Southwest – Chatswood to Sydenham (Approved January 2017)
- Sydney Metro City and Southwest - Sydenham to Bankstown

The requirements of the approval are required to be complied with by TfNSW. Responsibility for implementing mitigation measures and conditions of approval will be allocated between TfNSW and Principal Contractors as appropriate. Typically TfNSW will produce a Staging Report which sets out the applicability and allocation of approval requirements within the project's program of works.

2.3 Environment Protection Licence Requirements

Sydney Metro projects often meet the definition of a number of scheduled activities under Schedule 1 of the *Protection of the Environment Operation Act 1997* (POEO Act) and as such our contractors may be required to obtain an Environment Protection Licence (EPL) or work under the existing EPL held by Sydney Trains.

Where required, Sydney Metro Principal Contractors will:

- a. Apply for and be granted an EPL from the EPA.
- b. Hold an EPL which covers their scope of works as necessary under the POEO Act.
- c. Undertake their scope of works in accordance with the conditions of the applicable EPLs as issued by the EPA.
- d. Work under the existing Sydney Trains EPL.

2.4 Standards and Guidelines

Numerous environmental publications, standards, codes of practice and guidelines are relevant to TfNSW construction and are referenced throughout this Construction Environmental Management Framework. A summary of these applicable standards and guidelines is provided in Table 1.3.

Table 1.3 Environmental Standards and Guidelines

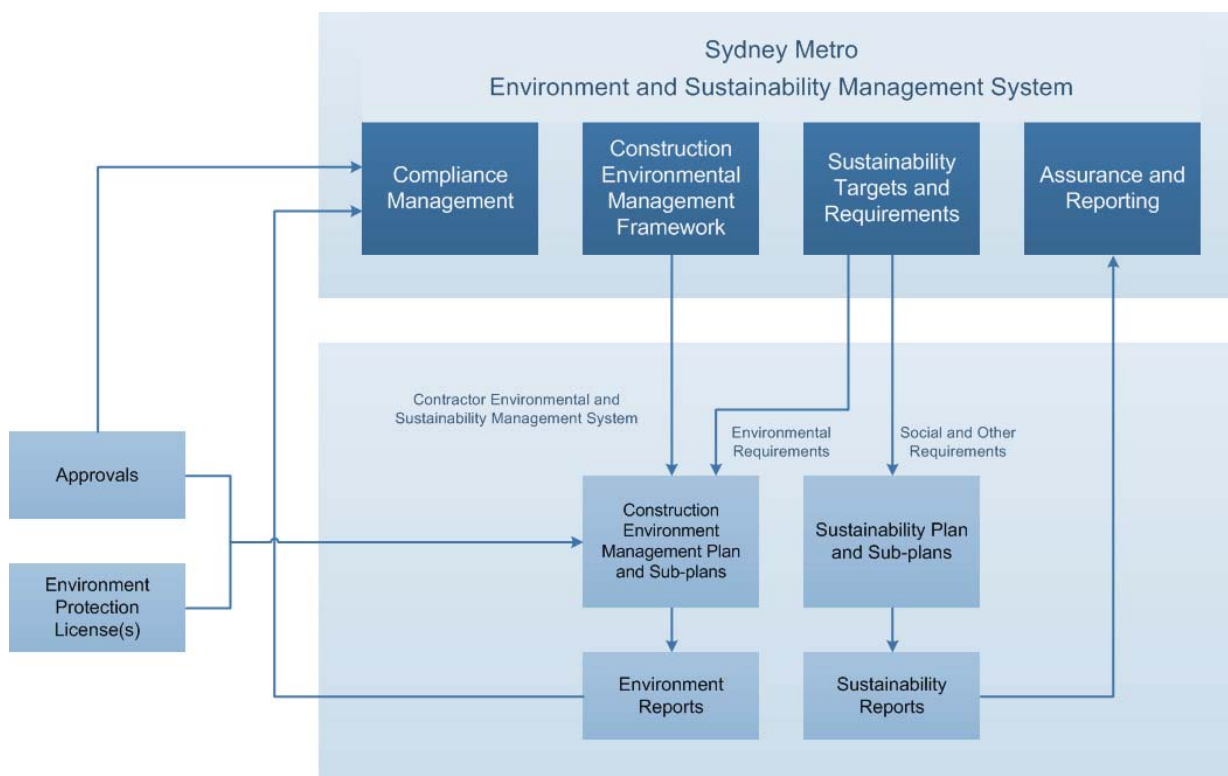
Standard / Guideline	Relevant Authority	CEMF Reference
ISO14001 Environmental Management System – Requirements with Guidelines for Use	DP&E	Section 3.1
Interim Construction Noise Guidelines (Department of Environment and Climate Change, 2009)	EPA	Section 9.2
Managing Urban Stormwater: Soil and Construction (Landcom, 2008)	EPA	Section 15.2
AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting	OEHL	Section 12.2
Waste Classification Guidelines (Department of Environment, Climate Change and Water, 2008)	EPA	Section 17.2
AS 1742.3 Manual of uniform traffic control devices Part 3: Traffic control for works on roads	RMS	Section 8.2
RMS Traffic Control at Worksites Manual	RMS	Section 8.2
Australian and New Zealand Guidelines for Fresh and Marine Water Quality	ANZECC	Section 15.2

3. Environmental Management Requirements

3.1 Environmental and Sustainability Management System

- a. Principal Contractors are required to have a corporate Environmental Management System certified under AS/NZS ISO 14001:2004 and to have transitioned this accreditation into AS/NZS ISO 14001:2015 by September 2018.
- b. Principal Contractors are required to develop a project based Environment and Sustainability Management System (E&SMS). The E&SMS will:
 - i. Be consistent with the Principal Contractors corporate Environmental Management System and AS/NZS ISO 14001:2004 or 2015;
 - ii. Be supported by a process for identifying and responding to changing legislative or other requirements;
 - iii. Include processes for assessing design or construction methodology changes for consistency against the planning approvals;
 - iv. Include processes for tracking and reporting performance against sustainability and compliance targets;
 - v. Include a procedure for the identification and management of project specific environmental risks and appropriate control measures; and
 - vi. Be consistent with the SM C&SW Sustainability Strategy and Sydney Metro Environment and Sustainability Policy.
- c. All sub-contractors engaged by the Principal Contractor will be required to work under the Principal Contractor's E&SMS.
- d. The relationship between key documents within the Sydney Metro Environment and Sustainability Management System and the Principal Contractor's Environment and Sustainability Management System is shown in Figure 2.
- e. The Principal Contractors Sustainability Plan and its sub plans will capture governance and design requirements as well as social sustainability initiatives as required by the Sydney Metro Sustainability Strategies.
- f. These plans vary in scope across different delivery packages.

Figure 2 - Environmental Management and Sustainability Structure



3.2 Construction Sustainability Management Plan

- a. Principal Contractors are required to prepare and implement a Sustainability Management Plan (SMP) relevant to the scale and nature of their scope of works. The SMP shall comprise of a main SMP document and issue-specific sub-plans.
- b. Depending on the scope and scale of the works, TfNSW may decide to streamline the SMP and sub-plan requirements. As a minimum the SMP will address and detail:
 - i. The requirements of the relevant planning approval documentation, any relevant conditions of all other permits and licences, the Contractor's corporate EMS, the sustainability provisions of the contract documentation, and this Construction Environmental Management Framework;
 - ii. The sustainability management team structure, including key personnel authority and roles of key personnel, lines of responsibility and communication, minimum skill levels of each role and interfaces with the overall project organisation structure;
 - iii. A sustainability policy statement and strategies for adaptation to climate change, resource management (including energy, water and waste), workforce development, procurement and biodiversity enhancement;
 - iv. Sustainability initiatives to be implemented during the project;
 - v. How sustainability initiatives will be identified and implemented;
 - vi. The processes and methodologies for assurance, monitoring, auditing, corrective action, continuous improvement and reporting on sustainability performance;

- vii. The processes and methodologies which will be used to achieve the required scores under rating systems identified in contract documents;
 - viii. The processes and procedures for undertaking climate change risk assessments;
 - ix. The processes and procedures for the identification and implementation of climate change adaption measures;
 - x. The approach to sustainable procurement including:
 - ♦ The processes and procedures that will be used to provide environmental and social improvement;
 - ♦ The processes and environmental and social criteria that will be used for the selection of Subcontractors;
 - ♦ The processes that will be used to ensure ethical sourcing of labour and materials;
 - ♦ Where equipment, materials or labour are procured from locations outside Australia, the processes that will be used to ensure human rights impacts and risks are identified and mitigated; and
 - ♦ Interfaces with other Project Plans.
- c. Depending on the scope of the works, the SMP will also include, as a separate sub-plans:
- i. A Construction Workforce Development Plan;
 - ii. A Construction Carbon and Energy Management Plan;
 - iii. A Materials Management Plan; and
 - iv. A Waste Management & Recycling Plan.
- d. The Workforce Development Plan will address and detail:
- i. The proposed response to workforce-related regulatory, planning approval, and contract requirements which will be addressed for the project;
 - ii. The workforce development team structure, including key personnel authority and roles of key personnel, lines of responsibility and communication, minimum skill levels of each role and interfaces with the overall project organisation structure;
 - iii. A description of the workforce development initiatives which will be implemented, and the implementation methodology, including for:
 - ♦ Assessing current and future workforce skill needs and workforce profiles including a skills and workforce gap plan;
 - ♦ Increasing local employment, local business opportunities and involvement of local SMEs;
 - ♦ Provision of relevant Nationally Recognised Accredited Training;
 - ♦ Increasing workforce diversity and inclusion, targeting indigenous workers and businesses, female representation in non-traditional trades and long-term unemployed;
 - ♦ Participation in work placement and education programs for young people; and
 - ♦ Increasing participation of apprentices and trainees.
 - iv. The processes and methodologies for assurance, monitoring, auditing, corrective action, continuous improvement and reporting on workforce development performance.

3.3 Construction Environmental Management Plan

- a. Principal Contractors are required to prepare and implement a Construction Environmental Management Plan (CEMP) relevant to the scale and nature of their scope of works. The CEMP shall comprise of a main CEMP document, issue specific sub plans, activity specific procedures and site based control maps. The CEMP shall illustrate the relationship between other plans required by the contract, in particular those that relate to design management.
- b. Depending on the scope and scale of the works, TfNSW may decide to streamline the CEMP and sub-plan requirements. For example, depending on the risk associated with particular environmental issues it may be appropriate to remove the need for a sub plan, or replace with a procedure as part of the CEMP.
- c. The CEMP will cover the requirements of the relevant planning approval documentation, the conditions of all other permits and licences, the Principal Contractor's corporate EMS, the environmental provisions of the contract documentation and this Construction Environmental Management Framework.
- d. As a minimum the CEMP will:
 - i. Include a contract specific environmental policy;
 - ii. Include a description of activities to be undertaken during construction;
 - iii. For each plan under the CEMP include a matrix of the relevant Conditions of Approval or Consent referencing where each requirement is addressed;
 - iv. For each plan under the CEMP, set objectives and targets, and identify measurable key performance indicators in relation to these;
 - v. For each role that has environmental accountabilities or responsibilities, including key personnel, provide a tabulated description of the authority and roles of key personnel, lines of responsibility and communication, minimum skill level requirements and their interface with the overall project organisation structure;
 - vi. Assign the responsibility for the implementation of the CEMP to the Environment Manager, who will have appropriate experience. The Principal Contractor's Project Director will be accountable for the implementation of the CEMP;
 - vii. Identify communication requirements, including liaison with stakeholders and the community;
 - viii. Include induction and training requirements and a summary of the Training Needs Analysis required in Section 3.9(b);
 - ix. Management strategies for environmental compliance and review of the performance of environmental controls;
 - x. Processes and methodologies for surveillance and monitoring, auditing and review, and reporting on environmental performance including environmental compliance tracking;
 - xi. Include procedures for emergency and incident management, non-compliance management, and corrective and preventative action; and
 - xii. Include procedures for the control of environmental records.
- e. The CEMP and associated sub-plans will be reviewed by TfNSW and/or an independent environmental representative (see Section 3.11) prior to any construction works commencing. Depending on the Conditions of Approval, the CEMP and certain sub-plans may also require the approval of the Department of Planning and Environment (DP&E).

- f. Where a corresponding systems document exists within the Sydney Metro Integrated Management System, the Principal Contractor's procedures will be required to be consistent with any requirements in those documents.

3.4 Construction Environmental Management Sub-Plans

- a. Subject to Section 3.3(b) and Section 3.2(b) the Principal Contractor will prepare issue-specific environmental sub plans to the CEMP and SMP which address each of the relevant environmental impacts at a particular site or stage of the project. Issue specific sub plans will include:
 - i. Spoil management;
 - ii. Groundwater management;
 - iii. Traffic and transport management;
 - iv. Noise and vibration management;
 - v. Heritage management;
 - vi. Flora and fauna management;
 - vii. Visual amenity management;
 - viii. Carbon and energy management;
 - ix. Materials management;
 - x. Soil and water management;
 - xi. Air quality management; and
 - xii. Waste management and recycling.
- b. Additional detail on the minimum requirements for these sub plans is provided in Sections 6-17 of this CEMF.

3.5 Environmental Procedures and Control Maps

- a. The Principal Contractor will prepare and implement activity specific environmental procedures. These procedures should supplement environmental management sub plans, but may substitute for sub plans in agreement with TfNSW if a reasonable risk based justification can be made and the sub plan is not a requirement of any approval.
- b. The procedures will include:
 - i. A breakdown of the work tasks relevant to the specific activity and indicate responsibility for each task;
 - ii. Potential impacts associated with each task;
 - iii. A risk rating for each of the identified potential impacts;
 - iv. Mitigation measures relevant to each of the work tasks; and
 - v. Responsibility to ensure the implementation of the mitigation measures.
- c. The Principal Contractor will prepare and implement site based progressive Environmental Control Maps (ECM's) which as a minimum:
 - i. Is a progressive document depicting a current representation of the site;
 - ii. Indicates which environmental procedures, environmental approvals, or licences are applicable;

- iii. Illustrates the site showing significant structures, work areas and boundaries;
- iv. Illustrates environmental control measures and environmentally sensitive receivers;
- v. Is endorsed by the Principal Contractors Environmental Manager or delegate; and
- vi. Relevant workers will be trained in the requirements of and will sign off the procedures prior to commencing works on the specific site and / or activity.

3.6 Additional Environmental Assessments

- a. Where the requirement for an additional environmental assessment is identified, this will be undertaken prior to undertaking any physical works. The environmental assessment will include:
 - i. A description of the existing surrounding environment;
 - ii. Details of the ancillary works and construction activities required to be carried out including the hours of works;
 - iii. An assessment of the environmental impacts of the works, including, but not necessarily limited to, traffic, noise and vibration, air quality, soil and water, ecology and heritage;
 - iv. Details of mitigation measures and monitoring specific to the works that would be implemented to minimise environmental impacts; and
 - v. Identification of the timing for completion of the construction works, and how the sites would be reinstated (including any necessary rehabilitation).

3.7 Condition Surveys

- a. Prior to the commencement of construction the Principal Contractors will offer Pre-construction Building Condition Surveys, in writing, to the owners of buildings where there is a potential for construction activities to cause cosmetic or structural damage. If accepted, the Principal Contractor will produce a comprehensive written and photographic condition report produced by an appropriate professional prior to relevant works commencing.
- b. Prior to the commencement of construction the Principal Contractor will prepare a Road Dilapidation Report for all local public roads proposed to be used by heavy vehicles.

3.8 Register of Hold Points

- a. Principal Contractors will identify hold points, beyond which approval is required to proceed with a certain activity. Example activities include vegetation removal and water discharge. Hold points will be documented in relevant CEMPs.
- b. Table 1.4 provides the structure for the register of hold points as well as a preliminary list of hold points which will be implemented.

Table 1.4 Preliminary Register of Hold Points

Hold Point	Release of Hold Point	By Who
Prior to Vegetation Clearing / Ground Disturbance	Pre-clearing inspection Erosion and sediment control plan	Qualified Ecologist Contractor's Environmental Manager or delegate
Discharge of water	Water tested to verify compliance and approval to discharge	Contractor's Environment Manager or delegate
Out of hours works	Noise Assessment	Contractor's Environment Manager
Use of local roads by heavy vehicles	Road Dilapidation Report	Appropriate Professional nominated by Principal Contractor
Construction identified as affecting buildings	Building Condition Survey	Appropriate Professional nominated by Principal Contractor

3.9 Training, Awareness and Competence

- a. Principal Contractors will be responsible for determining the training needs of their personnel. As a minimum this will include site induction, regular toolbox talks and topic specific environmental training as follows:
 - i. The site induction will be provided to all site personnel and will include, as a minimum:
 - ♦ Training purpose, objectives and key issues;
 - ♦ Contractor's environmental policy and key performance indicators;
 - ♦ Due diligence, duty of care and responsibilities;
 - ♦ Relevant conditions of any environmental licence and/or the relevant conditions of approval;
 - ♦ Site specific issues and controls including those described in the environmental procedures;
 - ♦ Reporting procedure for environmental hazards and incidents; and
 - ♦ Communication protocols.
 - ii. Toolbox talks will be held on a regular basis in order to provide a project or site wide update, including any key or recurring environmental issues; and
 - iii. Topic specific environmental training should be based upon, but is not limited to, Issue specific sub-plans required under Section 3.4 (a) (i-xi).
- b. Principal Contractors will conduct a Training Needs Analysis which:
 - i. Identifies that all staff are to receive an environmental induction and undertake environmental incident management training;
 - ii. Identifies the competency requirements of staff that hold environmental roles and responsibilities documented within the Construction Environmental Management Plan and sub-plans;
 - iii. Identifies appropriate training courses/events and the frequency of training to achieve and/or maintain these competency requirements; and

- iv. Implements and documents as part of the CEMP a training schedule that plans attendance at environmental training events, provides mechanisms to notify staff of their training requirements, and identifies staff who do not attend scheduled training events or who have overdue training requirements.

3.10 Emergency and Incident Response

- a. Principal Contractors will develop and implement a Pollution Incident Response Management Plan, in accordance with the requirements of the POEO Act. Contractors' emergency and incident response procedures will also be consistent with any relevant SMDO procedures and will include:
 - i. Categories for environmental emergencies and incidents;
 - ii. Notification protocols for each category of environmental emergency or incident, including notification of TfNSW and notification to owners / occupiers in the vicinity of the incident. This is to include relevant contact details;
 - iii. Identification of personnel who have the authority to take immediate action to shut down any activity, or to affect any environmental control measure (including as directed by an authorised officer of the EPA);
 - iv. A process for undertaking appropriate levels of investigation for all incidents and the identification, implementation and assessment of corrective and preventative actions; and
 - v. Notification protocols of incidents to the EPA, DP&E or OEH that are made by the Contractor or TfNSW.
- b. The Contractor will make all personnel aware of the plan and their responsibilities.

3.11 Independent Environmental Representatives

- a. TfNSW will engage Independent Environmental Representatives (ERs) to undertake the following, along with any additional roles as required:
 - i. Review, provide comment on and endorse (where required) any relevant environmental documentation to verify it is prepared in accordance with relevant environmental legislation, planning approval conditions, Environment Protection Licences, relevant standards and this CEMF;
 - ii. Monitor and report on the implementation and performance of the above mentioned documentation and other relevant documentation;
 - iii. Provide independent guidance and advice to TfNSW and the Contractors in relation to environmental compliance issues and the interpretation of planning approval conditions;
 - iv. Be the principal point of advice for the DP&E in relation to all questions and complaints concerning the environmental performance of the project;
 - v. Ensure that environmental auditing is undertaken in accordance with all relevant project requirements; and
 - vi. Recommend reasonable steps, including 'stop works', to be taken to avoid or minimise adverse environmental impacts.

3.12 Roles and Responsibilities

- a. In relation to Roles and Responsibilities the CEMP will:
 - i. Describe the relationship between the Principal Contractor, TfNSW, key regulatory stakeholders, the independent environmental representative and the independent certifier;
 - ii. For each role that has environmental accountabilities or responsibilities, including key personnel, provide a tabulated description of the authority and roles of key personnel, lines of responsibility and communication, minimum skill level requirements and their interface with the overall project organisation structure;
 - iii. Provide details of each specialist environment, sustainability or planning consultant who is employed by the Principal Contractor including the scope of their work; and
 - iv. Provide an overview of the role and responsibilities of the Independent Environmental Representative, the Independent Certifier and other regulatory stakeholders.
- b. All sub-contractors engaged by the Principal Contractor will be required to operate within the EMS documentation of that Principal Contractor.

3.13 Environmental Monitoring, Inspections and Auditing

- a. Issue specific environmental monitoring will be undertaken as required or as additionally required by any approval, permit or licence conditions.
- b. The results of any monitoring undertaken as a requirement of the EPL will be published on the Principal Contractor's, or a project specific, website within 14 days of obtaining the results.
- c. Environmental inspections will include:
 - i. Surveillance of environmental mitigation measures by the Site Foreman; and
 - ii. Periodic inspections by the Principal Contractor's Environmental Manager (or delegate) to verify the adequacy of all environmental mitigation measures. This will be documented in a formal inspection record.
- d. Regular site inspections by the ERs and TfNSW representatives at a frequency to be agreed with the Principal Contractor.
- e. Principal Contractors must undertake internal environmental audits. The scope will include:
 - i. Compliance with any approval, permit or licence conditions;
 - ii. Compliance with the E&SMS, CEMP, SMP, sub-plans and procedures;
 - iii. Community consultation and complaint response;
 - iv. Environmental training records; and
 - v. Environmental monitoring and inspection results.
- f. TfNSW (or an independent environmental auditor) will also undertake periodic audits of the Principal Contractor's E&SMS and compliance with the environmental aspects of contract documentation, including this Construction Environmental Management Framework.

3.14 Environmental Non-compliances

- a. Principal Contractors will document and detail any non-compliances arising out of the above monitoring, inspections and audits. TfNSW will be made aware of all non-compliances in a timely manner.
- b. Principal Contractors will develop and implement corrective actions to rectify the non-compliances and preventative actions in order to prevent a re-occurrence of the non-compliance. Contractors will also maintain a register of non compliances, corrective actions and preventative actions.
- c. TfNSW or the Environmental Representative may raise non-compliances against environmental requirements.

3.15 Environmental Records and Compliance Reporting

- a. Principal Contractors will maintain appropriate records of the following:
 - i. Site inspections, audits, monitoring, reviews or remedial actions;
 - ii. Documentation as required by performance conditions, approvals, licences and legislation;
 - iii. Modifications to site environmental documentation (eg CEMP, sub-plans and procedures); and
 - iv. Other records as required by this Construction Environmental Management Framework.
- b. Records will be retained onsite for the duration of works.
- c. Additionally records will be retained by the Principal Contractor for a period of no less than 7 years. Records will be made available in a timely manner to TfNSW (or their representative) upon request.
- d. Compliance reports detailing the outcome of any environmental surveillance activity including internal and external audits (refer to Section 3.13) will be produced by the Principal Contractors Environmental Manager or delegate. These reports will be submitted to TfNSW at an agreed frequency.

3.16 Review and Improvement of the E&SMS

- a. Principal Contractors will ensure the continual review and improvement of the E&SMS. This will generally occur in response to:
 - i. Issues raised during environmental surveillance and monitoring;
 - ii. Expanded scope of works;
 - iii. Environmental incidents; and
 - iv. Environmental non-conformances.
- b. A formal review of the E&SMS by the Principal Contractor's Senior Management Team will also occur on an annual basis, as a minimum. This review shall generate actions for the continual improvement of the E&SMS and supporting management plans.

4. Stakeholder and Community Involvement

4.1 Overview

- a. Throughout construction, Sydney Metro and the Principal Contractors will work closely with stakeholders and the community to ensure they are well informed regarding the construction works.
- b. Stakeholders and the community will be informed of significant events or changes that affect or may affect individual properties, residences and businesses. These will include:
 - i. Significant milestones;
 - ii. Design changes;
 - iii. Changes to traffic conditions and access arrangements for road users and the affected public; and
 - iv. Construction operations which will have a direct impact on stakeholders and the community including noisy works, interruptions to utility services or construction work outside of normal work hours.

4.2 Community Communication Strategy

- a. A Community Communication Strategy will be developed by each Sydney Metro Principal Contractor.
- b. Key elements of the Community Communication Strategy, which will be implemented at appropriate times in the construction process, will include:
 - i. Notification (including targeted letterbox drops and email) of any works that may disturb local residents and businesses (such as noisy activities and night works) at least seven days prior to those works commencing;
 - ii. Notification (including targeted letterbox drops and email) of works that may affect transport (such as road closures, changes to pedestrian routes and changes to bus stops);
 - iii. Traffic alerts (via email) to all key traffic and transport stakeholders advising of any changes to access and local traffic arrangements (at least seven days prior to significant events);
 - iv. Print and radio advertisements regarding major traffic changes;
 - v. 24-hour toll-free community project information phone line;
 - vi. Complaints management process;
 - vii. Community information sessions, as required;
 - viii. Regular updates to the Sydney Metro website (sydneymetro.info), including uploading of all relevant documents, and contact details for the stakeholder and community relations team;
 - ix. Provision of information to the Sydney Metro Community Information Centre including community newsletters, information brochures and fact sheets and interactive web-based activities;
 - x. Clear signage at the construction sites;
 - xi. Regular newspaper advertisements in local and metropolitan papers;
 - xii. Regular inter-agency group meetings;
 - xiii. Community, business and stakeholder satisfaction surveys and feedback forms;
 - xiv. Translator and interpreter services; and

- xv. The Principal Contractor's Community Relations Team will liaise with the Sydney Metro Project Communications team as the point of contact for the community.

4.3 Complaint Handling

- a. Community liaison and complaints handling will be undertaken in accordance with the Construction Complaints Management System and will include:
 - i. Principal Contractors will deal with complaints in a responsive manner so that stakeholders' concerns are managed effectively and promptly; and
 - ii. A verbal response will be provided to the complainant as soon as possible and within a maximum of two hours from the time of the complaint (unless the complainant requests otherwise). A detailed written response will then be provided, if required, to the complainant within one week.

4.4 Urban Design of Temporary Works

- a. Principal Contractors will ensure as a minimum:
 - i. Temporary construction works consider urban design and visual impacts, including:
 - ♦ Artwork, graphics and images to enhance the visual appearance of temporary works in high visibility locations;
 - ♦ Project information to raise awareness on benefits, explain the proposed works at each site and provide updates on construction progress;
 - ♦ Community information, including contact numbers for enquiries / complaints;
 - ♦ Signage and information to mitigate impacts on local businesses which may be obscured by the construction site;
 - ♦ Sydney Metro advertising / public awareness campaigns; and
 - ♦ Logos / branding, including Sydney Metro, NSW Government, and Contractor branding.
 - ii. The design of all temporary works will require TfNSW approval in relation to urban design and visual impacts and TfNSW will stipulate the design of hoarding artwork, including:
 - ♦ Sydney Metro advertising / public awareness campaigns; and
 - ♦ Logos / branding, including Sydney Metro, NSW Government, and Contractor branding.
- b. Construction hoardings, scaffolding and acoustic sheds will be regularly inspected and kept clean and free of dust build up. Graffiti on construction hoardings, scaffolding or acoustic sheds will be removed or painted over promptly.
- c. The principles of Crime Prevention Through Environmental Design will be applied to all works, including temporary works, that have a public interface.

4.5 Business and Property Impacts

- a. Principal Contractors will proactively work with potentially affected stakeholders to identify the likely impacts and put in place measures to minimise impacts.
- b. Construction works will be undertaken to meet the following objectives:
 - i. Minimise the potential impact of the project to businesses affected by construction works;
 - ii. Ensure businesses are kept informed of the project and consulted in advance of major works or factors that are likely to have a direct impact;
 - iii. Consult with all business directly affected by changes to access arrangements regarding specific requirements at least two weeks prior to those changes coming into effect; and
 - iv. Ensure that business stakeholder enquiries and complaints regarding the project are managed and resolved effectively.
- c. Principal Contractors will document in the Community Communication Strategy (Section 4.2) key issues relating to business impacts by locality with a particular focus on proactive consultation with affected businesses. Including:
 - i. Identification of specific businesses which are sensitive to construction activity disturbances;
 - ii. Summary of the commercial character of the locality, its general trading profile (daily and annually) and information gained from the business profiling such as:
 - ♦ Operating hours;
 - ♦ Main delivery times;
 - ♦ Reliance on foot traffic;
 - ♦ Any signage or advertising that may be impacted;
 - ♦ Customer origin; and
 - ♦ Other information specific to the business that will need to be considered in construction planning.
 - iii. Define the roles and responsibilities in relation to the control and monitoring of business disturbances;
 - iv. Identification of locality specific standard business mitigation measures which would be implemented;
 - v. Maps and diagrams to illustrate the information for easy identification of measures which would be implemented;
 - vi. Description of the monitoring, auditing and reporting procedures;
 - vii. Procedure for reviewing performance and implementing corrective actions;
 - viii. Description of the complaints handling process; and
 - ix. Procedure for community consultation and liaison.

5. General Site Works



Figure 3 - Aerial View of the Sydney Metro Norwest Station Site

5.1 Working Hours

- a. Standard working hours are between 7am – 6pm on weekdays and 8am – 1pm on Saturdays.
- b. Works which can be undertaken outside of standard construction hours without any further approval include:
 - i. Those which have been described in respective environmental assessments as being required to take place 24/7. For example, tunnelling and underground excavations and supporting activities will be required 24/7;
 - ii. Works which are determined to comply with the relevant Noise Management Level at sensitive receivers;
 - iii. The delivery of materials outside of approved hours as required by the Police or other authorities (including RMS) for safety reasons;
 - iv. Where it is required to avoid the loss of lives, property and / or to prevent environmental harm in an emergency; and
 - v. Where written agreement is reached with all affected receivers.
- c. Principal Contractors may apply for EPA approval to undertake works outside of normal working hours under their respective Environment Protection Licences.

5.2 Site Layout

- a. Principal Contractors will consider the following in the layout of construction sites:
 - i. The location of noise intensive works and 24 hour activities in relation to noise sensitive receivers;
 - ii. The location of site access and egress points in relation to noise and light sensitive receivers, especially for sites proposed to be utilised 24 hours per day;
 - iii. The use of site buildings to shield noisy activities from receivers;
 - iv. The use of noise barriers and / or acoustic sheds where feasible and reasonable for sites proposed to be regularly used outside of daytime hours; and
 - v. Aim to minimise the requirement for reversing, especially of heavy vehicles.

5.3 Reinstatement

- a. Mitigation measures for reinstatement will be produced in consultation with TfNSW, the community and stakeholders.
- b. Mitigation measures required for reinstatement will be incorporated into the CEMP and will include as a minimum:
 - i. Principal Contractors will clear and clean all working areas and accesses at project completion;
 - ii. At the completion of construction all plant, temporary buildings or vehicles not required for the subsequent stage of construction will be removed from the site;
 - iii. All land, including roadways, footpaths, loading facilities or other land having been occupied temporarily will be returned to their pre-existing condition or better; and
 - iv. Reinstatement of community spaces, infrastructure and services will occur as soon as possible after completion of construction.

6. Spoil Management



Figure 4 - Spoil and Excavation Works at the Showground Station Site

6.1 Spoil Management Objectives

- a. The following spoil management objectives will apply to the construction of the project:
 - i. Minimise spoil generation where possible;
 - ii. The project will mandate 100% reuse or recycling (on or off-site) of usable spoil;
 - iii. Spoil will be managed with consideration to minimising adverse traffic and transport related issues;
 - iv. Spoil will be managed to avoid contamination of land or water;
 - v. Spoil will be managed with consideration of the impacts on residents and other sensitive receivers; and
 - vi. Site contamination will be effectively managed to limit the potential risk to human health and the environment.

6.2 Spoil Management Implementation

- a. Principal Contractors will develop and implement a Spoil Management Plan for their scope of works. The Spoil Management Plan will include as a minimum:
 - i. The spoil mitigation measures as detailed in the environmental approval documentation;
 - ii. The responsibilities of key project personnel with respect to the implementation of the plan;

- iii. Procedures and methodologies for the haulage and disposal locations, storage and stockpiling arrangements, including those for virgin excavated natural material, contaminated and unsuitable material;
 - iv. Procedures for the testing, excavation, classification, handling and reuse of spoil;
 - v. measures that will be implemented to both reduce spoil quantities and maximise the beneficial reuse of spoil which will be generated during the performance of the TSE Contractor's Activities, including how spoil generation is minimised through the design development process;
 - vi. Details, links or references to where traffic movements in relation to spoil are described, and measures that will be implemented to minimise traffic and noise impacts associated with haulage and disposal of spoil;
 - vii. quantities for reuse of spoil within the Construction Site, for beneficial reuse of spoil off site and for spoil disposal;
 - viii. Processes and procedures for the management of the environmental and social impacts of spoil transfer and reuse;
 - ix. A register of spoil receipt sites that includes the site or project name, location, capacity, site owner and which tier the site is classified as under the spoil reuse hierarchy;
 - x. Spoil management monitoring requirements; and
 - xi. Compliance record generation and management.
- b. Spoil management measures will be included in regular inspections undertaken by the Contractor, and compliance records will be retained. These will include:
- i. Records detailing the beneficial re-use of spoil either within the project or at off-site locations; and
 - ii. Waste dockets for any spoil disposed of to landfill sites.

6.3 Spoil Mitigation

- a. Examples of spoil mitigation measures include:
- i. Implementing the spoil re-use hierarchy;
 - ii. Handling spoil to minimise potential for air or water pollution; and
 - iii. Minimise traffic impacts associated with spoil removal.

7. Groundwater Management

7.1 Groundwater Management Objectives

- a. The following groundwater management objectives will apply to construction:
 - i. Reduce the potential for drawdown of surrounding groundwater resources;
 - ii. Prevent the pollution of groundwater through appropriate controls; and
 - iii. Reduce the potential impacts of groundwater dependent ecosystems.

7.2 Groundwater Management Implementation

- a. The following content may be provided within other sub plans such as the Soil and Water Management Plan and Flora and Fauna Management Plan.
- b. Principal Contractors will develop and implement a Groundwater Management Plan for their scope of works. The Groundwater Management Plan will include as a minimum:
 - i. The groundwater mitigation measures as detailed in the environmental approval documentation;
 - ii. The requirements of any applicable licence conditions;
 - iii. Details of proposed extraction, use and disposal of groundwater, and measures to mitigate potential impacts to groundwater sources, incorporating monitoring, impact trigger definition and response actions for all groundwater sources potentially impacted by the SSI;
 - iv. Evidence of consultation with the NSW Office of Water;
 - v. The responsibilities of key project personnel with respect to the implementation of the plan;
 - vi. Procedures for the treatment, testing and discharge of groundwater from the site;
 - vii. Compliance record generation and management; and
 - viii. Details of groundwater monitoring if required.

7.3 Groundwater Mitigation

- a. Examples of groundwater mitigation measures include:
 - i. Implementing all feasible and reasonable measures to limit groundwater inflows to stations and crossovers; and
 - ii. Undertaking groundwater monitoring during construction (levels and quality) in areas identified as 'likely' and 'potential' groundwater dependent ecosystems.

8. Construction Traffic Management



Figure 5 – Castle Hill Station Site at the Intersection of Old Northern Rd and McMullen Ave

8.1 Construction Traffic Management Objectives

- a. Construction traffic management will be managed using the following documentation, where relevant:
 - i. Construction Traffic Management Plan;
 - ii. Traffic Management Plan (for each work site);
 - iii. Traffic Staging Plan (for road works);
 - iv. Traffic Control Plan (for road works);
 - v. Vehicle Movement Plan (internal to construction sites);
 - vi. Pedestrian Management Plan (around construction sites); and
 - vii. Parking Management Plan (loss of parking).
- b. Principal Contractors will develop and implement a Construction Traffic Management Plan for their scope of works. The Construction Traffic Management Plan will as a minimum:
 - i. Implement the traffic and transport mitigation measures as detailed in the environmental approval documentation;
 - ii. be developed in consultation with the relevant road authority, CBD Coordinator General (CCO) and / or transport operator;
 - iii. Set out the overall traffic management resources, processes and procedures for the management of traffic and transport during construction of the Project Works and Temporary Works;

- iv. Identify types and volumes of construction vehicles and associated route and time restrictions;
 - v. Identify traffic generation from other major infrastructure developments, impacts from construction traffic and haulage routes;
 - vi. Identify potential activities that could result in the disruption to traffic and transport networks, including pedestrian, cyclist and public transport networks and during special events;
- c. The individual construction traffic plans listed in (a) are to comply with and address the requirements of RMS Traffic Control at Worksites Manual AS 1742.3 Manual of uniform traffic control devices Part 3: Traffic control for works on roads, relevant Austroads Guides and RMS Supplements to Austroads and Australian Standards;
- d. The process for the development of Traffic Management Plans (TMP) including the minimum requirements as detailed in Specification G10 and as required by the relevant road authorities.
- e. The process for the development of Traffic Staging Plans (TSP) including the minimum requirements for these TSP including road design drawings showing traffic lane configurations for traffic passing through the site during various construction stages, including details of road alignment and geometry, intersection layouts, provision for buses and cyclists, work areas and pedestrian areas, drainage, signs and pavement markings;
- f. The process for the development of Traffic Control Plans (TCP). The TCPs will set out the specific traffic and transport management arrangements to be implemented at specific locations during the construction of the Project Works and Temporary Works.
- g. The process for the development of Vehicle Movement Plan (VMP). The content of a VMP will include:
- i. A diagram showing the preferred travel paths for vehicles associated with a work site entering, leaving or crossing the through traffic stream. A VMP may be combined with or superimposed on a TCP; and
 - ii. The vehicle entry and exit points into the work area, and indicate clearly that these are the only points where interface with through traffic is permitted.
- h. The process for the development of a Pedestrian Movement Plan (PMP). The content of the PMP will include:
- i. A diagram showing the allocated travel paths for workers or pedestrians around or through a worksite. A PMP may be combined with or superimposed on a TCP; and
 - ii. A diagram showing all signs and devices used to guide the workers or pedestrians.
- i. The process for the development of a Parking Management Plan (PkMP). The PkMP will identify:
- i. Parking requirements and on and offsite parking arrangements and associated impacts;
 - ii. Remote parking arrangements and associated access between sites and public transport nodes;
 - iii. Communication and parking management measures; and
 - iv. Proposals for relocation of impacted users for any Sydney CBD kerbside use impacts during the construction period.

- j. TfNSW and its Contractors will undertake liaison with agencies and the community regarding traffic management. This may involve:
 - i. Establishment of a Traffic and Transport Liaison Group which could consist of representatives from Sydney Metro Contractors, TfNSW, CCO, WestConnex, RMS, TMC, NSW Police, relevant councils, emergency services, and bus operators. The group would review and provide feedback on:
 - ♦ Road Occupancy Licence (ROL) applications to monitor potential cumulative impacts from multiple ROLs operating concurrently in one area;
 - ♦ Be consulted on the preparation of Construction Traffic Management Plans and supporting Plans; and
 - ♦ Consultation with the CCO, RMS, TMC and others in relation to the approval of Construction Traffic Management Plans, supporting Plans, or related licences for works within and external to the CBD.

8.3 Construction Traffic Mitigation

- a. Examples of traffic mitigation measures include:
 - i. Minimising heavy vehicle movements during peak traffic times;
 - ii. Avoidance of local roads for heavy vehicle routes, where feasible;
 - iii. Providing for safe pedestrian and cyclist movements around the worksites; and
 - iv. Where feasible and reasonable, contractors will provide its workforce with satellite car parking and buses to transport them to the worksites.

9. Construction Noise and Vibration Management



Figure 6 - Hebel Wall Noise Barrier at the Cheltenham Services Facility Site

9.1 Construction Noise and Vibration Management Objectives

- a. The following noise and vibration management objectives will apply to construction:
 - i. Minimise unreasonable noise and vibration impacts on residents and businesses;
 - ii. Avoid structural damage to buildings or heritage items as a result of construction vibration;
 - iii. Undertake active community consultation; and
 - iv. Maintain positive, cooperative relationships with schools, childcare centres, local residents and building owners.

9.2 Construction Noise and Vibration Management Implementation

- a. Principal Contractors will develop and implement a Construction Noise and Vibration Management Plan for their scope of works consistent with the Interim Construction Noise Guidelines (Department of Environment and Climate Change, 2009). The Construction Noise and Vibration Management Plan will include as a minimum:
 - i. Identification of work areas, site compounds and access points;
 - ii. Identification of sensitive receivers and relevant construction noise and vibration goals;
 - iii. Be consistent with, and include the requirements of the noise and vibration mitigation measures as detailed in, the environmental approval documentation and the Sydney Metro Construction Noise and Vibration Strategy (CNVS);
 - iv. Details of construction activities and an indicative schedule for construction works, including the identification of key noise and/or vibration generating construction activities (based on representative construction scenarios) that have the potential to generate noise or vibration impacts on surrounding sensitive receivers, in particular residential areas;
 - v. Identification of feasible and reasonable procedures and mitigation measures to ensure relevant vibrations and blasting criteria are achieved, including a suitable blast program;
 - vi. Community consultation requirements and Community notification provisions specifically in relation to blasting;
 - vii. The requirements of any applicable EPL conditions;
 - viii. Additional requirements in relation to activities undertaken 24 hours of the day, 7 days per week;
 - ix. Pre-construction compliance requirements and hold points;
 - x. The responsibilities of key project personnel with respect to the implementation of the plan;
 - xi. Noise monitoring requirements;
 - xii. Compliance record generation and management; and
 - xiii. An Out of Hours Works Protocol applicable to all construction methods and sites.
- b. Detailed Construction Noise and Vibration Impact Statements will be prepared for noise-intensive construction sites and or activities, to ensure the adequacy of the noise and vibration mitigation measures. Specifically, Construction Noise and Vibration Impact Statements will be prepared for EPL variation applications and works proposed to be undertaken outside of standard construction hours.
- c. Noise and vibration monitoring would be undertaken for construction as specified in the CNVS and the EPL.
- d. The following compliance records would be kept by Principal Contractors:
 - i. Records of noise and vibration monitoring results against appropriate NMLs and vibration criteria; and
 - ii. Records of community enquiries and complaints, and the Contractor's response.

9.3 Construction Noise and Vibration Mitigation

- a. All feasible and reasonable mitigation measures would be implemented in accordance with the CNVS. Examples of noise and vibration mitigation measures include:
- i. Construction hours will be in accordance with the working hours specified in Section 5.1;
 - ii. Hoarding and enclosures will be implemented where required to minimise airborne noise impacts; and
 - iii. The layout of construction sites will aim to minimise airborne noise impacts to surrounding receivers.

10. Heritage Management



Figure 7 –White Hart Inn Excavation Site

10.1 Heritage Management Objectives

- a. The following heritage management objectives will apply to construction:
- i. Embed significant heritage values through any architectural design, education or physical interpretation;
 - ii. Minimise impacts on items or places of heritage value;
 - iii. Avoid accidental impacts on heritage items; and
 - iv. Maximise worker's awareness of indigenous and non-indigenous heritage.

10.2 Heritage Management Implementation

- a. Principal Contractors will develop and implement a Heritage Management Plan which will include as a minimum:
 - i. Evidence of consultation with Registered Aboriginal Parties and the NSW Heritage Council;
 - ii. Identify initiatives that will be implemented for the enhancement of heritage values and minimisation of heritage impacts, including procedures and processes that will be used to implement and document heritage management initiatives;
 - iii. The heritage mitigation measures as detailed in the environmental approval documentation;
 - iv. The responsibilities of key project personnel with respect to the implementation of the plan;
 - v. Procedures for interpretation of heritage values uncovered through salvage or excavation during detailed design;
 - vi. Procedures for undertaking salvage or excavation of heritage relics or sites (where relevant), consistent with and any recordings of heritage relics prior to works commencing that would affect them;
 - vii. Details for the short and / or long term management of artefacts or movable heritage;
 - viii. Details of management measures to be implemented to prevent and minimise impacts on heritage items (including further heritage investigations, archival recordings and/or measures to protect unaffected sites during construction works in the vicinity);
 - ix. Procedures for unexpected heritage finds, including procedures for dealing with human remains;
 - x. Heritage monitoring requirements; and
 - xi. Compliance record generation and management.
- b. The Contractor's regular inspections will include checking of heritage mitigation measures.
- c. Compliance records will be retained by the Contractor. These will include:
 - i. Inspections undertaken in relation to heritage management measures;
 - ii. Archival recordings undertaken of any heritage item;
 - iii. Unexpected finds and stop work orders; and
 - iv. Records of any impacts avoided or minimised through design or construction methods.

10.3 Heritage Mitigation

- a. Examples of heritage mitigation measures include:
 - i. Any heritage item not affected by the works will be retained and protected throughout construction;
 - ii. During construction undertake professional archaeological investigation, excavation, and reporting of any historical Indigenous heritage sites of state significance which will be affected. Reporting may be completed as construction progresses;
 - iii. Undertake archival recordings of all non-Indigenous heritage items affected by the works prior to commencement of works; and
 - iv. Implement unexpected heritage find procedures for Indigenous and non-Indigenous heritage items.

11. Flora and Fauna Management



Figure 8 - Demarcation of Retained Flora

11.1 Flora and Fauna Management Objectives

a. The following flora and fauna management objectives will apply to construction:

- i. Minimise impacts on flora and fauna;
- ii. Design waterway modifications and crossings to incorporate best practice principles;
- iii. Retain and enhance existing flora and fauna habitat wherever possible; and
- iv. Appropriately manage the spread of weeds and plant pathogens.

11.2 Flora and Fauna Management Implementation

- a. Principal Contractors will develop and implement a Flora and Fauna Management Plan which will include as a minimum:
 - i. The ecological mitigation measures as detailed in the environmental approval documentation;
 - ii. The responsibilities of key project personnel with respect to the implementation of the plan;
 - iii. Procedures for the clearing of vegetation and the relocation of flora and fauna;
 - iv. Details on the locations, monitoring program and use of nest boxes by fauna;
 - v. Procedures for the demarcation and protection of retained vegetation, including all vegetation outside and adjacent to the construction footprint;
 - vi. Plans for impacted and adjoining areas showing vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities have been recorded;
 - vii. Vegetation management plan(s) for sites where native vegetation is proposed to be retained;
 - viii. Identification of measures to reduce disturbance to sensitive fauna;
 - ix. Rehabilitation details, including identification of flora species and sources, and measures for the management and maintenance of rehabilitated areas (including duration of the implementation of such measures);
 - x. Weed management measures focusing on early identification of invasive weeds and effective management controls;
 - xi. A procedure for dealing with unexpected EEC threatened species identified during construction, including cessation of work and notification of the Department, determination of appropriate mitigation measures in consultation with the OEH (including relevant relocation measures) and updating of ecological monitoring or off-set requirements;
 - xii. Details on the methodology for vegetation mapping and survey;
 - xiii. Ecological monitoring requirements; and
 - xiv. Compliance record generation and management.
- b. Principal Contractors would undertake the following ecological monitoring as a minimum:
 - i. A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor's Environmental Manager (or delegate). The pre-clearing inspection will include, as a minimum:
 - ♦ Identification of hollow bearing trees or other habitat features;
 - ♦ Identification of any threatened flora and fauna;
 - ♦ A check on the physical demarcation of the limit of clearing;
 - ♦ An approved erosion and sediment control plan for the worksite; and
 - ♦ The completion of any other pre-clearing requirements required by any project approvals, permits or licences.

- ii. The completion of the pre-clearing inspection will form a HOLD POINT requiring sign-off from the Contractor's Environmental Manager (or delegate) and a qualified ecologist; and
 - iii. A post clearance report, including any relevant Geographical Information System files, will be produced that validates the type and area of vegetation cleared including confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts.
- c. The Principal Contractor's regular inspections will include a check on the ecological mitigation measures and project boundary fencing.
- d. The following compliance records would be kept by the Principal Contractor:
- i. Records of pre-clearing inspections undertaken;
 - ii. Records of the release of the pre-clearing hold point; and
 - iii. Records of ecological inspections undertaken.

11.3 Flora and Fauna Mitigation

- a. Examples of flora and fauna mitigation measures include:
- i. Areas to be retained and adjacent habitat areas will be fenced off prior to works to prevent damage or accidental over clearing;
 - ii. Clearing will follow a two-stage process as follows:
 - ♦ Non-habitat trees will be cleared first after sign-off of the pre-clearing inspection; and
 - ♦ Habitat trees will be cleared no sooner than 48 hours after non-habitat trees have been cleared. A suitably qualified ecologist will be present on site during the clearing of habitat trees. Felled habitat trees will be left on the ground for 24 hours or inspected by the ecologist prior to further processing.
 - iii. Weed management is to be undertaken in areas affected by construction prior to any clearing works in accordance with the Noxious Weeds Act 1993.

12. Visual Amenity Management

12.1 Visual Amenity Management Objectives

a. The following visual and landscape management objectives will apply to the construction of the project:

- i. Minimise impacts on existing landscape features as far as feasible and reasonable;
- ii. Ensure the successful implementation of the Landscape Design; and
- iii. Reduce visual impact of construction to surrounding community.

12.2 Visual Amenity Management Implementation

a. Principal Contractors will develop and implement a Visual Amenity Management Plan for temporary works which will include as a minimum:

- i. The visual mitigation measures as detailed in the environmental approval documentation for construction;
- ii. Input from an experienced Landscape or Urban Designer;
- iii. The maintenance of outward facing elements of site hoarding or noise barriers, including the removal of graffiti and weeds;
- iv. Apply the principles of Australian Standard 4282-1997 Control of the obtrusive effects of outdoor lighting and relevant safety design requirements and detail mitigation measures to minimise lighting impacts on sensitive receivers for all permanent, temporary and mobile light sources;
- v. Identify the processes and procedures that will be used for the incorporation of the principles of Crime Prevention Through Environmental Design (CPTED) in the design and construction of any temporary site facilities; and
- vi. Compliance record generation and management.

b. Visual and landscape measures will be incorporated into the Principal Contractor's regular inspections including checking the health of retained vegetation around site boundaries, checking the condition of any site hoarding and acoustic sheds, and checking the position and direction of any sight lighting.

c. The Contractor will retain compliance records of any inspections undertaken in relation to visual and landscape measures.

12.3 Visual Amenity Mitigation

a. Examples of visual amenity mitigation measures include:

- i. Wherever feasible and reasonable, vegetation around the perimeter of the construction sites will be maintained;
- ii. Temporary construction works will be designed with consideration of urban design and visual amenity as per Section 4.4; and
- iii. Temporary site lighting, for security purposes or night works will be installed and operated in accordance with AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting.

13. Carbon and Energy Management

13.1 Carbon and Energy Management Objectives

- a. The following carbon and energy management objectives will apply to construction:
 - i. Reduce energy use and carbon emissions during construction;
 - ii. Support innovative and cost effective approaches to energy efficiency, low carbon / renewable energy sources and energy procurement; and
 - iii. Design to reduce energy use and carbon emissions during operations.

13.2 Carbon and Energy Management Implementation

- a. Principal Contractors will develop and implement a Carbon and Energy Management Plan that will include, as a minimum:
 - i. The carbon and energy mitigation measures as detailed in the environmental approval documentation;
 - ii. The relevant requirements of the Sydney Metro Environment and Sustainability Policy and the Sydney Metro Sustainability Strategy;
 - iii. The responsibilities of key project personnel with respect to the implementation of the plan;
 - iv. The low carbon strategies and initiatives that will be implemented to minimise the carbon emissions associated with construction;
 - v. The energy efficiency strategies and initiatives that will be implemented to minimise energy use associated with construction;
 - vi. Carbon emission estimates determined using a carbon footprint assessment undertaken in accordance with ISO 14064-1, ISO14064-2 and ISO14064-3 that incorporates direct and indirect emissions associated with construction; and
 - vii. Compliance record generation and management.
- b. Reporting of carbon and energy will be undertaken throughout the construction works in accordance with the National Greenhouse and Energy Reporting Act 2007.
- c. The Contractors would be required to retain appropriate records and prepare carbon footprint assessments (inclusive of Scope 1, 2 and 3 emissions) at various stages of construction.

13.3 Carbon and Energy Mitigation

- a. Examples of carbon and energy mitigation measures include:
 - i. Equipment and material selection will have consideration of energy efficiencies;
 - ii. Construction workers will be encouraged to use sustainable transport options and green travel plans will be developed;
 - iii. Inclusion of renewable energy sources to power temporary facilities and equipment where feasible;
 - iv. Designing and operating Site offices for energy efficiency;
 - v. Offsetting a portion of construction greenhouse gas emissions; and
 - vi. Efficient operation of vehicles and equipment.

14. Materials Management



Figure 9 - Sydney Monorail Beams being re-used at the Norwest Station Site

14.1 Materials Management Objectives

a. The following materials management objectives would apply to the construction of the project:

- i. Reduce material use throughout the project life-cycle;
- ii. Consider embodied impacts in materials selection;
- iii. Use recycled materials;
- iv. Recycle and reuse materials onsite; and
- v. Influence subcontractors and materials suppliers to adopt sustainability objectives in their works and procurement.

14.2 Materials Management Implementation

- a. Principal Contractors will be required to develop and implement a Sustainable Procurement Policy that will include as a minimum:
 - i. The materials mitigation measures as detailed in the environmental approval documentation;
 - ii. The relevant requirements of the City & Southwest Environment and Sustainability Policy and the City & Southwest Sustainability Strategy;
 - iii. The responsibilities of key project personnel with respect to the implementation of the policy;
 - iv. Compliance record generation and management;
 - v. Ethical sourcing of materials; and
 - vi. Local sourcing.
- b. The Contractors will be required to retain records detailing the consideration of sustainability in the procurement of all materials.

14.3 Materials Mitigation

- a. Examples of materials mitigation measures include:
 - i. Consideration of quality and durability in the procurement of materials;
 - ii. Using recycled materials;
 - iii. Using materials with a lower embodied impact;
 - iv. Using recycled steel in concrete reinforcement;
 - v. Developing deconstruction plans to enable recycling and reuse at end-of-life;
 - vi. Using low-VOC, low emission materials;
 - vii. Using sustainably sourced timber and wood products;
 - viii. Low-carbon concrete; and
 - ix. Consideration of whole-of-life costs during procurement.

15. Soil and Water Management



Figure 10 - Erosion and Sediment Controls at the Cudgegong Rd Site

15.1 Soil and Water Management Objectives

- a. The following soil and water management objectives will apply to construction:
 - i. Minimise pollution of surface water through appropriate erosion and sediment control;
 - ii. Maintain existing water quality of surrounding surface watercourses; and
 - iii. Source construction water from non-potable sources, where feasible and reasonable.

15.2 Soil and Water Implementation

- a. Principal Contractors will develop and implement a Soil and Water Management Plan for their scope of works. The Soil and Water Management Plan will include as a minimum:
 - i. The surface water and flooding mitigation measures as detailed in the environmental approval documentation;
 - ii. Details of construction activities and their locations, which have the potential to impact on water courses, storage facilities, stormwater flows, and groundwater;
 - iii. Surface water and ground water impact assessment criteria consistent with the principles of the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines;
 - iv. Management measures to be used to minimise surface and groundwater impacts, including identification of water treatment measures and discharge points, details of how spoil and fill material required by the SSI will be sourced, handled, stockpiled, reused and managed; erosion and sediment control measures; salinity control measures and the consideration of flood events;
 - v. A contingency plan, consistent with the Acid Sulphate Soils Manual (EPA 1998), to deal with the unexpected discovery of actual or potential acid sulphate soils, including procedures for the investigation, handling, treatment and management of such soils and water seepage;
 - vi. Management measures for contaminated material (soils, water and building materials) and a contingency plan to be implemented in the case of unanticipated discovery of contaminated material, including asbestos, during construction;
 - vii. A description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be undertaken, the locations where monitoring would take place, how the results of the monitoring would be recorded and reported, and, if any exceedance of the criteria is detected how any non-compliance can be rectified;
 - viii. The requirements of any applicable EPL conditions;
 - ix. The responsibilities of key project personnel with respect to the implementation of the plan;
 - x. Procedures for the development and implementation of Progressive Erosion and Sediment Control Plans;
 - xi. Identification of locations where site specific Stormwater and Flooding Management Plans are required; and
 - xii. Compliance record generation and management.
- b. Principal Contractors will develop and implement Progressive Erosion and Sediment Control Plans (ESCPs) for all active worksites in accordance with Managing Urban Stormwater: Soils & Construction Volume 1 (Landcom, 2004) (known as the “Blue Book”). The ESCPs will be approved by the Contractor’s Environmental Manager (or delegate) prior to any works commencing (including vegetation clearing) on a particular site. Copies of the approved ESCP will be held by the relevant Contractor personnel including the Engineer and the Site Foreman.
- c. ESCPs will detail all required erosion and sediment control measures for the particular site at the particular point in time and be progressively updated to reflect the current site conditions. Any amendments to the ESCP will be approved by the Contractor’s Environmental Manager (or delegate).

- d. Principal Contractors will develop and implement Stormwater and Flooding Management Plans for the relevant construction sites. These plans will identify the appropriate design standard for flood mitigation based on the duration of construction, proposed activities and flood risks. The plan will develop procedures to ensure that threats to human safety and damage to infrastructure are not exacerbated during the construction period.
- e. Principal Contractors will undertake the following soil and water monitoring as a minimum:
 - i. Weekly inspections of the erosion and sediment control measures. Issues identified would be rectified as soon as practicable;
 - ii. Additional inspections will be undertaken following significant rainfall events (greater than 20 mm in 24 hours); and
 - iii. All water will be tested (and treated if required) prior to discharge from the site in order to determine compliance with the parameters of the EPL. No water will be discharged from the site without written approval of the Contractor's Environmental Manager (or delegate). This is to form a HOLD POINT.
- f. The following compliance records will be kept by the Principal Contractors:
 - i. Copies of current ESCPs for all active construction sites;
 - ii. Records of soil and water inspections undertaken;
 - iii. Records of testing of any water prior to discharge; and
 - iv. Records of the release of the hold point to discharge water from the construction site to the receiving environment.
- g. The following water resources management objectives will apply to the construction of the project:
 - i. Minimise demand for, and use of potable water;
 - ii. Maximise opportunities for water re-use from captured stormwater, wastewater and groundwater;
 - iii. Examples of measures to minimise potable water consumption include:
 - ♦ Water efficient controls, fixtures and fittings in temporary facilities;
 - ♦ Collecting, treating and reusing water generated in tunnelling operations, concrete batching and casting facility processes;
 - ♦ Using recycled water or treated water from onsite sources in the formulation of concrete;
 - ♦ Harvesting and reusing rainwater from roofs of temporary facilities;
 - ♦ Using water from recycled water networks;
 - ♦ Collecting, treating and reusing groundwater and stormwater;
 - ♦ Using water efficient construction methods and equipment; and
 - ♦ Providing designated sealed areas for equipment wash down.

15.3 Soil and Water Mitigation

- a. Examples of surface water and flooding mitigation measures include:
 - i. Clean water will be diverted around disturbed site areas, stockpiles and contaminated areas;
 - ii. Control measures will be installed downstream of works, stockpiles and other disturbed areas;

- iii. Exposed surfaces will be minimised, and stabilised / revegetated as soon feasible and reasonable upon completion of construction;
- iv. Dangerous good and hazardous materials storage will be within bunded areas with a capacity of 110 per cent of the maximum single stored volume; and
- v. Spill kits will be provided at the batch plants, storage areas and main work sites.

16. Air Quality



Figure 11 - Dust Mitigation at Norwest Station Site

16.1 Air Quality Management Objectives

- a. The following air quality management objectives will apply to construction:
 - i. Minimise gaseous and particulate pollutant emissions from construction activities as far as feasible and reasonable; and
 - ii. Identify and control potential dust and air pollutant sources.

16.2 Air Quality Management Implementation

- a. Principal Contractors will develop and implement an Air Quality Management Plan which will include, as a minimum:
 - i. The air quality mitigation measures as detailed in the environmental approval documentation;
 - ii. The requirements of any applicable EPL conditions;
 - iii. Site plans or maps indicating locations of sensitive receivers and key air quality / dust controls;
 - iv. The responsibilities of key project personnel with respect to the implementation of the plan;

- v. Air quality and dust monitoring requirements; and
 - vi. Compliance record generation and management.
- b. Air quality and dust monitoring will involve the following as a minimum:
- i. Meteorological conditions will be monitored and appropriate responses will be organised and undertaken periodically by the Principal Contractor;
 - ii. Regular visual monitoring of dust generation from work zones; and
 - iii. Monitoring emissions from plant and construction vehicles to ensure they have appropriate emission controls and are being maintained correctly.
- c. The following compliance records will be kept by the Principal Contractor:
- i. Records of any meteorological condition monitoring;
 - ii. Records of any management measures implemented as a result of adverse, windy weather conditions; and
 - iii. Records of air quality and dust inspections undertaken.

16.3 Air Quality Mitigation

- a. Examples of air quality mitigation measures include:
- i. Plant and equipment will be serviced and maintained in good working order to reduce unnecessary emissions from exhaust fumes;
 - ii. Water suppression will be used for active earthwork areas, stockpiles, unsurfaced haul roads and loads of soil being transported to reduce wind-blown dust emissions;
 - iii. Wheel-wash facilities or rumble grids will be provided and used near the site exit points, as appropriate; and
 - iv. Dust extraction and filtration systems will be installed for tunnel excavation works and deep excavation with limited surface exposure.

17. Waste Management & Recycling

17.1 Waste Objectives

- a. The following waste objectives will apply to construction:
 - i. Minimise waste throughout the project life-cycle; and
 - ii. Waste management strategies will be implemented in accordance with the *Waste Avoidance and Resource Recovery Act 2001* management hierarchy as follows:
 - ♦ Avoidance of unnecessary resource consumption;
 - ♦ Resource recovery (including reuse, reprocessing, recycling and energy recovery); and
 - ♦ Disposal.
- b. Targets for the recovery, recycling or reuse of construction waste, and beneficial reuse of spoil will be provided by the Principal Contractor.

17.2 Waste Implementation

- a. Principal Contractors will develop and implement a Waste Management and Recycling Plan which will include as a minimum:
 - i. The waste management and recycling mitigation measures as detailed in the environmental approval documentation;
 - ii. The responsibilities of key project personnel with respect to the implementation of the plan;
 - iii. Waste management and recycling monitoring requirements;
 - iv. A procedure for the assessment, classification, management and disposal of waste in accordance with the Waste Classification Guidelines (DECC, 2008); and
 - v. Compliance record generation and management.
- b. Principal Contractors will undertake the following waste monitoring as a minimum:
 - i. Weekly inspections will include checking on the waste storage facilities on site; and
 - ii. All waste removed from the site will be appropriately tracked from 'cradle to grave' using waste tracking dockets.
- c. Principal Contractors will report all necessary waste and purchasing information to TfNSW as required for TfNSW to fulfil their WRAPP reporting requirements.
- d. Compliance records will be retained by the Principal Contractors in relation to waste management including records of inspections and waste dockets for all waste removed from the site.

17.3 Waste Mitigation

- a. Examples of waste management and recycling mitigation measures include:
 - i. All waste materials removed from the sites will be directed to an appropriately licensed waste management facility;
 - ii. The use of raw materials (noise hoarding, site fencing, etc...) will be reused or shared, between sites and between construction contractors where feasible and reasonable; and
 - iii. Recyclable wastes, including paper at site offices, will be stored separately from other wastes.

18. Acronyms

Acronym	
CEMP	Construction Environmental Management Plan
CNVS	Construction Noise and Vibration Strategy
DP&E	Department of Planning and Environment (Formerly Department of Planning and Infrastructure)
EIS	Environmental Impact Statement
EMF	Environmental Management Framework
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EPL	Environment Protection Licence (issued by EPA under the POEO Act)
ER	Environmental Representative
ESCP	Erosion and Sediment Control Plan
NOHSC	National Occupational Health and Safety Commission
OEH	Office of Environment and Heritage (Formerly DECCW)
POEO Act	Protection of the Environment Operation Act 1997
RMS	Roads and Maritime Service (Formerly RTA)
TBM	Tunnel Boring Machine
TfNSW	Transport for NSW

Appendix A – Environment and Sustainability Policy



Transport
for NSW

Environment
& Sustainability
Policy



This Policy reflects a commitment in our delivery of the Sydney Metro program to:

- Align with, and support, Transport for NSW (TfNSW) Environment & Sustainability Policy.
- Optimise sustainability outcomes, transport service quality, and cost effectiveness.
- Develop effective and appropriate responses to the challenges of climate change, carbon management, resource and waste management, land use integration, customer and community expectation, and heritage and biodiversity conservation.
- Be environmentally responsible, by avoiding pollution, enhancing the natural environment and reducing the project ecological footprint, while complying with all applicable environmental laws, regulations and statutory obligations.
- Be socially responsible by delivering a workforce legacy which benefits individuals, communities, the project and industry, and is achieved through collaboration and partnerships.

To deliver on these commitments, the Sydney Metro team will:

Industry leadership

- Implement coordinated and transparent decision making, by engaging with stakeholders and suppliers, encouraging innovation and demonstrating sustainability leadership.
- Explore new benchmarks for the transport infrastructure sector by requiring high standards from our designers, contractors and suppliers, building on experience gained through development of Sydney Metro Northwest.

Community and customer

- Provide accessible, safe, pleasurable, and convenient access and transport service for all customers.
- Establish positive relationships with community and stakeholders to maximise opportunities to add value to local communities.

Land use integration and place making

- Create desirable places, promote liveability, cultural heritage, and optimise both community and economic benefit.
- Balance transit oriented development opportunities with stakeholder expectations.

Embedding environmental and social sustainability

- Establish robust sustainability objectives and targets.
- Maintain an environmental management system that is integrated into all our project activities.
- Ensure thorough and open environmental assessment processes are developed and maintained.
- Develop and maintain an environmental management framework to embed best practice pollution management and sustainable outcomes during construction.
- Apply effective assurance processes to monitor performance against the project environment and sustainability objectives and identify appropriate reward or corrective action, as required.
- Apply environment and sustainability specific processes to the procurement of delivery activities.

Accountability

- Undertake public sustainability reporting.
- Hold employees and contractors accountable for proactively meeting their environmental and social sustainability responsibilities.
- Provide appropriate training and resources necessary to meet our responsibilities.

Rodd Staples - Program Director, Sydney Metro

CONSTRUCTION ENVIRONMENTAL MANAGEMENT FRAMEWORK

> August 2017