Operational Environment Management Plan

Sydney Metro Northwest

Document Information

Document Number:	NWRLOTS-NRT-ADM-EN-PLN-720253	
PDCS reference:	MTS-OGN-PL-60105 //////	
Version:	2.0	
Date:	Issue Date	Next Review Date
	19/07/2021	19/07/2022
Network	Sydney Metro Northwest (SMNW)	

VERSION HISTORY

Approval Record

Function	Position	Name	Signature	Date
Prepared by	Safety Management	John Papagianis	John Papagianis (Jul 25, 2021 19:35 GMT+10)	Jul 25, 2021
Reviewed by	Environmental / Sustainability Advisor	Tajwar Dar		Jul 26, 2021
Reviewed by	GM Safety, Quality, Risk & Environment	Alan Kelly	Alan kelly (Jul 26, 2021 10:14 GMT+10)	Jul 26, 2021
Approved by	MTS CEO	Daniel Williams		Jul 26, 2021

Amendment Record

Date	Rev	Amendment description	By
14/12/2018	A	For Agency Consultation	Brett Brimfield
15/02/2019	B	Revised to address Council & Agency Consultation. For DP&E submission	Brett Brimfield
19/07/2021	2.0	Annual review and Operational Phase alignment and application of new template	John Papagianis

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1 Introduction

This Operational Environmental Management Plan (OEMP) has been prepared by Metro Trains Sydney Pty Ltd (MTS) to fulfil the requirements of the relevant planning approvals for the Operation and Maintenance (O&M) of the Sydney Metro Northwest network. MTS is a consortium comprised of MTR Corporation (UK) NRT Ltd, John Holland Sydney NRT Pty Ltd and UGL Rail Services Pty Ltd.

This Plan will be implemented and subject to the MTS process of ongoing review and continuing improvement, through the operational life of the Project (Section 9).

1.1 Purpose

This OEMP has been prepared to comply with the requirements of the conditions of approval issued for the various projects by the NSW Department of Planning and Environment (DP&E) and the relevant requirements of the NSW Government *Environmental Management System Guidelines (3rd Edition)* (August 2013).

Objects of this OEMP are to ensure:

- Environmental management requirements relevant to Operations and Maintenance are clearly identified;
- Outline systems that will be used to support environmental management;
- Operations and Maintenance objectives and targets have been clearly established;
- and
- A management and reporting structure to implement and measure the effectiveness of the mitigation measures identified for operations.

1.1.1 Relationship with other Plans

This OEMP describes the strategies and techniques that support other MTS Plans, including but not limited to the following:

- Incident Management Plan
- Risk Management Plan

1.2 Amendment and Approval

This OEMP is to be updated to comply with the requirements of Exhibit 1 – Scope and Performance Requirements, Section 5.3 Management Requirements / Project Plans in that MTS must update this OEMP in accordance with the provisions of clause 8 of the Deed, to Sydney Metro.

1.3 OEMP Review

This OEMP is to be submitted for review per Operations, Trains and Systems Exhibit 1 Scope and Performance Requirements Appendix 54 – Project Plan Requirements.

It may also be updated from time to time to take account of events or circumstances which will or may affect OTS PPP Project Activities. These include but are not limited to variations and changes in law.

Any update to this OEMP is to impose standards that are equal to, greater than or higher than those imposed by; and provide an equal or higher level of detail than previous versions.

1.4 Context

Sydney Metro Northwest is the first stage in Australia's largest public transport project, being the Sydney Metro rapid transit rail network. The Sydney Metro Northwest rapid transit rail network opened to customers on 26th May2019, with a train programmed to arrive at least every four minutes in peak periods.

The network includes:

- Eight new railway stations;
- 4,000 commuter car parking spaces; and
- The upgrade and conversion of the existing Epping to Chatswood Rail Line (ECRL) railway stations to accommodate rapid transit.

The network is being operated over a 15-year period by a Public Private Partnership (PPP) between the asset owner, Sydney Metro Authority and Metro Trains Sydney (MTS). It is the largest PPP in the history of New South Wales.

The Operation and Maintenance of the Sydney Metro Northwest includes all works associated with customer service delivery, operations, maintenance and repair of the new, and converted, rapid transit rail network.

The NSW Government has also announced the Sydney Metro City and Southwest project which will extend the rapid transit rail network from the Sydney Metro Northwest at Chatswood, under Sydney Harbour, into the CBD, and west to Bankstown. The Sydney Metro Authority has also secured a transport corridor into Marsden Park to allow for continued growth in the northwest sector into the future.

Sydney Metro Northwest is the first component of the wider Sydney Metro network, and the first part to come into operation, and is the subject of this OEMP. Figure 1 below illustrates how Sydney Metro Northwest sits within the wider rapid transit network.

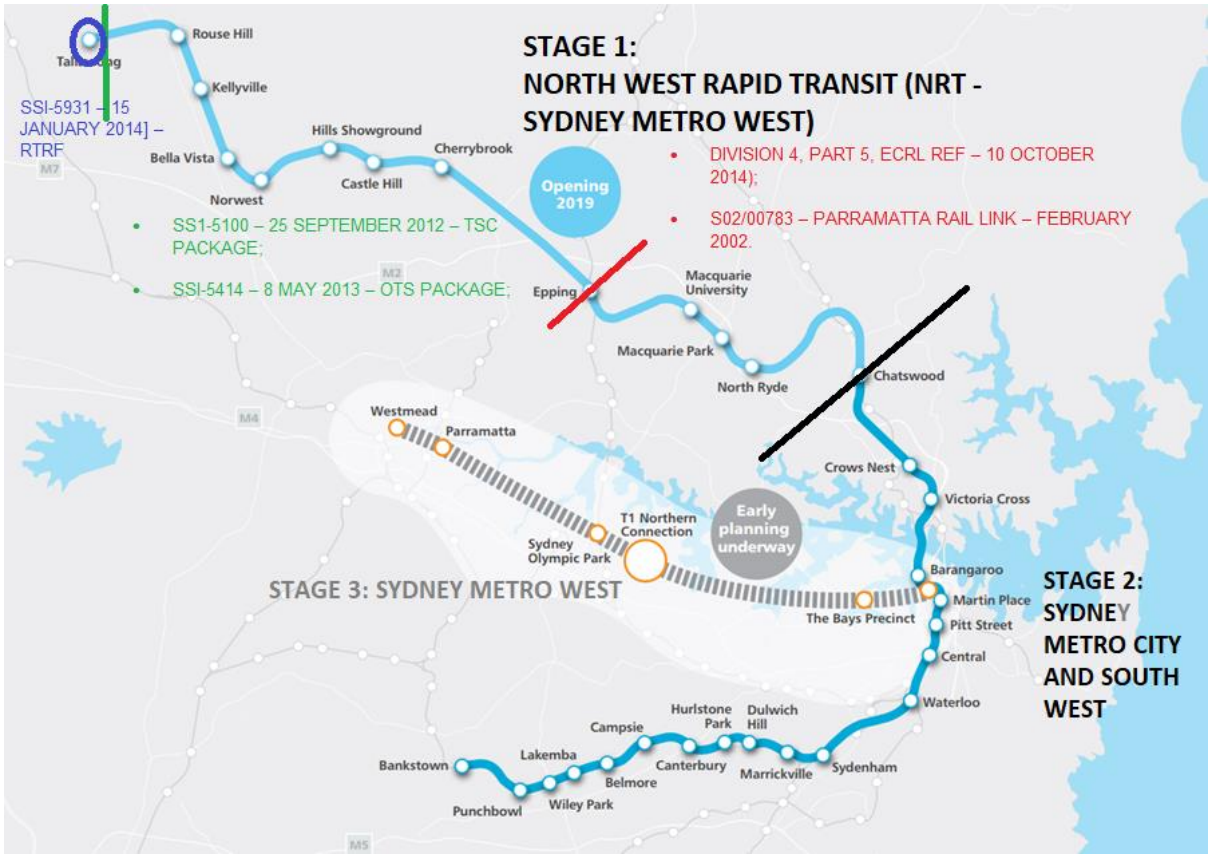

Figure 1: Sydney Metro and Sydney Metro Northwest Context

1.5 Description of Operational Activities

The activities that will be undertaken during the operation of the Sydney Metro Northwest network have been discussed in detail within the relevant Environmental Impact Statements (EIS) and Review of Environmental Factors (REF) prepared to gain planning approval for the Project.

The network will operate 24 hours a day, 7 days per week, 52 weeks in the year.

Table 1 and Table 2 below detail the anticipated frequency of each activity, and the general times of day that the operation and maintenance and repair works will be required to be undertaken.

Table 1 - Network Wide – Operational Activities & Indicative Frequencies & Hours of Work

ACTIVITY	INDICATIVE FREQUENCY	TYPICAL WORKING HOURS
Emergency Works	As occur.	Immediately after incident. All hours.

Infrastructure Maintenance	Nightly.	0100 to 0425 (in between passenger services.
Infrastructure Repair Works (planned)	3 monthly (6 monthly by section, 2x sections)	48hr shutdown Last service early Saturday morning (1am) to first service Monday
Infrastructure Repair Works (unplanned)	As required after passenger services cease.	0100 to 0400
Fire and Life Safety	Constant monitoring Address incidents as they occur	All hours. Immediately after incidents.
Safety and Security	Constant monitoring Address incidents as they occur	All hours. Immediately after incidents.
Operation of Stations	Daily	0400 to 0130 – Open to Commuters 0130 to 0400 – O&M activities are required
Operation of Trains	Daily	0425 to 0100 – Open to Commuters 0100 to 0425 – O&M activities are required

Further details of the activities to be undertaken network wide are contained within Chapter 6 of the *Environmental Impact Statement Stage 2 – Stations, Rail Infrastructure and Systems* (October 2012) and approved under SSI-5414 (May 2013).

Table 2: SMTF – Operational Activities and Indicative Frequencies and Hours of Work

ACTIVITY	INDICATIVE FREQUENCY	TYPICAL WORKING HOURS
Emergency Works	As occur.	Immediately after incident. All hours.
Maintenance of Trains	Daily.	All hours within Maintenance Building at SMTF. Generally, daytime and evening hours for significant works within the Stabling Yard
Safety Checks on Trains	Daily, multiple times per day.	Continuously, from 30 minutes prior to the departure of first train until 30 minutes after return of last train.
Stabling of Trains	Daily.	All hours, until last passenger service completes service. 0100 to 0400.
Cleaning of Trains	Soft Clean – Daily Hard Clean – Every 2/3 days	All hours including after last passenger service of the day. 0100 to 0400.
Final Train Testing and Commissioning	As required, May – November 2019 during finalisation of commissioning (prior contractual "Final Completion")	0700 to 1800 Daily.
Maintenance of SMTF Infrastructure	As required.	Generally day-time hours, unless required at other times due to rail safety reasons
Operation of Administrative Facilities (including monitoring, etc)	Daily.	All hours.
Education and Training of Staff and Workforce	As required, including train driving competency	All hours.
Parking for Workforce, Staff	Daily.	All hours.
Deliveries	Daily.	All hours.
Security	Constantly.	24 hrs a day, 7 days per week.

Further detail of the activities to be undertake at the SMTF site are contained in Chapter 7 of the *Tallawong Road, Rouse Hill Rapid Transit Rail Facility Environmental Impact Statement* (July

2013), and approved under SSI-5931 (15 January 2014) which states at Section 7.3.6 that the SMTF facility will operate 24 hours a day 7 days per week.

2 Planning and Approvals

2.1 Statutory Approvals Context

As discussed above, the Project has been approved under a series of planning approvals, under various parts of the *Environmental Planning and Assessment (EP&A) Act 1979*.

Approvals which comprise the Project include:

- SS1-5100 – Tunnel, Stations and Civil Works (approved by DP&E 25 September 2012);
- SSI-5414 – Operations, Trains, Systems (approved by DP&E 8 May 2013);
- SSI-5931 – Rapid Transit Rail Facility (approved by DP&E 15 January 2014);
- ECRL REF – Division 4, PART 5, EP&A Act (February 2015); and
- S02/00783 – Parramatta Rail Link (approved by DP&E February 2002).

A brief discussion of what each of these approvals addressed is included below.

This OEMP has been prepared in accordance with the relevant conditions of SSI-5414 and SSI-5931. The other approvals have been addressed previously, and the remaining active conditions associated with S02/00783 – Parramatta Rail Link are being addressed separately from this OEMP in consultation with the Sydney Metro Authority.

A Compliance Table contained at Appendix A details where the relevant conditions of approval have been addressed in this OEMP.

In addition to the staged approach taken to obtaining each of the planning approvals listed above, SSI-5414 and SSI-5931 (the subject of this OEMP) have been staged under the respective conditions allowing for the delivery of the infrastructure, and any associated documentation to be stages:

- SSI-5414 – has had the following two staging reports prepared for the design and construction of the network:
  - Northwest Rail Link Stage 1 Infrastructure Approval – Staging Report v1.2 (DoPI Comment Response) 20 December 2012;
  - Northwest Rail Link Stage 2 Infrastructure Approval – Staging Report Rev 1 (22 April 2014).
- SSI-5931 – has not had any staging reports prepared to date.

MTS does not propose the staging of the operation and maintenance activities covered by either approval for the Sydney Metro Northwest network, and therefore no further staging report is required.

2.1.1 Major Civil Construction Works – SSI-5100

The first Environmental Impact Statement (EIS1) assessed impacts for Major Civil Construction Works. This covered activities, including tunnelling and viaduct construction. It was approved by the Minister for Planning and Infrastructure on 25 September 2012. This Approval was modified in April 2013 to incorporate changes to the Showground Station and adjacent precinct

2.1.2 Stations Rail infrastructure and Systems – SSI-5414

The second Environmental Impact Statement (EIS2) assessed Stations, Rail Infrastructure and Systems. This covered construction and operation of the railway itself, including stations and stations precincts, rail systems and infrastructure. It was approved by the Minister for Planning and Infrastructure 8 May 2013. This Approval was modified in April 2014 to alter the approved viaduct structure with a cable stayed bridge over Windsor Road, Rouse Hill.

2.1.3 Rapid Transit Rail Facility – SSI-5931

With the announcement of Sydney Rail Futures and the future Rapid Transit Network, a Rapid Transit Rail Facility was required (now the Sydney Metro Train Facility – SMTF). The SMTF provides for a train stabling and maintenance facility, a section of track for testing, administration staff and training facilities including an Operations Control Centre. An EIS was prepared for the construction and operation of the SMTF and approval was granted by the Minister for Planning and Infrastructure on 15 January 2014.

2.1.4 Commonwealth Statutory Requirements

Due to its impact on nationally significant vegetation communities, the Project was declared a controlled action under the Environment Protection and Biodiversity Conservation Act 1999 (Cth). Approval was granted by the Australian Government Environment Minister on 11 April 2013

2.1.5 ECRL Conversion Works

To convert the existing suburban line to next-generation metro standards, major upgrades are needed, including overhauling the stations, installing 26 km of cabling, power and signalling systems and customer improvements such as platform screen doors. The Epping to Chatswood Railway Conversion to Rapid Transit Review of Environmental Factors (REF) Report and Temporary Transport Plan were completed in October 2014 and were publicly exhibited between 13 October and 17 November 2014. The determination report and conditions of approval were issued by the Northwest Rail Link – Deputy Project Director-Safety, Environment and Business Systems on 13 February 2015.

2.2 Legal and Other Requirements

A register of legal and other requirements for the Project will be contained in the Environmental Obligation Register as part of the Integrated Management System (IMS). This register will be

maintained throughout the Project and updated as required, including to accommodate such this as:

- Changes in scope of the Project (including extension of the network);
- Legislative changes; or
- As a result of management reviews or internal / external audits.

Any changes made to the Environmental Obligations register would be communicated to the wider team where necessary through awareness training and environmental alerts (Section 5.2), specific training and other methods detailed in Section 5.2 of this OEMP.

The complete list of the relevant planning approvals conditions and environmental management measures are included in the MTS Environmental Obligation Register will be stored within the Project Management System (PMS) (Section 4.1).

2.2.1 Approvals, Permits and Licensing

MTS obtained all required licences, permits and approvals as required by law, and these will be maintained throughout operation of the network. No conditions of the applicable planning approvals remove the obligation for MTS to obtain, renew or comply with such necessary licences, permits or approvals, except as provided under Section 115ZG of the EP&A Act.

The Environmental Assessment recognised that the following approvals and licences identified in the planning approval process are required for the operation of the Sydney Metro Northwest:

- Project Approval under the EP&A Act; and
- EPL under the *Protection of the Environment Operations Act 1997* (POEA Act) for Rail Systems Activities.

Approvals in place and required for the Project are identified in Table 3.

Table 3: Delivery Phase Environmental Approvals, Permits and Licenses

APPROVAL / PERMIT / LICENCE	REGULATORY AUTHORITY	RESPONSIBILITY / TIMEFRAME	STATUS
Instrument of Approval under the EP&A Act	Minister for Planning	The Sydney Metro Authority See Section 2.1 Statutory Approvals Context of this OEMP for details.	Already approved.
EPL will be required for activities listed in Schedule 1 of the POEO Act	EPA	MTS to obtain prior to commencement of Operation of Rail Systems Operations classed as a scheduled activity under the Act.	Obtained on 24th April 2019

2.2.2 Historic Consultation

Stakeholder consultation has been an integral part of the Sydney Metro Northwest since its inception. Extensive consultation undertaken over the last 17 years, with the earliest consultation undertaken by Transport for NSW (TfNSW then TIDC) with the community, local business, and industry stakeholders in 2002, and included:

- Publication of the initial Overview Report (2002);
- Consultation for the Environmental Assessment and Concept Plan (2005 – 2007);
- Publication of the Preferred Project Report (2007); and
- Supplementary Submissions Report (2008).

In 2011 the NSW State Government determined that the Project would proceed, at which point TfNSW commenced proactive consultation with relevant stakeholders. The Project was broken into three State Significant Infrastructure (SSI) project approvals, under the already approved Concept Approval, to facilitate the construction and operation of the Project, and further consultation undertaken for each, these being:

- Tunnels, Stations and Civil Works (SSI-5100);
- Stations, Rail Infrastructure and Systems (SSI-5414); and
- Rapid Transit Rail Facility Tallawong Road, Rouse Hill (SSI-5931).

Each of the SSI applications underwent extensive consultation processes, as required under the legislation. The consultation undertaken for each of these is documented in detail in the respective EIS and submissions reports for each of the SSI applications. Further consultation was undertaken through the Design and Construction (D&C) Phase for each of the construction projects.

2.2.3 OEMP Consultation

This OEMP has been prepared to meet the Minister's Conditions associated with SSI-5414 (CoA # F4) and SSI-5931 (CoA #F7), which require that an OEMP be prepared in consultation with relevant agencies as per the Guideline for the Preparation for Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources, 2004). During the preparation of this plan, consultation was undertaken with the relevant stakeholders and agencies, between 10th January and 6th February 2019. Stakeholders were provided with a copy of the OEMP for review and feedback. Table 4 below identifies the stakeholders consulted, including feedback and outcomes from the consultation process, including the MTS response to matters raised and how / where matters have been addressed. This OEMP was provided to DP&E by Sydney Metro Authority for information, in accordance with SSI-5414 (CoA F4) and SSI-5931 (CoA F7).

Table 4: Summary of OEMP Consultation

STAKEHOLDER / AGENCY	STAKEHOLDER FEEDBACK	MTS RESPONSE / ACTION TAKEN
Environment Protection Authority	It is not EPA policy to approve or endorse OEMP documents. The EPA's role is to set environmental objectives/requirements for environmental management, rather than being directly involved in the development of strategies to achieve those objectives/requirements. MTS may wish to submit the mentioned documents, or parts thereof, as supporting information for your future Environment Protection Licence (EPL) application. Information in the documents would be a relevant consideration for EPA in exercising its functions under Section 45 of the Protection of the Environment Operations Act 1997.	MTS has included relevant parts of the OEMP in the EPL application for the operation of the Sydney Metro Northwest network.
The Hills Shire Council	Council had no comments on the OEMP.	None required.
Hornsby Shire Council	· The OEMP document addresses the CoA for both SSI-5414 and SSI-5931 Rapid Transit Facility. · The OEMP addresses the technical requirements under the CoAs. · The OEMP covers the whole of the project (both SSI-5414 and SSI-5931) and the Hornsby LGA is only impacted by the development at the Cherrybrook Station site and along the rail corridor. · There are some heritage considerations along these sites and the relevant matters may have been previously addressed. · Council finds that there are no obvious strategic land use planning issues. · Table 7 MTS Hold Points for Water Discharge needs to specify the water quality standards needed for approval.	· MTS noted that there were no strategic land use planning issues raised. · All heritage aspects of operation of the network and mitigation were identified in the EIS phase. The network has been designed and constructed to meet the requirements identified in the planning approvals for heritage. Operation of the network will be within the design and construct constraints and therefore does not pose any new or additional risk to heritage. · Water quality limits required for the sign-off of the Water Discharge Hold Point are

	Recommend: ANZECC (2000) water quality. • Table 9 Ongoing monitoring of the network is proposed but little detail is provided "…surveillance and inspection of landscaped areas of…at regular intervals." But there is no definition of 'regular interval'. • The OEMP notes that noxious and environmental weeds would be controlled in accordance with the OEMP, but there is no details within the OEMP on this matter. Recommend: a detailed biosecurity monitoring and management plan be developed. • Reference is made to water quality sites being determined and agreed to with Councils. No consultation was undertaken on this matter with Hornsby Shire Council • Table 11 General Water Quality Criteria is very high, notable turbidity and TSS (50mg/L and 50 NTU respectively). Recommend: Adoption and implementation of ANZECC (2000). • Table 12 Lady Game Drive WTP Discharge Criteria nutrient limits are very high. Recommend: Adoption and implementation of ANZECC (2000). • Table 12 Lady Game Drive WTP Discharge Criteria should have a project limit for TSS from the treatment plant. Recommend: A low TSS limit is to be adopted and defined. • Presumption - MTS will utilise the appointed waste contractor of Transport NSW to service all litter collection points. • Presumption - MTS will utilise the appointed cleaning contractor of Transport NSW to service all car parks, shelters and concourses. • Presumption – Council will be on the MTS priority list to contact should any incident or event of gross pollution occur which would or potentially could	identified in the Water Discharge Procedure. • With regard to Environmental and Noxious Weed, as provided in Section 8.1.1 "Inspections [environmental] will generally be undertaken weekly and after a significant climatic event". MTS will manage relatively small landscaped areas around stations, primary plazas, carparks and detention basin, and as such don't consider weeds to present a significant risk in these newly planted areas. Therefore, the MTS Weed Management Procedure is considered adequate to manage the level of risk presented in these areas. • Construction Soil and Water Management Plan for Sydney Metro Northwest Operations, Trains and Systems PPP (NWRLOTS-NRT-PRD-PM-PLN-000852). The Water Quality Monitoring Program is currently being implemented (through to the end of construction), and the requirements of sub-section (g) will be addressed at the time of construction completion, potentially closing compliance against this entire condition subject to the recommendation of the independent expert. Should the program continue and where MTS will revise it for operational aspects, Councils will be consulted at that later time.

	exceed the Council local government boundary.	• Water quality criteria, including TSS, have been set based on the criteria within Chapter 8 of the EIS documents and the limits set for the construction phase, which are required to be more stringent than for operation. • Water quality criteria for the Lady Game Drive WTP were set in the EIS documents, and therefore must be complied with. Additionally, MTS does not propose any changes that could impact the operation of the WTP which has been operating without incident since the commencement of operation of the ECRL. • MTS sought clarification from Council as to the intent of the reference to "appointed waste contractor" and "appointed cleaning contractor". Sydney Metro Authority do not appoint contractors but provide stringent performance criteria / cleaning standards that MTS must meet in our contract with them. MTS has amended the OEMP regarding this. • MTS will notify Council of incidents within their LGA. This will be included in our PIRMP required to be prepared under the POEO Act as MTS will hold an EPL for the operation of the Sydney Metro network.
Blacktown City Council	Thanked MTS for opportunity to review the OEMP.	None required.

	Council had no comments on the OEMP.	
City of Parramatta Council	Thanked MTS for opportunity to review the OEMP. Internal stakeholders within Council had no comments or concerns relating to the OEMP.	None required.
City of Ryde Council	Council had no comments on the OEMP.	None required.
Willoughby City Council	· That MTS adhere to all the conditions and requirements detailed in the OEMP. · That during O&M there is no negative or adverse impact on environmental and social aspects discussed in the EIS and OEMP. · Maintain the Environmental and Sustainability indicators detailed in Table 6. · That the community response process, actions and timeframe detailed in Table 8. · That the mitigation strategies and procedures detailed in Table 9. · That the Incident and Emergency Response actions in place be strictly followed. · That Willoughby Council be advised immediately should any emergency or incident have the potential to impact its residents, businesses, infrastructure or other assets. · Notify Council of any upcoming or future works which may impact its residents, businesses, infrastructure, transport network or other assets. · Notify Council of any significant changes to the OEMP that the Sydney Northwest operates under.	None required.

2.2.4 Consultation Going Forward

During the operation of the new network stakeholder consultation will be undertaken as outlined in Table 5 below which identifies potential stakeholders, stakeholder involvement, reason for consultation, form of consultation, frequency of consultation and responsible entity.

Table 5: Consultation for O&M Phase

POTENTIAL STAKEHOLDER	STAKEHOLDER INVOLVEMENT	FORM OF CONSULTATION	FREQUENCY	RESPONSIBLE ENTITY
Customers (commuters)	Complaints or assistance.	In accordance with Rail Operations Manuals and the Stakeholder Community Involvement Plan.	As required.	MTS – Customer Journey Coordinators
Sensitive Receivers (neighbours)	Notification of Works. Complaints (e.g. operational noise).	Response to environmental related complaints as per OEMP.	As required.	MTS – Corporate Communications Team MTS – Environment and Sustainability Team
Urban Growth	Future development adjacent to Project lands.	Coordination meeting. Consultation regarding planning aspects.	As required.	Sydney Metro Authority
Local Council(s)	Future development adjacent to Project lands. Revision of the Water Quality Monitoring Program where not closed-out at construction completion	Coordination meeting. Consultation regarding planning aspects. Consultation regarding water quality sites	As required.	Sydney Metro Authority MTS – Environment and Sustainability Team

Property Owners / Facility Managers e.g. Mulpha	Future development adjacent to Project lands where interfacing with private developments.	Coordination meeting. Consultation regarding planning aspects.	As required.	Sydney Metro Authority
Network Augmentation Contractors	Develop interface strategies for future augmentation works (subject to Approvals)	Interface meetings.	As required, subject to approvals	Sydney Metro Authority (Northwest) Finishing and Ancillary Works Contractor (Northwest) Sydney Metro Authority (City and Southwest) Line Wide Contractor (City and Southwest) MTS / MTR – Integration and Operations Team

3 Environmental Commitments

3.1 Environment and Sustainability Policy

The principles implemented through the Sydney Metro Northwest Environment and Sustainability Policy are designed to ensure that the environmental and sustainability performance objectives and targets are met. The Policy is included in Figure 2 below. The Policy will be displayed at the site office and communicated to staff and other interested parties via inductions and ongoing awareness programs.

The Environment and Sustainability Policy reinforces the MTS commitment to developing strategies and implementing processes and procedures to ensure adaptation to climate change, resource management (including energy, water and waste, procurement, workforce

development) and environmental management is integrated seamlessly into the operation of the network, establishing MTS as an industry leader in operational sustainability performance.

The new MTS Environment and Sustainability Policy is developed with input from key internal stakeholders through integrated cross-disciplinary participation to ensure that the policy aligns with the operation and maintenance requirements and these for environmental management and sustainability.

MTS | Metro Trains Sydney

Environment & Sustainability Policy

Metro Trains Sydney (MTS) purpose is to seamlessly connect our customers through a safe and sustainable railway, with a positive and personal experience satisfying their expectations for service delivery, improved liveability and accessibility. We intend to integrate asset and people safety, governance, environmental, social and economic sustainability consideration in all we do.

Our Environment & Sustainability Objectives

To achieve the above statement, MTS is committed to:

- Minimise impact to surrounding communities
- Prevent pollution and ensure no harm to the surrounding environment
- Ensure water discharge occurs only in a controlled approved manner
- Minimise impacts to air quality
- Ensure all waste is minimised, and disposed of accordingly
- Minimise operational energy consumption and carbon emissions
- Minimise potable water consumption
- Build workforce diversity
- Prioritised local employment
- Workforce skills and generating an employment legacy for North West Sydney
- Encourage engagement of SMEs in the supply chain for operation
- Prioritisation of procurement from local businesses
- Consider climate change adaptation factors to provide a resilient network
- Deliver passenger comfort and customer focused safety, security and service
- Enhance community benefits through transport amenity and reliability, healthy living, and community safety

To provide for this policy, Metro Trains Sydney have established an Integrated Management System (IMS) in line with the requirements of the ISO 14001 standard. Metro Trains Sydney is dedicated to the continual improvement system by:

- Providing a clear focus on priorities by establishing environmental & sustainability objectives, which are reviewed periodically through the management review process
- Implementation of a good governance practices through independent audits to ensure the ongoing internal and contractor suitability and conformity of the IMS
- Attainment of the required sustainability ratings using relevant Infrastructure Sustainability Council of Australia (ISCA) sustainability rating scheme.

Our Commitments

We will make sure:

- Statutory and regulatory requirements are determined, understood and consistently met. Comply with the Project Deed requirements and continually improve our performance in environment and sustainability aspects
- Influence contractors, subcontractors and suppliers to adopt sustainable practices
- Working proactively with key Government Regulatory Agencies, Sydney Metro, TfNSW, Business, Community Stakeholders to identify sustainability issues and opportunities, including ways to deliver the next generation of rail travel to Sydney needs.

Daniel Williams
Chief Executive Officer
Metro Trains Sydney
19 April 2021

CONNECTING THE FUTURE

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3.1.1 Environmental Objectives and Targets

Targets for environmental management of the operation and maintenance of the Sydney Metro Northwest network have been developed by MTS to address the key environmental risks identified in the risk assessment undertaken during the preparation of this OEMP. Key risks identified include the following:

- Noise and vibration impacts from surface works, in particular around the STMF;
- Contamination of land and waterways due to accidental spills or fuels, oils, etc;
- Discharge of untreated waters, due to failure of water treatments plants;
- Air quality, due to dust during surface works, or failure of plant at, at SMTF;
- Excessive generation of carbon emissions; and
- Poor resource management (including water and waste).

Environmental and Sustainability Indicators that will be used to measure the performance of the network are contained in Table 6 below.

Table 6: Proposed Environmental Indicators for Operation

KEY PERFORMANCE INDICATOR	OBJECTIVE	TARGET	TIMEFRAME	ACTIONS TO BE TAKEN
Noise and Vibration (surface)	Minimise impact to adjacent community.	Zero complaints during from sensitive receivers adjacent to works areas and SMTF.	During surface works.	Implement noise and vibration mitigation measures.
Pollution Control	Manage pollution to ensure no harm to the surrounding environment.	Zero contamination of off-site land or waterways due to spills.	Always.	Ensure spill kits are located adjacent to all works locations.
Water Discharge	Ensure water discharge occurs only in a controlled manner.	Zero uncontrolled discharges from site.	Always.	Implement discharge procedure and training.
Air Quality	Minimise impacts to air quality around Project alignment.	Zero complaints from sensitive receivers adjacent to works areas and SMTF.	During Surface works and operation of the SMTF.	Check weather conditions prior to dust generating works (e.g. tamping). Undertake regular maintenance checks of plant and equipment.

Waste	Ensure all waste is minimised, and disposed of accordingly.	All waste is to be disposed of as per its waste classification (e.g. at licenced recycling or waste facilities). 80% of operational waste to be recycled or beneficially reused.	Always.	Implementation of Waste Management Processes through the OEMP and IMS, including waste dockets for tracking and separate bins will be provided for office waste including, putrescible, co-mingled recyclables, food (compostable) waste, as well as printer cartridges, batteries, etc. All waste and cleaning contractors engaged by MTS will have to comply with the requirements of this OEMP and performance requirements of Sydney Metro Authority.
Water Consumption	Minimise potable water consumption.	Meet potable and non-potable water targets (21% potable; 79% non-potable). 100% non-potable water to be sourced from non-potable sources at sites with access to recycled water mains; and 60% for sites without access to recycled water mains. Reuse 80-85% of train wash water at the SMTF site.	Always.	Track total water consumption through onsite metering; and service bill (through procurement team). Water tracking will identify split in consumption between potable and non-potable sources.

Energy	Minimise operational energy consumption and carbon emissions.	Minimum Low voltage energy demand sourced: · 5.1% for station buildings, from sources located at stations, precincts and/ or the SMTF. · 10% for the SMTF, from on-site sources. · 10.2% for precincts from sources located at stations, precincts and/ or the SMTF.	Always.	A solar panel installation has been constructed at the SMTF to meet these targets. MTS will monitor energy generated at the solar installation and compare to the total energy consumed by the operation against the targets. MTS will identify changes in consumption patterns and investigate reasonable and feasible options for management as required.
Climate Change	Manage climate change adaptation factors to manage changes around the network.	Review the climate change projections annually (or as they become available). Update climate change risk assessment as required.	Annually.	Review up to date climate projection data and update risk assessment as required. Determine reasonable and feasible solutions to respond to identified changes to risk profile.

4 Implementation and Operation

4.1 Integrated Management System Overview

MTS will utilise an IMS developed to meet the needs of the O&M of the Sydney Metro Northwest network. The Operational Phase Environmental & Sustainability Plan (OPESP) and this OEMP forms part of that IMS and provides an overview of the system to manage and control the environmental aspects of the network during operation. It also provides the overall framework for the systems and procedures to ensure environmental impacts are minimised and legislative and other requirements fulfilled. The OEMP establishes the system for implementation, monitoring and continuous improvement to minimise impacts from the operation and maintenance of the network on the environment. The MTS IMS:

- Complies with the Environmental Documents; and
- Complies with the NSW Government – Environmental Management System Guidelines, Third Edition August 2013.

The IMS consists of the following key components:

- **Governance documentation**: The Environmental and Sustainability Policy and OEMP explains the principles we will apply in operating the Project to achieve our environmental and sustainability performance objectives and targets. (Section 3).

- **OEMP and sub-plans**: This OEMP describes how MTS will achieve the environmental outcomes on the Project. Sub-plans (required by the deed) identify requirements and processes applicable to specific impacts of the Project's activities. (This OEMP and associated sub-plans.)
- **Procedures and tools**: Procedures and tools provide additional detail to support the OEMP and sub-plans or are used in the implementation of the OEMP. (Section 4.2)
- **Continuous improvement**: Continual improvement is achieved through constant measures and evaluation (including monitoring, inspections), audit and review of the effectiveness of the OEMP and adjustment and improvement of the OEMP, Project environmental outcomes and the IMS. (Figure 2 and Section 9).
- **Performance targets**: Objectives and targets have been developed as a means of assessing environmental performance during construction of the Project. (Section 3 and Section 6).
- **Integration with other management plans**: The OEMP is a functional plan in the integrated set of Project management plans. (Figure 3).

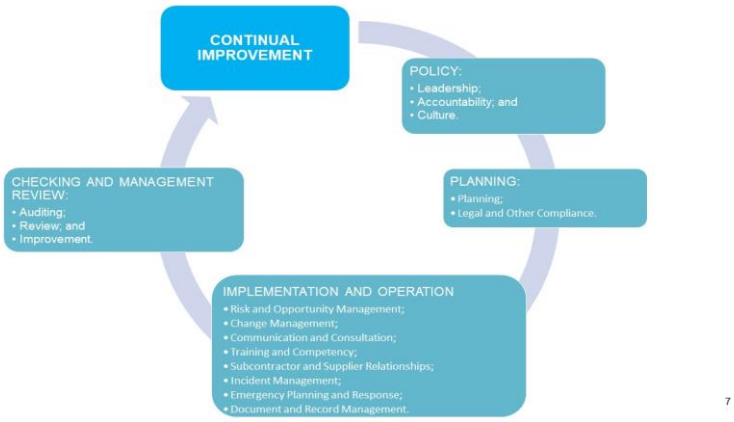

Figure 2: Continual Improvement

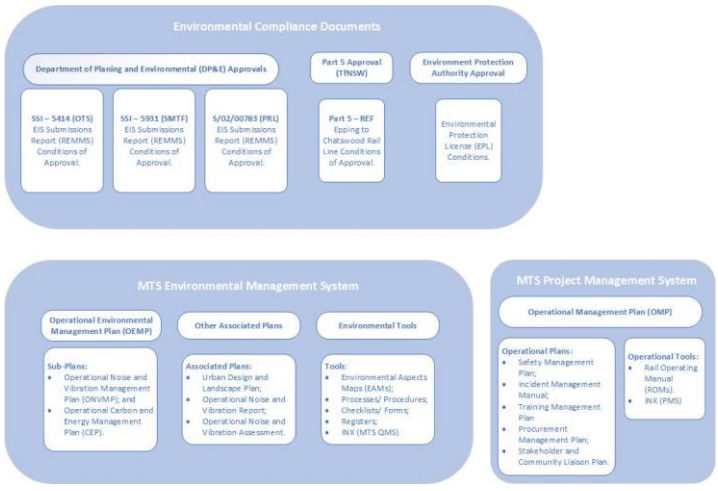

Figure 3: Integrated Management System & Environmental Management Documentation

4.1.1 Operational Environmental Management Plan

This OEMP outlines the environmental management practices and procedures that are to be followed during the operation and maintenance of the new rapid transit network. It provides the overall framework for the system and procedures to ensure environmental impacts are minimised and legislative and other requirements are fulfilled. The implementation of this OEMP is supported by the remainder of the environmental management system, which sits within a project wide Project Management System (PMS).

The environmental management measures defined in this OEMP have been developed with consideration of the CoA and Revised Environmental Mitigation Measures (REMMs) presented in each of the relevant planning approvals for the Project.

This OEMP has also been prepared to be consistent with *Guideline for the Preparation of Environmental Management Plans* (DIPNR, 2004).

4.1.2 Environmental Aspects Maps

An Environmental Aspect Map (EAM) is a document prepared to assist in the planning and management of specific areas. Environmental and socially sensitive areas including vegetation, heritage, sensitive receivers, waterways, etc, may be included on an EAM.

A series of EAMs spanning the Project area will supplement this OEMP and Rail Operating Manuals (ROMs). The EAM provides a simple but effective tool to identify key risk areas that in close proximity to maintenance and repair works, and to promote ongoing communication to O&M personnel throughout the operational life of the network. The EAMs would be document controlled separately to this OEMP through the MTS Integrated Management System (IMS).

4.1.3 Rail Operating Manuals

MTS will utilise Rail Operating Manuals (ROMs) as a means of managing the risks associated with the O&M activities of the Sydney Metro Northwest network. The ROMs will include a section addressing the relevant environmental risks associated with the activity(ies) being undertaken and will identify where those works are proposed to occur within or near environmentally sensitive areas. This section will include protection measures that minimise the risk of impacting the sensitive areas. The requirement for environmental measures to be included in ROMs would be determined by the Environment and Sustainability Advisor for those activities deemed to carry a risk to the environment (e.g. works near waterways).

As a minimum, the environmental management section of each ROM will include:

- Description of the work activity, including any plant and equipment to be used;
- Outline of the sequence of tasks for the activity, including interfaces with other construction activities;
- Identification of any environmental and/or socially sensitive areas, sites or places;
- Identification of potential environmental risks/impacts due to the work activity;
- Mitigation measures to reduce the identified environmental risk, including assigned responsibilities to site management personnel;

- Hold-points requiring sign-off by the Environment and Sustainability Advisor (if required);
- Process for assessing the performance of the implemented mitigation measures.

For new or changed activities a Works Approval Form (Section 4.1.3) will be completed and provided to the Environment and Sustainability Advisor, who will undertake a risk assessment of the works. Any new or changed environmental management conditions identified during the review will be incorporated into the ROMs as required.

4.1.4 Works Approval Protocol

MTS will implement a Works Approval Protocol, attached at Appendix D to this OEMP. This Protocol has been prepared to support the OEMP for maintenance and repair activities required to undertaken on the Sydney Metro Northwest network.

While the majority of operation and maintenance works are likely to have minimal or no impact to the environment or greater community, there may be some works, in particular undertaken during the biannual possessions, that present risks to the environment and community, especially in areas where the network is at grade or on the elevated Sky-Train viaduct.

The Protocol has been developed to assess and manage works that have the potential to cause material environmental harm and or non-compliance with planning approvals and licences. Environmental Harm is defined as:

"*A pollution event required to be notified if there is a risk of 'material harm to the environment' which includes actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, and actual or potential loss or property damage exceeding $10,000.*"

The Works Approval Protocol will be implemented when proposed O&M works:

- Are occurring as part of the annual possession program;
- Are occurring for the first time, in a new area; and
- Are scheduled to occur between:
    - 2200 and 0700 – Sunday to Thursday; and / or
    - 2200 and 0800 – Friday to Sunday and Public Holidays;
- Involve ground disturbance;
- Require water quality management (e.g. treatment or discharge);
- Are likely to generate a new or significant (type or volume) waste stream (e.g. proposed use of a new chemical).

4.1.5 System Procedures, Forms and Other Documentation

The Project environmental management system procedures, forms and other documents provide instructions and records related to both environmental and non-environmental activities throughout the Project.

4.1.5.1 Integrated Management System (IMS)

MTS will establish an integrated Project Management System (PMS) which will act as a "one-stop-shop" for monitoring, reporting and managing all aspects of the operational network. Within this PMS will sit the Integrated Management System (IMS), which will store and maintain all the relevant environment and sustainability documentation required. The IMS will:

- Store, review and continual improvement of all environmental management plans, maps, processes and procedures;
- Facilitate reporting, including monthly, quarterly, annual, etc;
- Act as a repository of inspection reports, checklists, and monitoring results;
- Capture all incidents, and allow for allocation of remedial actions, and tracking of actions and close out.

4.1.6 MTS Hold Points

A "Hold Point" is a point beyond which a work process must not proceed without express written authorisation from the Environment and Sustainability Advisor.

MTS management systems and processes establish internal hold points for key activities that require environmental management measures to be in place. These hold points are identified in Table 7.

MTS will embed these hold-points in the ROMs, ensuring that any activity that requires sign-off by the Environment and Sustainability Advisor is picked up and addressed prior to the commencement of the respective activity.

Table 7: MTS Hold Points

HOLD POINT	ACTION / PERMIT REQUIRED	DOCUMENT REFERENCE
New Maintenance or Repair Work	Prior to commencement of a new activity, not previously undertaken in a particular area need Environment and Sustainability Advisor approval.	Form included in Works Approval Protocol.
Water Discharge	Prior to discharge require Environment and Sustainability Advisor approval.	Discharge Permit.
New Waste Stream (or new receiving location)	When a new waste stream is identified, or a change in the existing waste receivers is proposed require Environment and Sustainability Advisor approval.	Waste Management Process.

4.1.7 Subcontractor Management

All subcontractors are required to work in accordance with the approved OEMP, as the key management document for all Environmental and Sustainability aspects.

All subcontractors are required to attend MTS Inductions (refer to Section 5.2) where the requirements and obligations of the OEMP are communicated. A record of all subcontractors inducted would be maintained as part of the MTS Induction and Training Register(s).

Sub-contractors and their works would be regularly inspected and observed for environmental and sustainability performance, as part of an integrated O&M Phase approach involving regular inspections, monitoring and auditing described in Section 8.

4.2 Community Response

Table 8 below details the process that MTS will implement to respond to community inquiries and complaints received during the operation and maintenance of the new network relating to environmental aspects, including such things as:

- Noise and vibration;
- Water quality;
- Water management (e.g. flooding); and
- Air quality (dust).

This Environmental Complaint Response Process will be integrated into the MTS Stakeholder Community Involvement Plan (SCIP).

Table 8: Environmental Complaint Response Process

An ENVIRONMENTAL ENQUIRY OR COMPLAINT is received via Customer Information Service 131 500 and online services at www.transportnsw.info			
STEP	**ACTION**	**TIMEFRAME**	
		OPERATIONAL HOURS	**ENGINEERING HOURS**
1	INITIAL CONTACT TfNSW notifies MTS of enquiry or complaint (operational hours). MTS receive complaint where 131500 is diverted (engineering hours) Sydney Metro related web enquiry / complaint received by MTS via CRM System	Immediately. 131500 phone calls entered into CRM System and responsibility assigned to MTS Web-based enquiry / complaint entered into CRM System and responsibility assigned to MTS	Immediately. 131500 passed-off to MTS designated number 12midnight-6am Web-based form entries provided to MTS next business day by TfNSW
2	INVESTIGATION For complaints, MTS Duty Manager investigates and	Within 24 Hours, when only trains are operating	Within 2 Hours or as agreed with complainant, when maintenance and repair

	contacts complainant to seek any additional information		works are occurring in EPL Licenced Premise Within 24 Hours, when only trains are operating or not within EPL Licenced Premise
3	ESCALATION (Beyond a usual operational issue) Where it can not be resolved by Duty Manager, referred to Corporate Relations Manager for dissemination, coordination of SME or Sydney Metro / TfNSW involvement (as required) and response	Within 2 business days	
4	REVIEW SME involvement, review of complaint, investigate work practices and mitigations. Develop response including proposed monitoring and any proposed additional mitigation measures.	Within 5 business days	
5	RESOLVE Corporate Relations Manager communicates the resolution with complainant.	Target 5 business days. Where a complaint requires a detailed investigation, may require significant mitigation and may take longer than 20 days, the complainant will be kept informed of progress on a regular basis until the matter is resolved	

Note 1: Significant mitigation is defined by MTS to be mitigation that:

a. Has a cost of more than $10,000; or

b. Will require further noise modelling to determine the scope of reasonable and feasible mitigation measures (e.g. height and size of noise barriers, or specifications for at property treatments).

5 Environmental aspects, Management & Monitoring

5.1 Environmental Aspects and Impacts

Environmental aspects and impacts have been identified through review of the EIS, environmental reports, contractual documents, consultation with Sydney Metro Authority and the D&C Contractor and MTS experience.

The environmental risk assessment, included in Appendix C, details the environmental aspects identified for the operation and maintenance of the network, reference to the appropriate document detailing proposed management measures and resulting risk category after appropriate management strategies are considered. A summary of key environmental risks for the O&M Phase of the Project is provided in Section 4.3.

MTS will apply a risk management approach throughout the operational life of the Sydney Metro Northwest network to identify, assess, control and review environmental risks and harness opportunities.

The objectives of risk assessment are to:

- Identify activities/aspects, events or outcomes that have the potential to adversely affect the local environment and/or human health/property;
- Qualitatively evaluate and categorise each risk item;
- Assess whether risk issues can be managed by environmental protection measures;
- Qualitatively evaluate residual risk with implementation of measures.

Risk assessments for the Project consider AS/NZS ISO 31000:2009: Risk management – Principles and guidelines.

Environmental risks and opportunities will be integrated into the day to day functions and activities of MTS, through the implementation of Rail Operating Manuals (ROMs). ROMs will be utilised by MTS to manage all of the repair, maintenance and operation activities to be undertake during the O&M Phase of the Project. They include details of the processes, procedures and hold points that apply to each activity.

The ROMs will include a section on the relevant environment and sustainability requirements for each activity, effectively building Environmental Work Method Statements (EWMS) and other environmental controls into the project-wide system, creating a one-stop-shop for activities. This approach will ensure that environment and sustainability is fully integrated into the O&M Phase as business as usual.

Environmental risks, controls and responsibilities would be communicated through the preparation and implementation of ROMs and awareness training.

The Environment and Sustainability Advisor (or delegate) will be involved in, and will hold approval authority, for most risk assessment types listed in Section 4.3 to ensure environmental

risks and opportunities are adequately raised and addressed. Section 4.3 of this OEMP contains a brief discussion on each of the environmental risks associated with the operation and maintenance of the network. It also lists all the relevant management plans, processes and procedures that will be implemented by MTS to mitigate each of the identified environmental aspects.

Table 9 below contains a brief description of each of the environmental aspects that will need to be managed through the operational life of the network, including how each of these will be managed. Note all the plans, processes and procedures discussed below will be maintained separate from this OEMP through the MTS IMS, which will be subject to the ongoing and continual improvement processes for the whole of MTS, the environmental component of which is discussed below in Section 9 of this Plan.

Table 9: Environmental Management and Monitoring

ENVIRONMENTAL ASPECT	DESCRIPTION OF POTENTIAL RISKS / IMPACTS	MITIGATION	IMPLEMENTATION STRATGEY / PLAN / PROCESS / PROCEDURE
Surface Water, Groundwater and Discharge	Potential impacts include: • Surface water quality impacted by runoff from the Project alignment, and SMTF site; • Discharge of untreated water from site to surrounding waterways; • Uncontrolled discharge of water from site. • Failure of water Project water treatment plants leading to discharge of untreated water. • Flooding due to significant rainfall (over the 100yr PMF).	Environment and Sustainability Advisor will undertake visual surveillance of basins and drainage lines downstream of the alignment; and In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o Groundwater quality would be subject to testing, and where required treatment prior to discharge (SSI-5414 REMM Op SG3 & SSI-5414 REMM Op SW3). o Captured groundwater is to be treated at the existing WTP at Lady Game Drive, Lindfield. (SSI-5414 REMM Op SG4). o All feasible and reasonable opportunities would be identified for the reuse of captured surface water and groundwater (SSI-5414 REMM Op SG5 and SSI-5414 REMM Op SW2). o A spill management procedure will be implemented (SSI-5414 REMM Op SW1). o Treatment measures would be applied to water collected on-site (SSI-5414 REMM Op SW4 & SSI-5931 REMM Op SW4).	• OEMP Section 5 Monitoring; • Environmental Aspects Maps. • Environment Protection Licence; • Trade Waste Licence; • Works Approval Protocol; • Incident Management Framework; and • Discharge Procedure.

		○ A surface water quality monitoring program would be developed post construction for the station precincts, services facilities and the stabling depot (SSI-5414 REMM Op SW16).	
Traffic and Transport	Potential impacts include: ▪ Reduced local parking due to workforce and personnel parking on local streets during maintenance and possession works; ▪ Nuisance caused by workforce and personnel parking adjacent residents and businesses during maintenance and possession works; ▪ Increased local traffic due to increased workforce and personnel travelling to / from work around SMTF.	Safe commuter facilities for active transport (e.g. cycling and walking). Undertaking of significant maintenance and repair works during night and weekend possessions and overnight between passenger services, so as to reduce impact on available commuter parking. In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: ○ Advisory and way finding signage would be used to provide multi modal guidance to, from and within the station precincts (SSI-5414 REMM Op T1). ○ Maximising pedestrian accessibility to the stations (SSI-5414 REMM Op T2). ○ Provision of cycle storage facilities at stations (SSI-5414 REMM Op T3). ○ Provision of commuter car parking at selected stations (SSI-5414 REMM Op T4). ○ Consideration of peak period movements in assigning shift hours and changeover	▪ Green Travel Plan; ▪ Provision of adequate parking at SMTF (office and maintenance sites); ▪ Provision of significant parking facilities at stations; ▪ Sustainability messaging.

		patterns for maintenance staff at the RTRF(SSI-5931 REMM – Op T6). o Preparation of workplace travel plans for RTRF entities that would provide alternative modes for journeys to/from work (SSI-5931 REMM – Op T7).	
Noise and Vibration	Potential impacts include: · Ground borne (regenerated) noise from operation of trains within the tunnels; · Airborne noise from train operating along viaduct and at-grade areas of track; · Airborne noise around Station Precincts, due to fixed facilities, include carparks, substations, and public announcement system (PAS). · Noise and vibration from maintenance and repair works undertaken overnight (between passenger services) and during night and weekend possessions.	Identify actual noise and vibration levels (in accordance with CoA); Adjust management measures identified in ONVR in accordance with the findings of the operational assessment where required; Undertake monitoring in response to receiver complaints where considered necessary by Environment and Sustainability Advisor; Environment and Sustainability Advisor will attend possession works to undertake general surveillance of works and may undertake spot checks of noise and vibration levels to better understand the acoustic profile of the works. Ensure that when rail components (e.g. rail dampeners) are replaced during maintenance they are replaced with components with the same or improved acoustic properties; · In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o Resilient rail fasteners provided on the viaduct and rail bridges (SSI-5414 REMM Op	· OEMP Section 5 Monitoring; · Appendix E Noise and Vibration Assessment Criteria and Assumptions; · Environmental Aspects Maps; · Operational Noise and Vibration Compliance Assessment; and · Noise and Vibration Monitoring Procedure.

	▪ Airborne noise from the O&M activities at the SMTF site.	NV4 & SSI-5414 REMM Op NV6 & SSI-5414 REMM Op NV7 & SSI-5414 REMM Op NV8 & SSI-5414 REMM Op NV9 & SSI-5414 REMM Op NV10 & SSI-5414 REMM Op NV11 & SSI-5931 REMM – Op NV8 & SSI-5931 REMM – Op NV9 & SSI-5931 REMM – Op NV10). o Managing train speeds between Kellyville Station and Rouse Hill Station. o Standard, high and very high track attenuation provided through the tunnel. o The design of the sheds and equipment for the train wash and wheel lathe facilities would include noise mitigation. o Investigate the option to incorporate silencers in the compressed air lines of the rolling stock. o Investigate methods to minimise rolling stock auxiliary noise levels during procurement. o Noise sources at stations such as PA systems, air conditioners, substations and mechanical plant would be designed to meet the INP noise criteria. *NOTE: Appendix E to this OEMP contains a detailed list of the all the permanent noise and vibration mitigation measures recommended in the ONVR documents, and which have been designed and constructed by the D&C contractor.*	

Visual Amenity and Landscaping	Potential impacts include: • Light intrusion from permanent facilities at SMTF and stations; • Light intrusion from temporary works (maintenance and repair); • Poor maintenance of landscaping within Licenced Maintenance Areas (LMA) and Additional Maintained Areas (AMA); • Poor maintenance of urban design elements within LMAs, including station finishes, graffiti, etc.	Ensure that lighting installed during the D&C Phase maintains its orientation to ensure it is directed away from sensitive receivers; Undertake regular inspections of the public areas, rail corridor for cleanliness, condition and graffiti to identify where remedial actions are required; and In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o The design and ongoing maintenance of the project would adopt Crime Prevention through Environmental Design (CPTED) principles (SSI-5414 REMM V10). o Cut–off and directed lighting would be used to ensure glare and light spill on surrounding existing and future residents are minimised (SSI-5931 REMM – Op V2).	• Urban Design and Landscape Plan; • Inspections regarding the public area and rail corridor cleanliness, condition and graffiti, under the Asset Information System and Station Operations Manual (ROM).
Ecology	Potential impacts include: • Fauna strike by trains and maintenance / repair vehicles; • Weed proliferation by repair and maintenance vehicles; • Poor vegetation management of	Surveillance and inspections of all landscaped areas of the LMAs and ballasted at-grade track areas at regular intervals to ensure weeds are identified managed / removed in an appropriate manner; Include regular watering and vegetation management to ensure vegetated areas within LMAs and the SMTF are maintained; and	• OEMP Section 8 Inspections, Audits and Reporting; • Environmental Aspects Maps; • Fauna Handling Procedure; • Rail Operating Manuals.

	landscaped areas (within LMAs).	In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o Noxious and environmental weeds would be controlled within the operational site boundary (SSI-5414 REMM Op E2). o Best Practice Guidelines – Green and golden Bell Frog Habitat (DECC, 2008) would be followed during operation (SSI-5414 REMM Op E4).	
Heritage	Potential impacts include: · Damage to previously unknown heritage items during intrusive maintenance works. · Poor maintenance of vegetative screening planted by the Project to protect the significance of adjacent heritage items (e.g. Mungerie House).	Implement an Unexpected Finds Procedure to ensure that any O&M Activities that involve ground disturbance are undertaken in a manner that will reduce the risk of damage to unknown heritage; Maintain the screening established within LMAs to preserve the heritage significance of Mungerie House. In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o Maintain the vegetation retained, reinstated and planted during the construction phase including any permanent public interpretation within new railway stations (SSI-5414 REMM EH1 & SSI-5414 REMM IH1).	· OEMP Section 8 Inspections, Audits and Reporting; · Environmental Aspects Maps; · Unexpected Heritage Finds Procedure; · Inspections of landscape areas under the Asset Information System and Station Operations Manual (ROM).
Soil and Contamination	Potential impacts include:	Ensure all sites identified and remediated / managed during the D&C Phase (as per	· OEMP Section 8 Inspections, Audits and Reporting;

	• Spills of contaminated and / or hazardous materials (e.g. fuel; oil). • Importation of contaminated materials to site.	Contamination Environmental Management Plans), and any sites containing a residual risk, are identified and captured in the Environmental Aspect Maps; Identify any known contaminated sites near to the Project alignment (but not within the Project footprint) are identified in the Environmental Aspect Maps; Implement an Unexpected finds Procedure, to ensure that of contamination (solid or liquid) is discovered during the O&M Phase it is managed appropriately; and In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o Spill management procedure will be implemented (SSI-5414 REMM OpSG2 & SSI-5931 REMM – Op SG2).	• Environmental Aspects Maps; • Info Docs, including; Contamination Reports from D&C Phase, including clearance certificates. • Spill Management Procedure; and • Unexpected Contamination Finds Procedure.
Air Quality	Potential impacts include: • Dust from maintenance works at SMTF and other ballasted areas (e.g. tamping/ regulating). • Emission of fumes from maintenance facility (e.g. from dedicated areas for painting, degreasing, cutting, grinding, welding).	Visual surveillance of areas where surface works (viaduct and at-grade areas) are being undertaken for O&M activities, in particular at times of hot weather / high winds; Ensure that streetsweepers, water sprayers, and other dust suppression equipment is available to address any dust emissions in ballasted areas during significant repair and maintenance activities;	• OEMP Section 8 Inspections, Audits and Reporting; • Operational Maintenance Plan; • Plant Maintenance Schedule; • Rail Operating Manuals.

		Ensure that all painting, degreasing, cutting, grinding, welding are undertaken within a dedicated area of the maintenance building at the SMTF; and In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o Develop an OEMP including Air Quality section (SSI-5414 REMM Op A1 & SSI-5931 REMM Op A1). o Dedicated painting, degreasing, cutting, grinding, welding and similar such areas to be fitted with effective fume extraction systems (SSI-5931 REMM Op A3). o Where possible, activities where large quantities of solvents or air pollutants may be released near the site boundary and upwind of a receptor should be avoided or postponed to a more suitable period of weather (SSI-5931 REMM Op A3).	
Waste and Resource Management	Potential impacts include: Contamination of land due to improper disposal of waste; Excessive volumes of waste going to landfill; · Waste streams not properly separated causing improper disposal of waste offsite.	Provision of individual recycling bins for different waste streams, adjacent to general waste bins where required in offices and maintenance building(s); Separation of waste streams for maintenance and repair work wastes; Specialist wastes must be recycled where practicable;	OEMP Section 8 Inspections, Audits and Reporting; Waste Management Procedure; Waste Dockets; · Rail Operating Manuals (Hazardous Goods).

		Separation, categorisation of hazardous and contaminated materials from general solid waste, for disposal at appropriately licenced facilities; All waste contractors engaged by MTS will have to comply with this OEMP and other contractual arrangements, ensuring that the stringent performance criteria / cleaning standards required by Sydney Metro Authority are met; Use of waste dockets as a means of tracking waste from O&M activities, to ensure appropriate disposal; and In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o Develop an OEMP including a section on Operational Waste and Resource Recovery Management (SSI-5414 REMM Op W1 & SSI-5931 REMM – Op W1). o All dangerous good stored at the site would be below the screening thresholds set out in Applying SEPP 33 for potentially hazardous development (SSI-5931 REMM – Op DG1).	
Water Consumption	· Inadequate water reuse and recycling; · Excessive use of potable water.	Total water consumption will be tracked through: o Onsite metering; o Sydney water metering (potable and recycled water sources); o Bills from the procurement teams.	· OEMP Section 5 Monitoring; · OEMP Section 8 Inspections, Audits and Reporting; and · Sustainability Ratings (ISCA, Green Building, TfNSW

		Water tracking will identify potable and non-potable use and demand. The Environment and Sustainability Advisor will work with the Procurement team to manage monitoring of water consumption. Recycled water sources are available in the following stations and facilities and will supply 100% of the non-potable water uses at these locations: o Kellyville; o Rouse Hill; o Tallawong; o SMTF; and o Rouse Hill Bus Layover North and South. During D&C phase a network of irrigation and water source points (taps) to supply all non-potable water in these areas. MTS will ensure that all potable water will be taken from the recycled water network. Monitoring (as detailed above) will be undertaken of water use in these areas to ensure no water is sourced from potable sources. For the remainder of the network non-potable water, at locations without recycled water networks, will be sourced by the means outlined below, accounting for 60% of the non-potable water use in these locations. Rainwater Harvesting at:	Sustainable Design Guidelines.

		▪ Cherrybrook; ▪ Castle Hill; ▪ Showground; ▪ Norwest; ▪ Bella Vista; ▪ Kellyville; ▪ Rouse Hill; ▪ Tallawong; ▪ SMTF; and Monitoring (as detailed above) will be undertaken of water use in these areas to ensure no water is sourced from potable sources. This target and mechanisms for ensure it is met are included in a water tracking spreadsheet maintained by the Environment and Sustainability Advisor.	
GHG, Climate Change and Energy Use	Potential impacts include: · Excessive use of non-renewable energy sources, causing an increased carbon footprint;	A solar panel installation has been constructed on the roof of the Maintenance Building of the SMTF site. MTS will monitor the energy generated at the solar installation and compare to the total energy consumed by the operation of the Project to ensure that this target is met.	· OEMP Section 5 Monitoring; · OEMP Section 8 Reporting; and · Sustainability Ratings (ISCA IS Ratings and GBCA Green Star Ratings in Operations).

		Data will be captured by the Maintenance Building and analysed by the Environment and Sustainability Advisor monthly, reported quarterly. The Environment and Sustainability Advisor will identify changes in consumption patterns and discuss options for management (including potential augmentation) will Sydney Metro Authority as required. The OEMP at Section 5.4 outlines the management of energy consumption, including auditing and review. In addition to the above, MTS will comply with the REMMs listed below, as addressed in Appendix A to this OEMP: o Minimise GHG emissions through energy reduction and avoidance, energy efficiency and onsite and offsite renewable or low carbon energy (SSI-5414 REMM Op GHG1). o Source at least 5% of the annual operational energy demand at the station buildings from onsite renewable or low carbon sources (SSI-5414 REMM Op GHG4). o Source at least 10% of the annual operational energy demand at the Tallawong Stabling Facility (SSI-5414 REMM Op GHG5). o GHG emissions arising from use of refrigerants, electricity and materials would	

		be minimised though design initiatives (SSI-5414 REMM Op GHG6). o SMTF would minimise GHG emissions (SSI-5931 REMM – Op GHG1). o SMTF would source at least 10%of the annual operational energy demand at the site (SSI-5931 REMM – Op GHG5)	

5.2 Operational Monitoring

5.2.1 Noise and Vibration

There are two components to noise and vibration monitoring for the operation of the Sydney Metro Northwest being:

- General operational noise and vibration monitoring of new activities in new areas (in accordance with the Works Approval Protocol) or in response to a community complaint; and
- To collect actual noise and vibration data for the purpose of undertaking a Noise and Vibration Compliance Assessment against the two Operational Noise and Vibration Reports (ONVRs).

Each of the ONVR documents prepared for the operation of the Sydney Metro Northwest contain predicted noise and vibration levels for the operational network, assumptions developed in generating the predictions, and also criteria against which the above Noise and Vibration Compliance Assessments must be undertaken. Each ONVR contains:

- Assessment criteria for: Airborne noise; Vibration; and Ground borne noise and vibration (GBNV);
- Key modelling inputs (assumptions);
- Predicted noise levels at each sensitive receiver identified in the land use surveys as being potentially impacted (including future development areas); and
- Proposed mitigation measures that have been implemented during the D&C Phase that have been developed to respond to the predicted noise levels.

Appendix E of this OEMP contains the criteria and assumptions developed in the ONVR against which all noise and vibration monitoring will be undertaken.

5.2.1.1 General Operational Noise and Vibration Monitoring

As provided above, the ONVR documents established the noise criteria for the operation of the Sydney Metro Northwest, as contained in Appendix E of this OEMP.

MTS will undertake noise and vibration monitoring as follows:

- Where the implementation of the Works Approval Protocol (Appendix D) finds that the proposed works or activity is occurring:
    - As part of the annual possession program and poses a new / changed risk;
    - For the first time, in a new area and are scheduled to occur between:
        - 2200 and 0700 – Sunday to Thursday; and / or
        - 2200 and 0800 – Friday to Sunday and Public Holidays.
- In response to a community complaint.

A Noise and Vibration Monitoring Procedure has been prepared by MTS and will be implemented during the operation of the new network. The Procedure includes:

- When the procedure should be implemented;
- The noise and vibration criteria;
- A noise and vibration monitoring record sheet.

5.2.1.2 Noise and Vibration Compliance Assessment Monitoring

The Sydney Metro Northwest Project is required to undertake noise and vibration monitoring for operation and maintenance activities and to undertake an assessment of the monitoring results against the criteria and predictions contained within each of the ONVR documents. Table 10 below outlines the CoA that the monitoring and noise assessment need to comply with and the approach that MTS proposes to employ to ensure that any monitoring meets the relevant industry standards, guidelines and agency requirements.

Table 10: Noise and Vibration Compliance Assessment Requirements and Approach

SSI#	COA REF:	COA REQUIEMENT	TIMEFRAME	DOCUMENT REFERENCE
5414 – Whole of Project	C17	Operational Noise Review of Stationary Facilities	Within 2 Years of commencement of O&M Phase.	This Operational Noise Review is completed, and report is attached as Appendix G
5414 – Whole of Project	C22	Noise and Vibration Compliance Assessment	Within 12 Months of commencement of O&M Phase.	Completed and report is attached as Appendix G
5931 – SMTF	F2	Operational Noise Review of Stationary Components	Within 2 Years of commencement of O&M Phase.	This Operational Noise Review is completed, and report is attached as Appendix G
5931 – SMTF	F5	Operation Noise and Vibration Compliance Assessment	Within 12 Months of commencement of O&M Phase	This Operational Noise Review is completed, and report is attached as Appendix G

As is illustrated in Table 10 above, there are four different assessments required to be undertaken, all of which are required to be submitted to the Secretary of DP&E within different timeframes. MTS implemented a regime of monitoring, reporting and assessment that meets the requirements of all four CoA above, removing the need to duplicate monitoring, modelling and assessment reports.

5.2.2 Water Quality

The REMM OpSW 16 for SSI-5414 requires that a "*surface water quality monitoring program*" be developed "*for the station precincts, services facilities and the stabling depot to monitor water quality upstream and downstream of the works*".

The MTS Water Monitoring Program will be implemented for all water quality monitoring and management for the operation of the Sydney Metro Northwest network.

Water Quality Monitoring will be undertaken by MTS through the operational life of the project as per the MTS Water Monitoring Program, and summarised as follows:

- At sites agreed with Council, EPA and other relevant government agencies (upstream and downstream of the asset alignment);
- On a quarterly basis, or otherwise:
  - After a significant rainfall event (>50mm in 48 hours); or
  - After a major spill or incident near to or within the alignment;
- In accordance with relevant guidelines; and
- Against the water quality criteria established below.

Water quality criteria that must be met prior to any offsite discharge to the environment or onsite reuse are provided in Table 11. Where field sampling is required, appropriately calibrated monitoring equipment as nominated below shall be used.

Table 11: General Water Quality Criteria

PARAMETER	PROJECT LIMITS	METHOD OF ASSESSMENT
Offsite discharge		
pH	6.5 – 8.5	pH meter
Total suspended solids	50 mg/L	Laboratory analysis
Turbidity*	50 NTU	Water quality meter
Oil and grease	None visible	Visual inspection
Colour	No visible discoloration	Visual inspection
Onsite reuse		
Oil and grease	None visible	Visual inspection
pH	6.5-8.5	pH meter

Additional criteria are to be applied to the Water Treatment Plant (WTP) located at Lady Game Drive, as identified in *Table 12* below.

Table 12: Lady Game Drive WTP Discharge Criteria

PARAMETER (ANALYTE)	PRJECT LIMITS (CRITERIA)
pH	7.0 – 8.5
Total Suspended Solids (mg/L)	–
Turbidity NTU)	0.5 – 10
Dissolved Oxygen (mg/L)	8.2 – 10
Oil and Grease (mg/L)	<5 or ND
Sulfate	–
Ammonia (mg/L)	2.8
Oxidised Nitrogen (mg/L)	7.2
Total Nitrogen (mg/L)	2.8
Total Phosphorus (mg/L)	0.03
Aluminium (mg/L)	0.69
Beryllium (mg/L)	–
Chromium (mg/L)	0.14
Copper (mg/L)	0.005
Iron (mg/L)	7.7
Lead (mg/L)	0.028
Manganese (mg/L)	10
Nickel (mg/L)	0.32
Tin (mg/L)	0.00175
Zinc (mg/L)	0.2
Coliforms (CFU/100mL)	–

5.2.3 Water Consumption

Potable and Non-Potable Water Targets detailed in Table 6 above, relate to the percentage target for non-potable water based on the availability of non-potable sources, Table 13 below detail the non-potable water targets by location, based on the availability of secure non-potable sources. That is, where recycled water mains are available, 100% of non-potable needs will need to be sourced from non-potable sources.

Table 13: Potable and Non-Potable Water Targets by Location

SOURCE	LOCATION	% OF NON-POTABLE TOTAL
Sydney Water Recycled Water Mains	• Kellyville; • Rouse Hill; Tallawong; • SMTF; and • Rouse Hill Bus Layover North and South.	100%
Rainwater Harvesting	• Cherrybrook; • Castle Hill; • Showground; • Norwest; Bella Vista; • Kellyville; Rouse Hill; • Tallawong; and • SMTF.	61% – 72%
Recycled Water (Train Wash Harvesting) capture	• SMTF.	80% – 86%

Table 14 below outlines how the non-potable water consumption targets outlined in Table 6 and Table 13 will be tracked and monitored, and the proposed monitoring method for water consumption at each identified source.

Table 14: Potable and Non-Potable Water Consumption Monitoring

	METHOD / SOURCE OF DATA COLLECTED	MONITORING FREQUENCY
Sydney Water Recycled Water Mains.	Sydney Water metering (invoicing) of recycled water consumed.	Monthly; and Quarterly as power bills arrive.
Rainwater Harvesting.	Sydney Water metering (invoicing) of potable water used consumed. On-site metering of rainwater capture system.	Monthly; and Quarterly as power bills arrive.
Recycled Water (Train Wash Harvesting).	Potable and Non-Potable water metres at train wash facility. Monitored by Building Management System.	Monthly.

Quarterly, as Reporting of water consumption will be undertaken as follows:

- Data capture bills arrive (through procurement team);
- Quarterly reporting on potable and non-potable water consumption;
- Annual reporting to include overall water consumption patterns.

The Environment and Sustainability Advisor will analyse the consumption data on an annual basis to identify:

- Performance against targets;
- Consumption trends; and
- Opportunities for improvement.

5.3 Energy Consumption

Energy consumption targets for the operation of the Sydney Metro Northwest are outlined in Table 6 above.

Data collection for consumption and generation will either be direct, based on MTS bills and metering, or indirect, where the information is collected from subcontractors. Table 15 below identifies the monitoring that will be undertaken for consumption and generation for the Project, including frequency of monitoring and form of data collection. The results of monitoring will inform future energy use initiatives.

Table 15: Energy Monitoring

	METHOD / SOURCE OF DATA	MONITORING FREQUENCY
SMTF Solar Generation	Meter reading.	Monthly.
Electricity Consumption	Meter reading; Power bills (gas and electricity as applicable).	Monthly (for estimate); Quarterly as bills are received.
Fuel Consumption	Fuel invoices (including diesel; petrol; biodiesel; LPG).	Monthly.
Data Collection from Sub-Contractors	Fuel invoices (including diesel; petrol; biodiesel; LPG); Power bills (gas and electricity as applicable); Details of the source of power used (e.g. % renewables, etc).	Monthly; and Quarterly as power bills arrive.

Reporting on energy consumption will be undertaken as follows:

- Data capture in registers monthly, as data is collected;
- Quarterly reporting on energy generated;
- Annual reporting to include overall generation trends.

The Environment and Sustainability Advisor will analyse the consumption and generation data on a six-monthly basis and to identify:

- Performance against targets;
- Consumption trends;
- Generation trends;
- Opportunities for improvement.

6 Roles and Responsibilities

6.1 Roles and Responsibilities

Environmental and Sustainability Performance is the responsibility of all members of the MTS team. Figure 4 below shows the organisational structure of the key environmental and sustainability management roles and responsibilities.

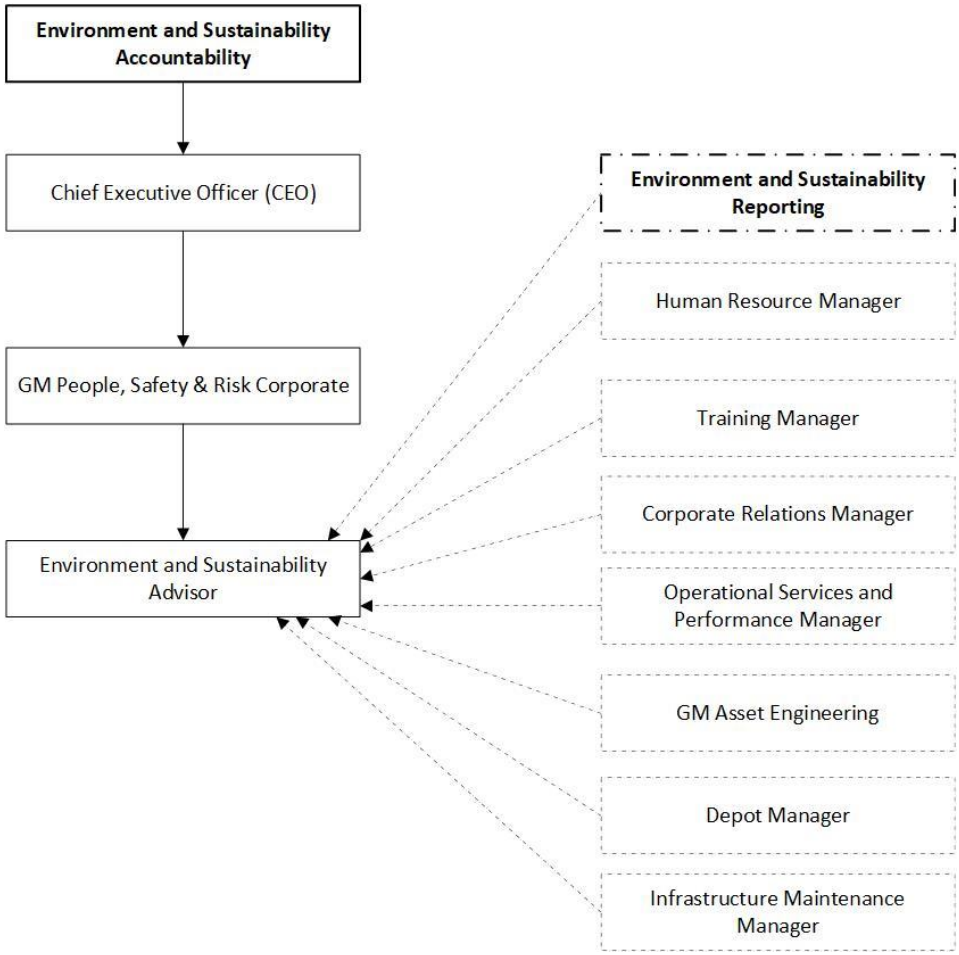

Figure 4 - MTS Organisational Chart

Figure 5 displays the hierarchy and key personnel directly responsible for all environmental management. These team members oversee the progress throughout the Contract Term.

Figure 5- Organisational structure - Quality, Safety & Environment

The GM Safety, Quality, Risk & Environment has the final authority in matters relating to the IMS. The Environmental Representative has the responsibility and authority to structure as part of the IMS documentation content in compliance with the requirements of AS/NZS ISO 14001.

Table 16 below outlines the responsibilities of key members of staff to ensure that the environmental and sustainability obligations of the Project are met, and that all members of staff and workforce are aware to their obligations and the project-wide targets for the Project.

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Table 16: MTS Roles and Responsibilities

ROLE	RESPONSIBILITIES
Chief Executive Officer (CEO)	The environmental responsibilities of the MTS CEO include, but are not limited to: Provision of O&M input and approves the design of the railway system, and facilities in the mobilisation period. Ensure the readiness of all systems and facilities for the operation of Sydney Metro Northwest. Development, implementation and continual review of all of the management system and related documents, necessary to provide a safe, reliable and efficient operation of the Sydney Metro Northwest, including the IMS.

	Responsible for the management of environmental and sustainability issues through compliance with the Environmental and Sustainability Policy and implementation of relevant requirements of MTS environmental management systems. To make decisions on the day-to-day business of MTS and O&M requirements for Sydney Metro Northwest.
GM Safety, Quality, Risk, Environment	The environmental responsibilities of the MTS GM SQRE include, but are not limited to: Be an emergency contact and available to be contacted by EPA, DP&E and The Sydney Metro Authority Representatives on a 24 hour basis; Endorse and support the MTS Environment and Sustainability Policy and this OEMP; Provide environmental leadership and ensure adequate resources are provided to effectively implement this OEMP. Provide sustainability leadership ensuring adequate resourcing to ensure targets are met and sustainability ratings are achieved and maintained. Provide environmental oversight, direction and leadership regarding the environmental and sustainability management of the Project. Provide sustainability oversight project-wide to ensure initiatives permeate all disciplines (e.g. procurement, training and workforce). Establishing the IMS in accordance with all legislative and other requirements. Including the OEMP. Assist in establishing ISCA rating fpr the operational network. To support the CEO-MTS on MTS operations and the management of stakeholders including, The Sydney Metro Authority, EPA and other State and Federal government bodies and other government agencies. Undertake regular formal reviews of the MTS IMS and update the IMS accordingly. Review the Project's management systems and key management plans to ensure and maintain compliance with the requirements of the MTS IMS, CoA and EPL. Ensure environmental incidents are managed and reported (to DP&E, EPA and Parent Companies) in accordance with the planning approval and EPL requirements. Ensure sustainability initiatives are implemented and targets met. Foster and maintain a positive environment and sustainability culture.
Environment and Sustainability Advisor	The environmental responsibilities of the MTS CEO include, but are not limited to: Obtain all required approvals to facilitate O&M of the Project, including but not limited to the EPL. Manage the ISCA rating for the O&M Phase of the Project. Develop the O&M Phase IMS for the Project. Implement the sustainability initiatives required to obtain sustainability ratings (e.g. ISCA and Green Star). Monitor implementation of sustainability initiatives and undertake actions of continual improvement where necessary. Monitor carbon, energy and potable water use to ensure compliance with sustainability targets.

	Undertake environmental risk assessment, and revisit this through the life of the project through continual review and improvement processes within the IMS. Key point of contact for environmental and planning approvals and sustainability stakeholders, including but not limited to DP&E, EPA; ISCA. Be an emergency contact and available to be contacted by EPA, DP&E and The Sydney Metro Authority Representatives on a 24 hour basis. Notify MTS, OpCo and agencies as required in response to environmental incidents and potential incidents. Act as the main point of contact for the Sydney Metro Authority environmental and sustainability teams and approval authorities. Identify and maintain a register of relevant legal, MTS IMS requirements, contractual and other requirements. Obtain all necessary approvals prior to commencing relevant works. Ensure the project induction includes appropriate training regarding the requirements of this OEMP, the EPL and any other key obligations. Ensure identified risks are analysed and evaluated according to agreed criteria. Regularly review identified risks and controls and maintain a risk register. Ensure regular inspections, observations, monitoring and audits are conducted to check the effectiveness of controls and that compliance is maintained. Identify, assess and leverage opportunities to achieve sustainability outcomes. Review subcontractors' performance and compliance with MTS environmental and sustainability requirements. Enter and close out all environmental incidents in the O&M Phase Reporting System. Identify and implement corrective and preventative actions after incidents and share lessons learned within the MTS team or other projects, as applicable. Provide input to the monthly, quarterly and annual project progress report (as required).
GM Asset Engineering	The environmental responsibilities of the GM of Asset Engineering include, but are not limited to: Ensure that the Design and Construction Contractors deliver fit for purpose systems that meet the project Deed and contracts requirements and satisfactorily address MTS's long- term interest, including meeting ISCA and The Sydney Metro Authority Sustainability Guideline obligations. Responsible for establishing and executing asset management strategy and asset management plan in full compliance with the Environmental and Sustainability Policy.
Human Resources Manager	The environmental responsibilities of the MTS HR Manager include, but are not limited to: • Establish and maintain operational training processes and procedures. • Responsible for ensuring sustainability Targets regarding workforce diversity are met.
Operational Services and	The environmental responsibilities of the MTS Compliance Manager include, but are not limited to:

Performance Manager	O&M related investigations, compliance inspections, and data and trend analysis to mitigate safety and environmental risks. Maintain MTS compliance with relevant environmental standards, and legal and regulatory requirements. Support the SHEQ Director with the delivery of key O&M milestones in alignment with MTS legal and regulatory requirements, business objectives and key performance indicators. Ensure preventative and corrective actions requested are completed within appropriate timeframes through efficient monitoring. Manage continuous improvement of the risk management process. Develop, maintain and continually improve the MTS EMS. Expected to operate reasonably independently, in accordance with MTS's policies; quality, safety and environmental management systems; processes and relevant legislation.
Training Manager	The environmental responsibilities of the MTS Training Manager include, but are not limited to: • Establish and maintain operational training processes and procedures. • Review and validate training course materials. • Manage the planning and delivery of efficient training, competence assurance and administrative functions. • Maintaining and monitoring competency records. • Work with Environment and Sustainability Manager to develop training packages addressing environmental risks. • Work with Environment and Sustainability Manager to develop training packages addressing sustainability initiatives. • Develop and implement the training delivery schedule for the O&M Phase, including environmental and sustainability aspects. • Operate reasonably independently, in accordance with MTS's policies; quality, safety and environmental management systems; processes and relevant legislation. • Responsible for ensuring sustainability targets regarding workforce legacy are met. • Implement sustainability initiatives for workforce training and diversity.
Depot Manager	The environmental responsibilities of the MTS Depot Manager include, but are not limited to: • Develop and implement efficient planning for the Depot and Rolling Stock asset maintenance activities. • Manage consumables, spares, materials and tools inventory control as well as budget and resources controls for rolling stock to meet MTS's sustainability objectives. • Manage compliance of depot assets and equipment condition with MTS asset performance standards, including sustainability requirements. • Expected to operate reasonably independently in accordance with MTS's policies; Safety, Quality and Environmental (SQE) management system, processes and relevant legislations.

Infrastructure Maintenance Manager	The environmental responsibilities of the MTS Infrastructure Maintenance Manager include, but are not limited to: • Expected to operate reasonably independently in accordance with MTS's policies; SHEQ management system, processes and relevant legislations. • Manage consumables, spares, materials and tools inventory control as well as budget and resources control for all infrastructure assets to meet MTS's business objectives and operational KPI's, including sustainability obligations.
Corporate Relations Manager	The environmental responsibilities of the MTS Corporate Relations Manager include, but are not limited to: Providing the delivery of internal and external communication (media, government and stakeholder relations); Corporate social responsibility; and Customer and community events.

6.2 Training and Continuing Education

To ensure that this OEMP is effectively implemented, each level of management is responsible for ensuring that all personnel reporting to them are aware of their obligations under this Plan. The Environment and Sustainability Advisor will coordinate the environmental training in conjunction with other training and development activities under the Project wide Training Management Plan. A training schedule will be developed by the Training Manager, with input from other disciplines, including Environment and Sustainability, and will be updated/amended throughout the life of the Project as training needs are identified.

6.2.1 Project Induction

All personnel, subcontractors and visitors will undergo an induction before commencing work on the network. Included in this induction will be a section on environmental and sustainability obligations. This is done to ensure all personnel involved in the operation and maintenance of the network are aware of the requirements of the OEMP and to ensure the universal understanding of relevant environmental risks, and management requirements. The induction addresses general and Project-specific environmental and sustainability issues, including, but not limited to:

- Environment and Sustainability Policy;
- Purpose and objectives of the OEMP;
- How the OEMP would be implemented;
- Requirements of due diligence and duty of care;
- Conditions of environmental licences, permits and approvals;
- High-risk environmental activities on the Project and their controls;
- What to do when working in or near environmentally sensitive areas;
- Sustainability objectives and requirements;

- What to do in the event of an environmental incident or emergency;
- Reporting and notification requirements for pollution and other environmental incidents, including the existence of the Pollution Incident Response Management Plan (PIRMP) and staff responsibilities with regard to the PIRMP.

The Environment and Sustainability Advisor may authorise amendments to the induction at any time. Possible reasons for changes to the induction may be project modifications, legislative changes, changes in environmental risks, the occurrence of incidents or amendments to this OEMP or related documentation.

6.2.2 Training and Awareness

Toolbox talks would be one method of raising awareness and educating personnel on issues related to all aspects of maintenance and repair activities in an operational rail environment, including environmental issues. The toolbox talks are used to ensure environmental awareness continues throughout the operational life of the network.

Training talks will be tailored to specific environmental issues relevant to upcoming works and will address environmental management measures and obligations for relevant personnel. Relevant environmental issues may include, but are not limited to:

- Noise minimisation measures (e.g. at surface sites, in particular on the viaduct);
- Emergency and spill response;
- Green Travel Plan and active transport initiatives;
- Water and pollution control (e.g. discharge management);
- Weed management (e.g. at surface sites and landscaped areas);
- Dust control (e.g. in ballasted areas);
- Unexpected Finds Procedures, for unknown heritage and contamination;
- Sustainability measures, including supply chain initiatives, water and energy conservation.

Targeted environmental awareness training would be provided to individuals or groups of workers with a specific authority or responsibility for environmental management, or those undertaking an activity with a high risk of environmental impact.

To promote environmental awareness across MTS, environmental alerts or HSEQ communications would be issued as required. EAMs would be made available or displayed, as appropriate, to promote awareness of environmental constraints affecting maintenance, repair and possession works.

A training schedule identifying relevant forums for environmental awareness training would be developed in accordance with the Project Training Management Plan and would be updated/amended throughout the operational life of the network as new training needs are identified or existing needs change, or in response to environmental incidents, and environmental alerts.

6.2.3 Environment and Sustainability Alerts

Safety, Health and Environment (SH&E) Alerts will be prepared as required for distribution within the Project or outside of the Project, where appropriate. SH&E Alerts may also be raised at the discretion of the Environment and Sustainability Advisor.

The SH&E Alerts will include updates specifically related to environmental and sustainability matters, including but not limited to, such things as:

- Sydney Metro Northwest environmental incident updates;
- Changes to licencing conditions;
- Changes to statutory requirements;
- Lessons learnt from incidents on other projects/ networks;
- Updates from parent companies or wider industry.

7 Incident and Emergency Response

7.1 Overview

The immediate response to all incidents is to make the area safe and undertake measures to prevent further harm to persons, property and the environment. The Environment and Sustainability Advisor and GM SQRE should be notified immediately in the event of an environmental incident.

Any environmental incident that might occur will be managed according to Pollution Incident Response Management Plan (PIRMP). The PIRMP provides the guidelines and procedures for MTS' response to incidents occurring on its network or in response to incidents as part of a larger multi-agency coordinated response.

The PIRMP provides details of the types of incidents, including environmental, that could potentially occur and describes the principles behind how MTS will respond to these. Types of environmental incidents applicable to the operation of the network include, but are not limited to:

- Spills of fuels, oils, chemicals and other hazardous materials;
- Unauthorised discharge from detention basins or other containment devices;
- Unauthorised clearing beyond the extent of the Project boundary or premises;
- Unauthorised damage or interference to threatened species, endangered ecological communities or critical habitat (only occurring beyond Project boundaries);
- Unauthorised harm or desecration to unknown Aboriginal objects and Aboriginal places;
- Unauthorised damage or destruction to any State or locally significant relic or Heritage item (beyond Project boundaries);
- Potential contamination of waterways or land;

- Any potential breach of legislation, including a potential breach of a condition of an EPL; CoA; or any agency permit condition;
- Works undertaken without appropriate approval or assessment under the EP&A Act 1979;
- Works undertaken that are not in accordance with a Project assessment;
- Unauthorised dumping of waste.

The IMF shows the different management structures for incident response, including four (4) incident severity levels, and criteria for classifying environmental incidents. The Framework includes references to legislation and regulatory requirements and links MTS's incident response documentation to other Rail Agencies' plans and procedures, as well as to other internal documents.

The IMF has been prepared to be consistent with the legislative requirements for environmental incident reporting, both under the planning approvals (MCoA) and the *Protection of the Environment Operations (POEO) Act 1997*, including the preparation of the Pollution Incident Response Management Plan (PIRMP).

7.2 Incident Notification

Environmental incidents shall be notified:

- Verbally immediately and in writing within 24 hours of an incident occurring to Sydney Metro Authority;
- By the Environment and Sustainability Advisor, GM SQRE, (or delegate); and
- To the relevant authorities and parent companies of the PPP as required.

7.2.1 Notification to EPA and Other Agencies

Where required in accordance with the Project environment protection licence (EPL) and the *Protection of the Environment Operations Act 1997* (POEO Act), notification to Environment Protection Authority (EPA) will be undertaken for any non-conformances with the conditions of the EPL and for pollution incidents.

MTS has prepared a Pollution Incident Response Management Plan (PIRMP) to comply with requirements set out in part 5.7A of the POEO Act and the *Protection of the Environment Operations (General) Regulation 2009*, which state that holders of an EPL must prepare, implement and test a PIRMP in relation to the activity to which that licence relates. The PIRMP shall be implemented immediately if an incident occurs that threatens or causes material harm to the environment.

If the Environment and Sustainability Advisor (or delegate) determines that an incident causes actual or potential harm to the health or safety of human beings, or to ecosystems that is not minor; or if actual or potential loss or property damage (including costs to prevent, mitigate or make good harm to the environment) associated with a pollution incident exceeds $10,000, then the relevant agencies and authorities will be notified immediately. Notifications will be undertaken in accordance with the Project's PIRMP.

7.2.2 Notification to the Secretary of DP&E

In accordance with CoA D6 of SSI-5931 and CoA D6 of SSI-5414, the MTS Environment and Sustainability Advisor, GM SQRE (or delegate) will notify the Secretary of any incident (other than those relating to the POEO Act) with actual or potential significant off-site impacts on people or the biophysical environment within 48 hours of becoming aware of the incident. MTS will provide full written details of the incident to the Secretary within seven days of the date on which the incident occurred.

In accordance with D7 of SSI-5931 MTS will meet the any requirements of the Secretary to address the cause or impact of any incident, reported under CoA D6, within any timeframe nominated by the Secretary.

7.2.3 Notification to Parent Companies and Proponent

The MTS CEO (or delegate) will notify the parent companies that comprise MTS Pty Ltd being, MTR, John Holland and UGL, as appropriate, in accordance with the severity and status of the incident.

The MTS CEO (or delegate) will notify the proponent, Sydney Metro Authority in accordance with the severity and status of the incident.

7.2.4 Reporting

All incidents will be recorded in the project wide PMS. Details of environmental incidents and resulting corrective or preventative actions will be included in internal monthly environmental reports. The Environment and Sustainability Advisor will identify trends in incidents and trends in root causes to suggest the nature of preventative actions which are warranted.

Incidents will also be included in quarterly compliance reports as discussed in Section 8 of this OEMP.

7.2.5 Incident Investigations

Depending on the severity of the event, the location of the incident, as well as any associated plant and equipment, is to be preserved until relevant data and evidence is collected. Environmental incidents, including community complaints, will be entered into and closed out in the PMS.

Incident investigations will be undertaken for all incidents. The level of investigation will be dependent on the classification of the incident. The incident investigation team will be comprised of staff selected by the GM SQRE based on the severity of the incident and the availability of experienced personnel.

As part of the incident investigation, corrective and preventative actions will be identified, assigned to the appropriate person and closed out according to set timeframes. Corrective actions will be assigned, tracked and closed out in the PMS. All corrective actions will include reference to the relevant incident record for ease of tracking.

Safety, Health and Environment (SH&E) Alerts will be prepared as required for distribution within the Project or outside of the Project, where appropriate. SH&E Alerts may also be raised at the discretion of the Environment and Sustainability Advisor and Safety Manager.

Any requirements of the Secretary or relevant public authorities to address the cause or impact of any incident at the SMTF will be undertaken in accordance with CoA D7 of SSI-5931.

8 Inspections, Auditing and Reporting

8.1 Environmental Inspections

8.1.1 MTS Environment and Sustainability Team

Regular environmental inspections of the Sydney Metro Northwest network (including the work of sub-contractors) would be undertaken as a form of surveillance conducted by members of the SQRE Team to evaluate the effectiveness of environmental controls. Inspections will consider high risk activities and processes, repair and maintenance works in environmentally sensitive areas and site preparedness for adverse weather conditions in active work areas (i.e. during possessions). Inspections will generally be undertaken weekly and after a significant climatic event. The findings of the inspections would be recorded on a site environmental inspection form.

Any remedial actions identified during the inspections will also be recorded on the checklist. The form will include a checklist of environmental aspects as prompts to ensure that the inspection considered all possible aspects. It will also include the responsible party and an appropriate timeframe to close out any remedial actions.

8.1.2 Sydney Metro Authority

The Sydney Metro Authority may undertake inspections of works sites (including the work of subcontractors) to evaluate the implementation, effectiveness and level of compliance of operation with this OEMP. Inspections by other agencies may occur periodically at the request of the agency/authority.

A member of the MTS SHREQ Team will participate in all environmental inspections. Deficiencies and remedial actions would be analysed and prioritised at the completion of the inspection. Timeframes for implementation of remedial / corrective actions would be agreed.

8.1.3 Targeted Inspections

In addition to the regularly programmed inspections MTS proposes to undertake targeted inspections for areas or activities that are considered to pose higher risks to the environment. These will be identified on a case by case basis by the Environment and Sustainability. An example of such targeted inspections would include the Lady Game Drive Water Treatment Plant to ensure that the water being discharged meets the treatment specification to which it is design to operate.

Other targeted inspections will be determined through the operational life of the network.

8.2 Auditing

Environmental audits would take a risk-based approach and would be conducted at regular intervals during operation of the network to ensure compliance. Audits will include works undertaken by sub-contractors. Internal and external environmental audits would be undertaken in accordance with *AS/NZS ISO 19011:2014 Guidelines for Auditing Management Systems*.

The Environment and Sustainability Advisor will ensure that auditing is undertaken in accordance with this OEMP and the MTS PMS, under which the IMS sits. An Auditing Program would be prepared. An indicative audit schedule for environmental and Sustainability Aspects is included in Table 17.

The Environmental Auditing outcomes, including corrective actions would be reported on to the Sydney Metro Authority Quarterly and Annually.

Table 17: Indicative Audit Schedule

AUDIT	DETAILS	TIMING	RESPONSIBILIY	RECIPIENT OF AUDIT REPORT
Environmental audit	Compliance with approval and legal requirements, The Sydney Metro Authority specifications, OEMP	Two annually: At least one external.	Environment and Sustainability Advisor	Sydney Metro Authority MTS Parent Companies
Sustainability audit	Compliance with the sustainability aspects in accordance with OTS Deed	Two annually: At least one external.	Environment and Sustainability Advisor	Sydney Metro Authority MTS Parent Companies
MCoA audit	Compliance with the MCoA of the various planning approvals.	Six-monthly.	Environment and Sustainability Advisor	Sydney Metro Authority MTS Parent Companies

8.3 Compliance Review

Appendix A of this OEMP outlines all the environmental and sustainability requirements and where they have been addressed, including:

- MCoA from SSI-5414;
- MCoA from SSI-5931;
- Approval Conditions from ECRL REF.

Included are details of each requirement and the document and relevant section of the document, in which the obligation is address.

An MTS Obligations Register for the O&M Phase of the Project will be developed as part of the IMS and will be reviewed monthly and reported on quarterly to monitor performance and compliance against these requirements.

In addition to the planning approvals conditions, MTS will track changes to relevant legislation, as listed below, through the MTS IMS (See section 4). Legislation that will be monitored includes relevant sections of the:

- *Protection of the Environment Operations Act 1997;*
- *Protection of the Environment (General) Regulation 2009;*
- *Protection of the Environment (Clean Air) Regulation 2010;*
- *Protection of the Environment (Waste) Regulation 2014;*
- *Sydney Water Act 1994.*

Legislation will be reviewed on an annual basis, or as any key changes of legislation and made public. Any changes impacting the operation and maintenance of the Sydney Metro Northwest will be identified and discussed with Sydney Metro Authority.

Where changes to legislation require changes to processes and / or procedures MTS documentation will be updated in accordance with the continual improvement and review processes discussed in Section 9.

8.4 Non-conformance, Corrective and Preventative Actions

A non-conformance is a failure to comply with a requirement, standard or procedure, such as the CoA, this OEMP or associated documents. Environmental non-conformances may be identified through improvement opportunities, regular environmental inspections or monitoring, internal or external audits, complaints, community consultation, observations or through incident management (refer to Sections 7 and 8). A Sydney Metro Authority Representative and/or a public authority may also raise a non-conformance or improvement notice.

Where non-conformances are identified during regular inspections, corrective actions are raised, and can be closed out within 72 hours, they will be tracked and closed out through the inspection records. All other non-conformances (i.e. those requiring longer than 72 hours to close out) will be recorded and reported as incidents in the IMS, embedded within the MTS Project wide Project Management System (PMS).

Following the identification of a non-conformance, corrective and/or preventative actions would be identified and assigned to the appropriate person with set timeframes. Timeframes would be set to ensure any chance of recurrence is eliminated as soon as practicable. The MTS IMS would be used to assign, track and close out corrective actions (except for those actions identified, tracked and closed out within 72 hours through inspection records). All corrective actions will include reference to the relevant incident record for ease of tracking.

The IMS would be reviewed regularly to ensure actions are being closed out in a timely manner. The status of corrective actions would be reported at least monthly for review at the

monthly management meeting. Non-conformances would be formerly reported in the Quarterly and Annual Performance Reports.

8.5 Internal Reporting

Additional reporting requirements identified in the Project documents are included in Table 18. Further reporting may be necessary as works progress. In such circumstances, Table 18 would be amended to reflect those changes in accordance with Section 9 for the revision of the OEMP.

Table 18: MTS Environmental and Sustainability Reporting Schedule

REPORT NAME	FREQ'Y	DETAIL	RESPONSIBILIY	REPORT RECIPIENTS
Quarterly Performance Report	Quarterly	A separate section or sub-report on the Quarterly Performance Report with reference Environment and Sustainability matters, including, but not limited to: Compliance status against environmental and sustainability requirements Performance against environmental key performance indicators; Details of, environmental incidents, emergencies, near misses; Results, findings, required actions of any internal or external audits; Sustainability performance against all sustainability targets; Data and an analysis of trends and actions to improve performance; Performance of workforce status; Workforce reporting data; and Corrective actions taken.	Environment & Sustainability Advisor	Sydney Metro Authority
Annual performance reports	Annually	A separate section or sub-report on the Annual Performance Report on OpCo's performance against OEMP, and must include as a minimum: Be suitable for publication on The Sydney Metro Authority's Sydney Metro Northwest project website; Detail overall performance against all sustainability targets; Demonstrate continuous improvement of environment and sustainability performance; Detail performance against environmental KPIs; Report using the Global Reporting Initiatives Framework;	Environment & Sustainability Advisor	Sydney Metro Authority

		Provide outcomes form independent assurance reports undertaken; and Compliance reporting against relevant requirements.		

8.6 DP&E Compliance Tracking Program

In accordance with Ministerial Conditions of Approval (D5 (SSI5414) and D5 (SSI-5931)) a Compliance Tracking Program (CTP) has already been developed for the Project for the D&C phase. The purpose of the Programs is to monitor compliance with the terms of the project approvals, primarily during the construction phase where possible environmental impacts are greatest.

As provided in the conditions the CTP is required to be maintained for a year after the cessation of construction works.

MTS will provide the Sydney Metro Authority with relevant information required for to meet the obligations required to be reported in the CTP under the MCoA for the Project.

The CTPs describe how the requirements of D5 would be met and sets out a program and frequency for compliance reporting and independent auditing. The compliance reporting required under the Compliance Tracking Programs records how the Ministers Conditions of Approval and environmental management measures have been addressed.

8.7 National Greenhouse Energy Reporting

Within the Quarterly Performance Report, Annual Performance Report or at such times agreed by MTS and Sydney Metro Authority. MTS will provide Emissions and Energy Data required under the National Greenhouse and Energy Reporting (NGER) Legislation.

Where required, MTS will provide emissions and energy date in the same manner, form and level of detail, based on the methods and at the same times as required by the Sydney Metro Authority.

MTS will retain records of its activities that are the basis of OpCo's Emissions and Energy Data for any financial year, for a period of not less than 7 years from the end of the year in which the relevant activities take place. Records may be reviewed, audited and verified by any persons appointed or authorised for that purpose by Sydney Metro Authority or relevant Authority.

8.8 Agency Reporting

Additional reporting requirements identified in the Project documents are included in Table 19. Further reporting may be necessary through the operational life of the network. In such circumstances, Table 19 would be amended to reflect those changes in accordance with Section 9 for the revision of the OEMP.

Table 19: External (Agency Reporting)

REPORT NAME	FREQUENCY	DETAIL	RESPONSIBILIY	REPORT RECIPIENTS
EPL Annual Return	Annually	Report on compliance with EPL Compliance.	Environment and Sustainability Advisor	EPA
Material harm report	Within seven days of incident causing or threatening material harm	Written details of notification of incidents causing or threatening material harm to the environment (refer also to Section 7 for initial notification).	Environment and Sustainability Advisor	EPA DP&E
EPA Requested Report	As requested	As requested by EPA.	Environment and Sustainability Advisor	EPA

9 CONTINUOUS IMPROVEMENT AND REVIEW

This section discusses the process for continuous improvement that MTS will follow to ensure adequate review of this OEMP, and relevant supporting documentation, is undertaken through the operational life of the Sydney Metro Northwest. It also discusses the processes that will be followed to provide for the revision of the OEMP to reflect any changes resulting from the reviews.

9.1 Management Reviews

Management reviews will be undertaken annually or as required as part of the MTS continual improvement process. Reviews will consider the suitability and effectiveness of the environmental management system and effectiveness and proper implementation of this OEMP. This may include the wider management team and a review of systems from other functional areas.

The review will consider:

- Opportunities to improve efficiencies of environmental management processes and practices;
- Client and agency feedback;
- Consideration of non-conformances and deficiencies;
- Consideration of effectiveness of corrective and preventative actions; and
- Changes or developments in the MTS IMS.

The outcomes of the reviews may result in the amendment of this OEMP or related documents, revision to the IMS, risk assessment review, re-evaluation of the Project's objectives and targets as well as feeding into other Project documents. Necessary system improvements would be identified and raised as corrective actions. Any changes to this OEMP would be managed in accordance with Section 9.2.

9.2 Revision of this Plan

Continual improvement is achieved through constant measurement and evaluation, audit and review of the effectiveness of the Plan, and adjustment and improvement of the OEMP, Project environmental outcomes and the MTS IMS. Annual Management Reviews provide specific opportunities to identify improvements in the IMS and/or this OEMP. This OEMP would be updated as required:

- To take into account changes to the environment or generally accepted environmental management practices, new risks to the environment, any hazardous substances, contamination or changes in law;
- Where requested or required by the DP&E or any other Authority;
- In response to internal or external audits or quarterly management reviews.
- The updated plan will be endorsed by the Environment and Sustainability Advisor and approved internally by the MTS CEO. Minor changes may be approved by the GM SQRE. Minor changes would typically include those that:
- Are editorial in nature (e.g. staff and Agency/Authority name changes);
- Do not increase the magnitude of impacts on the environment when considered individually or cumulatively;
- Are in response to audit findings or periodic reviews;
- Do not comprise the ability of the Project to meet approval or legislative requirements.

Appendix A.Compliance table

This table displays a description of the requirement and Page Number in outlining how this Operational Environment Management Plan (OEMP) evidences its compliance to the North West Rail Link (NWRL) OTS Project Deed Operations, Trains and Systems Exhibit 1 | Scope and Performance Requirements Appendix 54 – Project Plan Requirements at Section 3.34

CoA Reference ID	Description	Section
SSI-5414 F4 and SSI-5931 F7	*Note: CoA SSI-5414 F4 and SSI-5931 F7 are identical except for the aspects listed under part (f) of each CoA, and that the OEMP prepared to meet SSI-5414 must be provided to the Director General and made publicly available prior to operation.* Prior to the commencement of operation, or as otherwise agreed by the Director General, the Proponent shall prepare and implement (following approval) an Operational Environmental Management Plan for the SSI. The Plan shall outline the environmental management practices and procedures that are to be followed during the operation, and shall be prepared in consultation with relevant agencies in accordance with the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources, 2004). The Plan shall include, but not be limited to: (a) a description of activities to be undertaken during operation of the SSI (including staging and scheduling); (b) statutory and other obligations that the Proponent is required to fulfil during operation, including approvals, consultations and agreements required from authorities and other stakeholders under key legislation and policies; (c) overall environmental policies, guidelines and principles to be applied to the operation of the SSI;	This OEMP has been prepared to comply with both SSI-5414 F4 and SSI-5931 F7 in a single document. (a) Section 1.2; (b) Section 2; (c) Section 3; (d) Section 6; (e) Section 5; (f) Section 4 and Section 5. As required by SSI-5414 CoA F4 this OEMP has been provided to the Secretary (formerly Director General) and was made publicly available on NRT or Sydney Metro websites prior to commencement of first passenger services.

CoA Reference ID	Description	Section
	(d) a description of the roles and responsibilities for relevant employees involved in the operation of the SSI, including relevant training and induction provisions for ensuring that employees are aware of their environmental and compliance obligations under these conditions of approval; (e) an environmental risk analysis to identify key environmental performance issues associated with the operation phase; and (f) details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions will be undertaken to address identified potential adverse environmental impacts, including those safeguards and mitigation measures detailed in the documents listed under condition B1 (and any impacts arising from the staging of the construction of the SSI). In particular, the following environmental performance issues shall be addressed in the Plan: SSI-5414 F4(f): (i) traffic and transport; (ii) noise and vibration; (iii) ecology; (iv) visual amenity and landscaping (including in relation to heritage); (v) climate change and energy use (vi) surface water (including quality) and flooding (including emergency response planning); (vii) soils and groundwater management and discharge; (viii) waste and resource management; and (ix) air quality. SSI-5931 F7(f): (i) surface water, groundwater and flooding; (ii) groundwater; (iii) traffic and transport; (iv) noise and vibration; (v) visual amenity;	Note: MTS is not staging any of the operational activities of the Sydney Metro Northwest network.

CoA Reference ID	Description	Section
	(vi) vegetation; (vii) heritage; (viii) soil and contamination; (ix) air quality; (x) waste and resource management; and climate change and energy use.	

SSI-5414 – Operations, Trains, Systems (approved by DP&E 8 May 2013)

Table A1 below has been prepared by exception, and only contains the Ministers Conditions of Approval as applicable to the Operation Phase of the NRT Project. Conditions relating to the Design and Construct (D&C) Phase of the Project are to be closed out with the Department of Planning and Environment (DP&E) by TfNSW (Sydney Metro) and the D&C contractor(s) prior to the handover for Operation Phase and the commencement of this Operational Environmental Management Plan (OEMP).

TABLE A1: SSI-5414 MCoA

REQ'T	DESCRIPTION	DOCUMENT REFERENCE
SCHEDULE B		
ADMINISTRATIVE CONDITIONS		
TERMS OF APPROVAL		
B1	The Proponent shall carry out the SSI generally in accordance with the: (a) SSI Application SSI-5414; (b) North West Rail Link: Environmental Impact Statement - Stage 2 - Stations Rail infrastructure and Systems, dated October 2012; (c) North West Rail Link Submissions Report, Stage 2 - Stations Rail Infrastructure and Systems, incorporating Preferred Infrastructure Report, dated March 2013; and (d) conditions of this approval.	The OEMP has been prepared generally in accordance with the documents in this condition.

B2	In the event of an inconsistency between: (a) the conditions of this approval and any document listed from condition 81(a) to B1(c) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and (b) any document listed from condition B1(a) to B1(c) inclusive, and any other document listed from condition B1(a) to B1(c) inclusive, the most recent document shall prevail to the extent of the inconsistency.	Noted.
B3	In the event of an inconsistency between the terms of this approval and the staged infrastructure approval granted in respect of the North West Rail Link on May 6 2008 (MP06_1057), as modified from time to time, the terms of this approval (including the documents listed in 81) shall prevail to the extent of the inconsistency.	Noted.
B4	The Proponent shall comply with any reasonable requirement(s) of the Director General arising from the Department's assessment of: (a) any reports, plans or correspondence that are required and/or submitted in accordance with this approval; and (b) the implementation of any actions or measures contained within these reports, plans or correspondence.	Noted.
B5	Subject to confidentiality, the Proponent shall make all documents required under this approval available for public inspection on request.	Noted.
B6	This approval shall lapse 10 years after the date on which it is granted, unless the works the subject of this SSI approval are physically commenced on or before that date.	The works the subject of this SSI approval were substantially commenced, and complete prior to the date in which the approval is due to lapse.
LIMITS OF APPROVAL		

B7	This approval does not permit the construction of any buildings or the undertaking of uses that do not form part of the operation or are not ancillary to the SSI. This includes retail and commercial uses at stations and buildings and uses at residual redevelopment sites, unless required by the conditions of this approval. Interim and permanent approval of these buildings and uses shall be sought separately in accordance with the requirements of the Act.	OEMP Section 1.2 – Project Description.
STATUTORY REQUIREMENTS		
B8	The Proponent shall ensure that all licences, permits and approvals are obtained as required by law and maintained as required throughout the life of the SSI. No condition of this approval removes the obligation for the Proponent or its contractors to obtain, renew or comply with such licences, permits or approvals.	OEMP Section 2 – Planning and Approvals.
B9	The Proponent may elect to construct and/ or operate the SSI in stages. Where staging is proposed, the Proponent shall submit a Staging Report to the Director General prior to the commencement of the first proposed stage. The Staging Report shall provide details of: (a) how the SSI would be staged, including general details of work activities associated with each stage and the general timing of when each stage would commence; and (b) details of the relevant conditions of approval, which would apply to each stage and how these shall be complied with across and between the stages of the SSI. Where staging of the SSI is proposed, these conditions of approval are only required to be complied with at the relevant time and to the extent that they are relevant to the specific stage(s). The Proponent shall ensure that an updated Staging Report (or advice that no changes to staging are proposed) is submitted to the Director General prior to the commencement of each stage, identifying any changes to the proposed staging or applicable conditions.	Responsibility for staging remains with Sydney Metro Authority (TfNSW). The following Staging Reports have been prepared and lodged with DP&E: North West Rail Link Stage 1 Infrastructure Approval – Staging Report v1.2 (DoPI Comment Response) 20 December 201; North West Rail Link Stage 2 Infrastructure Approval – Staging Report Rev 1 (22 April 2014).

B10	The Proponent shall ensure that all plans, sub-plans and other management documents required by the conditions of this approval and relevant to each stage (as identified in the Staging Report) are submitted to the Director General no later than one month prior to the commencement of the relevant stages, unless otherwise agreed by the Director General. Note: These conditions do not relate to staged infrastructure within the meaning of section 115ZD of the EP&A Act.	MTS does not propose Staging of any documentation or operational activities.
B11	811. With the approval of the Director General, the Proponent may: (a) submit any strategy, plan, program (or the like) required by this approval on a progressive basis; (b) combine any strategy, plan, program (or the like) required by this approval; and (c) update corresponding strategies, plans and programs prepared to meet the requirements of State Significant Infrastructure Approval SSI-5100 for the purposes of meeting the requirements of the SSI. Notes. While any strategy, plan or program may be submitted on a progressive basis, the Proponent will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times; and if the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.	MTS does not propose Staging of any documentation.
COMPLIANCE		

B12	The Proponent shall ensure that any strategy, plan, program (or the like) incorporates mitigation measures identified in the documents listed in condition B1, as relevant, and as modified by this approval.	OEMP Appendix A – Compliance Tables
B13	The Proponent shall ensure that employees, contractors and sub-contractors are aware of, and the need to comply with, the conditions of this approval relevant to their respective activities.	OEMP Section 6 Roles and Responsibilities.
B14	The Proponent shall be responsible for environmental impacts resulting from the actions of all persons that it invites onto the site, including contractors, sub-contractors and visitors.	OEMP Section 6.2 Training and Continuing Education OEMP Appendix A – Compliance Tables.
SCHEDULE C - ENVIRONMENTAL PERFORMANCE		
DESIGN		
TRANSPORT AND ACCESS		
Parking Management Strategy		
C11	The Proponent shall prepare a Parking Management Strategy in consultation with the RMS, bus operators and Councils to manage car parking impacts at stations and adjoining areas as a result of the operation of the SSI. The Parking Management Strategy shall include, but not be limited to: (a) the provision of parking spaces consistent with those identified in EIS documentation, except as required by this approval; (b) the replacement of lost on street car parking in the vicinity of stations, where feasible and reasonable;	Requirement for monitoring one year prior to commencement will be met by the Sydney Metro Authority. This requirement was incorporated into each of the Station Access Plans (SSI 5414 C5-7) submitted to the DP&E: Bella Vista Station - NWRLOTS-NRT-BLV-EN-PLN-901816 Cherrybrook Station - NWRLOTS-NRT-CHE-EN-PLN-901812

	(c) the safe placement, access to (including safe pedestrian and cycle access) and management of parking; (d) a monitoring and reporting methodology for the utilisation of park and ride spaces and impacts on parking supply and turnover on adjoining streets at each station; and (e) the identification of measures to address on street parking impacts, such as resident parking schemes, should monitoring identify a significantly detrimental impact on local parking supply. The Proponent shall be responsible for the coordination of measures in consultation with the relevant Council. The Strategy shall be submitted to the Director-General and the reporting of monitoring incorporated into the Compliance Tracking Program. The monitoring shall be undertaken in conjunction with the monitoring under condition F3 and apply for a minimum of one year following commencement of operation.	Castle Hill Station - NWRLOTS-NRT-CSH-EN-PLN-901813 Cudgegong Road Station - NWRLOTS-NRT-CUD-EN-PLN-901179 (Tallawong Station) Kellyville Station - NWRLOTS-NRT-KVE-EN-PLN-901817 Norwest Station - NWRLOTS-NRT-NRW-EN-PLN-901815 Rouse Hill Station - NWRLOTS-NRT-RSH-EN-PLN-901818 Showground Station - NWRLOTS-NRT-SHW-EN-PLN-901814
C14	The SSI shall be designed and operated so as not to preclude the carrying of bicycles within stations, in station infrastructure and on rail vehicles.	This requirement has been satisfied by the D&C contractor and endorsed for closure by the Environmental Representative. OEMP Section 5 – Environmental Management and Monitoring. Green Travel Plan.
NOISE AND VIBRATION		
Operational Noise and Vibration		
C16	Rail line components of the SSI shall be designed and operated with the objective of not exceeding the airborne and ground-borne noise trigger levels at existing development, at	OEMP Section 5 – Environmental Aspects. MTS Procurement Sourcing Procedure.

	each stage of the SSI, as presented in the Interim Guideline for the, Assessment of Noise from Rail Infrastructure Projects (DECC and DoP, 2OO7). In particular, the final viaduct design shall incorporate feasible and reasonable methods and materials that will reduce radiated noise from the structure. For the purpose of this condition, existing development includes all development that at the date of this approval, has been carried out in the vicinity of the rail corridor and any such development approved prior to the determination of this SSI, but only to the extent that the location of sensitive receivers is known.	
C17	Stationary facilities (including but not limited to stations; the TSF; substations; and heating, ventilating and air conditioning equipment) shall be designed and operated with the objective of meeting operational noise levels derived from the NSW Industrial Noise Policy (NSW Government, 2000). In particular, the procurement of rail vehicles should facilitate reduced noise levels from train auxiliary systems, and public announcement systems at stations shall be designed and installed in accordance with best practice. Operational noise levels shall be reviewed within 2 years of commencement of operations and at any subsequent time as required by the Director General. The review shall have regard to the status of land use planning, any land use changes and the background noise environment within areas adjacent to the fixed facilities at the time of the relevant review. The Proponent shall submit the results of the review to the Director General. Any proposed changes to the operational noise levels as a result of the review shall be included in a revised ONVR.	OEMP Section 5 – Environmental Aspects. MTS Procurement Sourcing Procedure. Operational noise levels review (TK920-04F01 Compliance with C22 F5 and EPL R4.4 (r2)) was completed and submitted to DPIE Portal in Q3 2020. The report is included in Appendix F
C18	Road noise attributed to the operation of the SSI, shall be considered and mitigated with the objective of meeting the noise criteria presented in the Noise Road Noise Policy (DECCW, 2011).	This requirement has been satisfied by the D&C contractor and endorsed for closure by the Environmental Representative.

		This was completed as a part of the development of the detailed design and Operational Noise and Vibration review (ONVR) (SSI-5414 CoA C20). The NSW Road Noise Policy provides guidance on how to assess potential noise impacts and design criteria related to land use developments which generate additional traffic on existing roads. In station precinct areas, there is limited design opportunities to minimise road traffic noise impacts at existing sensitive receivers. The potential noise impacts at sensitive receivers near station precincts is identified in the relevant assessment section in the ONVR. If required, receiver-based mitigation measures (if required) will be implemented by TfNSW following the noise and vibration compliance assessment in accordance with SSI-5414 C22. The SSI-5414 ONVR (NWRLOTS-NRT-RTF-AV-RPT-105008) was completed and submitted to DPE Q1 2017. Evidence - SSI-5414 OPERATIONAL NOISE AND VIBRATION REVIEW (ONVR) (NWRLOTS-NRT-SWD-AV-RPT-105008 Rev B).
C19	The SSI shall be designed and operated with the objective of not exceeding the vibration goals for human exposure for existing sensitive receivers, as presented in Assessing Vibration: a Technical Guideline (DECC, 2006).	OEMP Section 5 – Environmental Aspects. MTS Procurement Sourcing Procedure.

		CLOSED FOR DESIGN Design - This was completed as a part of the development of the detailed design and ONVR. The SSI-5414 ONVR (NWRLOTS-NRT-RTF-AV-RPT-105008) was completed and submitted to DPE Q1 2017.
Operational Noise and Vibration Compliance		
C22	The Proponent shall undertake a noise and vibration compliance assessment to confirm the predictions of the noise assessment referred to in the ONVR (condition C20). The noise and vibration compliance assessment shall be developed in consultation with the EPA and be undertaken within twelve months of the commencement of operation of the SSI, or as otherwise agreed by the Director-General. The assessment shall include, but not necessarily be limited to: (a) noise and vibration monitoring and compliance assessment, to assess compliance with conditions C15 to C18 of this approval and the ONVR; (b) methodology for assessment; (c) details of any complaints received relating to operational noise and vibration impacts; (d) any required recalibration of the noise and vibration model taking into account considerations such as land use change; (e) an assessment of the performance and effectiveness of the applied noise and vibration mitigation measures; and (f) identification, if required, of further noise and vibration mitigation measures to meet the requirements of C15 to C18 of this approval and the objectives identified in the ONVR.	OEMP Section 5 – Environmental Management and Monitoring. Operational noise levels review (TK920-04F01 Compliance with C22 F5 and EPL R4.4 (r2)) was completed and submitted to DPIE Portal in Q3 2020. The report is included in Appendix F

	A Noise and Vibration Compliance Assessment Report providing the results of the assessment shall be submitted to the Director-General and the EPA within 60 days of its completion. If the assessment indicates an exceedance of the noise and vibration objectives identified in the ONVR, the Proponent shall implement further feasible and reasonable measures (where required) to mitigate these exceedances in consultation with affected property owners.	
SOIL, WATER QUALITY AND HYDROLOGY		
C32	Except as may be provided by an EPL, the SSI shall be constructed and operated to comply with section 120 of the Protection of the Environment Operations Act 1997, which prohibits the pollution of waters.	OEMP Section 2.2 – Legal and Other Requirements. MTS EPL 21247
Water Quality Monitoring Program		
C37	A Water Quality Monitoring Program shall be prepared and implemented to monitor impacts on surface and groundwater quality resources and wetlands during construction and operation. The Program shall be developed in consultation with the EPA, DPI (Fisheries), NOW and relevant Councils and shall include but not necessarily be limited to: (a) identification of surface and groundwater quality monitoring locations which are representative of the potential extent of impacts from the SSI. This should include representative locations near the discharge point of the Lady Game Drive Water Treatment Plant; (b) identification of the water quality parameters to be monitored at each location; (c) identification of works and activities during construction and operation of the SSI, including emergencies and spill events, that have the potential to impact on surface water quality of potentially affected waterways; (d) presentation of parameters and standards against which any changes to water quality will be assessed, having regard to the principles of the Australian and New Zealand	The D&C Contractor prepared a Water Quality Monitoring Program in accordance with the requirements of this condition, which was submitted to and approved by the then Director General prior to the commencement of construction. Construction Soil and Water Management Plan for Sydney Metro Northwest Operations, Trains and Systems PPP (NWRLOTS-NRT-PRD-PM-PLN-000852). This Program is currently being implemented, and the requirements of sub-section (g) will be addressed at the time of construction completion, potentially closing compliance against this entire condition subject to the recommendation of the independent expert.

	Guidelines for Fresh and Marine Water Quality 2000 (AN ÊCC, 2000), and identification of 'trigger points' for further investigation or action to be taken; (e) representative background monitoring of surface and groundwater quality parameters, to establish baseline water conditions, unless otherwise agreed by the Director General; (f) identification of the frequency of water sampling during background, and construction monitoring periods; (g) a minimum monitoring period of three years following the completion of construction or until the affected waterways and/ or groundwater resources are certified by an independent expert as being rehabilitated to an acceptable condition; (h) contingency and ameliorative measures in the event that adverse impacts to water quality relevant to the SSI are identified; and (i) reporting of the monitoring results to the Department, EPA, DPI, NoW and relevant Councils. The Program shall be submitted to the Director General for approval prior to the commencement of construction of the SSI, or as otherwise agreed by the Director General. A copy of the Program shall be submitted to the EPA, DPI (Fishing and Aquaculture) and NOW prior to its implementation. The Water Quality Monitoring Program, prepared to meet condition C11 of State Significant Infrastructure approval SSI-5100, may be revised, if necessary and resubmitted.	
Groundwater		
C39	The Proponent shall take all feasible and reasonable measures to limit operational groundwater inflows into the tunnels to no greater than 0.5 ML/day.	DESIGN COMPONENT CLOSED

		This requirement has been considered and addressed in the indicative design reports certified by the IC: Bella Vista Station Civil - NWRLOTS-NRT-BLV-CW-RPT-451600 Attachment 1 - Section A1.9 Tunnel Drainage Design - NWRLOTS-NRT-SWD-DR-RPT-546680 Attachment 16.2 - Section 6.2.1 Corridor Earthworks-Drainage - NWRLOTS-NRT-BTK-CW-RPT-555651 Sections 6.6.5, 6.6.6, 8.12.3, 8.12.3 and 8.12.6 Cherrybrook Station Civic - NWRLOTS-NRT-CHE-CW-RPT-411600 Section 6.7
C40	The management of groundwater and surface water ingress into the station boxes and tunnels, including the design of capture, monitoring, treatment and discharge methods shall be undertaken in consultation with the EPA.	This requirement has been considered and addressed in the indicative design reports certified by the IC: Tunnel Drainage Design - NWRLOTS-NRT-SWD-DR-RPT-546680 Attachment 16.2 - Section 6.2.1 Cudgegong Road Station Civil - NWRLOTS-NRT-CUD-CW-RPT-481600 Section 6.5.6 and Attachment 1 - Section A1.4 (Tallawong Station)
C41	The Proponent shall ensure that groundwater which is treated at the Lady Game Drive water treatment plant is not discharged into the Lane Cove River without first meeting the discharge criteria outlined in Table 8.5 of the document referred to in condition 81(b). The Proponent shall review the discharge criteria in consultation with the EPA to ensure the level of discharge will not cause pollution of waters.	OEMP Section 5 – Environmental Management and Monitoring. OEMP Appendix D – Works Approval Protocol.

		This requirement has been considered and addressed in the design report certified by the IC: Tunnel Drainage Design - NWRLOTS-NRT-SWD-DR-RPT-546680 Section 2.1.
	Urban Design	
C44	The Proponent shall, prior to the commencement of permanent built works and/or landscaping, unless otherwise agreed by the Director-General, prepare and implement an Urban Design and Corridor Landscape Plan for the corresponding permanent built works and/or landscaping. The Plan shall be submitted to the Director-General and made publicly available. In preparing the Plan, the Proponent shall consult with the Department (Land Release), RMS, relevant Councils and the community. The Plan shall be prepared by appropriately qualified person(s) and detail the design initiatives to integrate rail infrastructure, stations and facilities into their existing and proposed settings, and landscaping measures to minimise, mitigate and/or offset the impacts of the SSI (including acoustic barriers and embankments/cuttings) on property and other land uses (such as open space), visual amenity and local vistas and heritage values. The Plan shall include, but not necessarily be limited to: (a) identification of design objectives and standards based on local environmental and heritage values, strategic and statutory planning, future land release form and function, sustainable design and maintenance, transport and land use integration, passenger and community safety and security, community amenity and privacy, and relevant design standards and guidelines; (b) details on the plans to provide, mitigate and/or augment landscaped areas and elements, with landscaping works to enhance ecological values, including riparian areas and fauna corridors, the provision of water sensitive urban design initiatives and to mitigate impacts to heritage landscapes;	OEMP Section 5 Environmental Management and Monitoring. This has been closed for design.

	(c) design details of the built elements of the SSI, including retaining walls, embankments, viaducts, culverts, bridges and underpasses, noise barriers, train stabling facility, and substations, and the measures to minimise the impact of these elements, particularly with respect to the impacts on adjoining residences, educational facilities, open space areas and heritage items and landscapes, including the recommendations of the Visual Impact Strategy (condition C27); (d) specific plans for station precincts to provide high quality sustainable stations that enhance the public domain and provide for active uses, ensure intermodal integration and equitable and safe access, including connectivity of the stations to surrounding precincts and integration into strategic planning directions for these areas consistent with Station Access Plan(s) (condition C5); (e) details on pedestrian and cycle access elements and fixtures, including crossings, secure cycle facilities, and other fixtures such as seating, lighting, fencing and signs etc, to enhance connectivity and the provision of a safe and secure environment consistent with the Pedestrian and Cyclist Network Facilities Strategy (condition C10); (f) details on parking elements and how commuter parking areas at stations shall be designed to minimise amenity impacts and so as not to preclude or prejudice the future functionality of town centres consistent with the Parking Management Strategy (condition C11); (g) details on public art and heritage (indigenous and non-indigenous) interpretation installations; (h) implementation, management and monitoring strategies to ensure the establishment and ongoing maintenance of built elements and landscaped areas, including performance standards; and (i) consideration of relevant design standards, such as the Sustainable Design Guidelines for Stations, Commuter Car Parks and Maintenance Facilities (2011), Bridge Aesthetics Design guidelines to improve the appearance of bridges in NSW (2012), Guidelines for the	

	Development of Public Transport Interchange Facilities (2008) and Crime Prevention Through Environmental Design Principles, and relevant Agency and Council design standards. The Plan shall be endorsed by an independent Design Review Panel. The Design Review Panel shall consist of appropriately skilled professionals in the fields of architecture, landscape design, transport integration and heritage. The Panel representatives shall be approved by the Director-General.	
HAZARDS AND RISK		
C45	Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with: (a) all relevant Australian Standards; (b) for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and (c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (EPA, 1997). In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirement shall prevail to the extent of the inconsistency.	OEMP Section 4.3 Environmental Management and Monitoring. OEMP Section 7 – Incident and Emergency Response. Safety Management System. Spill Management Procedure. Rail Operating Manual (Hazardous Goods).
WASTE MANAGEMENT		
C46	Waste generated outside the site shall not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.	OEMP Section 5 – Environmental Management and Monitoring. OEMP Section 5 – Environmental Aspects.

SCHEDULE D - COMMUNITY INFORMATION, REPORTING AND AUDITING		
COMPLIANCE MONITORING AND TRACKING		
Compliance Tracking Program		
D5	The Proponent shall develop and implement a Compliance Tracking Program to track compliance with the requirements of this approval. The Program shall be submitted to the Director General for approval prior to the commencement of construction and operate for a minimum of one year following commencement of operation. The Program shall include, but not necessarily be limited to: (a) provisions for the notification of the Director General prior to the commencement of construction of the SSI (including prior to each stage, where works are being staged); (b) provisions for periodic review of the compliance status of the SSI against the requirements of this approval; (c) provisions for periodic reporting of compliance status to the Director General, including a Pre-Construction Compliance Report, during construction reporting, and a Post-Construction Compliance Report; (d) a program for independent environmental auditing in accordance with ISO 19011:2003 - Guidelines for Quality and / or Environmental Management Systems Auditing; (e) mechanisms for recording environmental incidents during construction and actions taken in response to those incidents (f) provisions for reporting environmental incidents to the Director General and relevant public authorities during construction;	OEMP Section 8.6 – Compliance Tracking Program

	(g) procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management; and (h) provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	
Incident Reporting		
D6	The Proponent shall notify the Director General of an incident with significant off-site impacts on people or the biophysical environment as identified by the Environmental Representative within 48 hours of becoming aware of the incident. The Proponent shall provide full written details of the incident to the Director General within seven days of the date on which the incident occurred.	OEMP Section 7.3 – Incident Reporting.
SCHEDULE F - OPERATIONAL ENVIRONMENTAL MANAGEMENT		
OPERATIONAL PERFORMANCE		
Maintenance		
F1	The ongoing maintenance and operation costs of urban design and landscaping items and works implemented as part of this infrastructure approval shall remain the Proponent's responsibility until satisfactory arrangements have been put in place for the transfer of the asset to the relevant entity. Prior to the transfer of assets, the Proponent will maintain items and works to the design standards established in the Urban Design and Landscape Plan required by condition C44.	OEMP Section – 5 Environmental Management and Monitoring. Urban Design and Landscape Plan. Asset Information System and Station Operations Manual (ROM).
Operation Performance Audit Report		

F2	Within fifteen months of the completion of construction, or as otherwise agreed by the Director General, the Proponent shall commission an independent qualified person or team to undertake an Operational Performance Audit of the SSI. The independent person or team shall be approved by the Director General prior to the commencement of the Audit. The Operational Performance Audit Report shall be submitted to the Director General within one month of the completion of the Audit, unless otherwise agreed by the Director General. The Audit shall: (a) assess compliance with the requirements of this approval, and other licences and approvals that apply to the SSI; (b) assess the environmental performance of the SSI against the predictions made and conclusions drawn in the documents referred to under condition 81 of this approval; and (c) review the effectiveness of the environmental management of the SSI, including any environmental impact mitigation works.	OEMP Section 8.2 – Auditing. The independent environment audit was conducted within 15 months by an independent auditor approved by DPIE.
Traffic monitoring		
F3	Traffic changes on local roads around each station shall be monitored. Monitoring shall be undertaken 12 months before opening and for a period of no less than 12 months after opening. Should monitoring indicate unacceptable traffic intrusion on local roads/ streets as a result of SSI operation reasonably beyond that predicted in the EIS and/or Station Access Plans (condition C5), appropriate traffic management measures to mitigate the impacts of intrusive traffic in affected areas shall be implemented following consultation with the RMS and the relevant Council(s).	Sydney Metro Authority Responsibility.
OPERATIONAL ENVIRONMENTAL MANAGEMENT		

F4	Prior to the commencement of operation, or as otherwise agreed by the Director General, the Proponent shall prepare and implement (following approval) an Operational Environmental Management Plan for the SSI. The Plan shall outline the environmental management practices and procedures that are to be followed during the operation, and shall be prepared in consultation with relevant agencies in accordance with the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources, 2004). The Plan shall include, but not be limited to: (a) a description of activities to be undertaken during operation of the SSI (including staging and scheduling); (b) statutory and other obligations that the Proponent is required to fulfil during operation, including approvals, consultations and agreements required from authorities and other stakeholders under key legislation and policies; (c) overall environmental policies, guidelines and principles to be applied to the operation of the SSI; (d) a description of the roles and responsibilities for relevant employees involved in the operation of the SSI, including relevant training and induction provisions for ensuring that employees are aware of their environmental and compliance obligations under these conditions of approval; (e) an environmental risk analysis to identify key environmental performance issues associated with the operation phase; and (f) details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions will be undertaken to address identified potential adverse environmental impacts, including those safeguards and mitigation measures detailed in the documents listed under condition B1 (and any impacts arising from the staging of the construction of the SSI). In particular, the following environmental performance issues shall be addressed in the Plan: (i) Traffic and Transport;	This OEMP.

	(ii) Noise and Vibration; (iii) Ecology; (iv) Visual Amenity and Landscaping (including in relation to Heritage; (v) Climate Change and Energy Use (vi) Surface Water (including quality) and Flooding (including emergency response planning); (vii) Soils and Groundwater Management and Discharge; (viii) Waste and Resource Management; and (ix) Air Quality. The Plan shall be provided to the Director General and made publicly available prior to operation.	

TABLE A2: SSI-5414 REVISED ENVIRONMENTAL MITIGATION MEASURES

REQ'T	DESCRIPTION	HOW ADDRESSED
Contamination		
Op SG2	Procedures to quickly address any contaminant spill or accident would be developed and implemented during operation of the station sites.	OEMP; Spill Management Procedure.
Groundwater Management		
Op SG3	Groundwater quality would be subject to testing. Where it does not meet license requirements it would be treated prior to discharge.	OEMP; Environment Protection Licence; Trade Waste Licence;

		Works Approval Protocol; Discharge Procedure.
Groundwater Treatment		
Op SG4	Water treatment of captured groundwater from NWRL is to be treated at the existing water treatment plant located at Lady Game Drive, Lindfield. The incremental increase in volume from the NWRL would be accommodated within the existing capacity of the ECRL facility as long as water quality criteria can be met.	OEMP; Environment Protection Licence; Works Approval Protocol; Discharge Procedure.
Op SG5	All feasible and reasonable opportunities would be identified for the reuse of captured groundwater.	OEMP Section 5 – Environmental Aspects
Traffic and Transport		
Op T1	Advisory and way finding signage would be used to provide multi modal guidance to, from and within the station precincts.	Green Travel Plan; Provision of adequate parking at SMTF (office and maintenance sites); Provision of significant parking facilities at stations.
Op T2	Maximising pedestrian accessibility to the stations with a view to reducing car based travel to and from the stations.	Green Travel Plan; Provision of adequate parking at SMTF (office and maintenance sites);

		Provision of significant parking facilities at stations.
Op T3	Provision of cycle storage facilities at stations to increase the opportunity and catchment for non-motorised forms of transport to and from the stations.	Green Travel Plan; Provision of adequate parking at SMTF (office and maintenance sites); Provision of significant parking facilities at stations.
Op T4	Provision of commuter car parking at selected stations to reduce total car based trip lengths and encourage the use of rail.	Green Travel Plan; Provision of adequate parking at SMTF (office and maintenance sites); Provision of significant parking facilities at stations.
Noise and vibration		
Op NV4	The implementation of feasible and reasonable noise and vibration mitigation measures such as: Resilient rail fasteners provided on the viaduct and rail bridges.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure.

Op NV6	The implementation of feasible and reasonable noise and vibration mitigation measures such as: Investigate the option of managing train speeds between Kellyville Station and Rouse Hill Station. The investigation would consider factors such as the impact to journey times and the receivers existing noise exposure from road traffic.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure.
Op NV7	The implementation of feasible and reasonable noise and vibration mitigation measures such as: Standard, high and very high track attenuation provided through the tunnel section as shown indicatively in Figure 10 3.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure.
Op NV8	The implementation of feasible and reasonable noise and vibration mitigation measures such as: The design of the sheds and equipment for the train wash and wheel lathe facilities would include noise mitigation as required in order to comply with the applicable noise criteria at the nearest noise sensitive receivers.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure.

Op NV9	The implementation of feasible and reasonable noise and vibration mitigation measures such as: Investigate the option to incorporate silencers in the compressed air lines of the rolling stock to reduce noise associated with brake air release events.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure.
Op NV10	The implementation of feasible and reasonable noise and vibration mitigation measures such as: Investigate methods to minimise rolling stock auxiliary noise levels during procurement.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; Noise and Vibration Monitoring Procedure.
Op NV11	The implementation of feasible and reasonable noise and vibration mitigation measures such as: Noise sources at stations such as PA systems, air conditioners, substations and mechanical plant would be designed to meet the INP noise criteria.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; Noise and Vibration Monitoring Procedure.

Op NV12	The implementation of feasible and reasonable noise and vibration mitigation measures such as: Options would be investigated as part of the detailed design to reduce noise impacts from the operational car parks at Cherrybrook and Showground.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure.
Op NV13	A detailed assessment of the road traffic noise impacts, including identification of preferred mitigation measures for the station access roads at Cherrybrook and Kellyville would be undertaken during detailed design.	OEMP – Section 5 Environmental Aspects and Appendix E; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure.
European Heritage		
Op EH1	Maintain the vegetation retained, reinstated and planted during the construction phase.	OEMP; Environmental Aspects Maps; Unexpected finds procedure;

		Inspections of landscape areas under the Asset Information System and Station Operations Manual (ROM).
Indigenous Heritage		
OP IH1	Maintenance would be undertaken, for any permanent public interpretation within new railway stations.	OEMP; Environmental Aspects Maps; Unexpected finds procedure.
Ecology		
Op E2	Noxious and environmental weeks would be controlled within the operational site boundary.	OEMP (weed management); Environmental Aspects Maps; Fauna handling procedure; Rail Operating Manuals; Unexpected finds procedure.
Op E4	Best Practice Guidelines – Green and golden Bell Frog Habitat (DECC, 2008) would be followed during operation to protect and maintain any ephemeral breeding habitat for Green and Golden Bell Frog established as a result of the project.	No Green and Golden Bell Frogs habitat was established as part of the design and/ or construction of the new network. Fauna handling procedure.

Visual Amenity		
Op V10	The design and ongoing maintenance of the project would adopt CPTED principles, including the maintenance of unobstructed views into and outside of underpasses, effective drainage and ventilation, wide corridors and appropriate lighting.	Urban Design and Landscape Plan; Inspections regarding the public area and rail corridor cleanliness, condition and graffiti, under the Asset Information System and Station Operations Manual (ROM).
Climate change and Greenhouse Gas Emissions		
Greenhouse Gas		
Op GHG1	The NWRL would minimise GHG emissions through energy reduction and avoidance, energy efficiency and onsite and offsite renewable or low carbon energy in accordance with the NWRL Environment and Sustainability Policy.	OEMP – Section 5; and Sustainability Ratings.
Op GHG2	Options would be explored for offsetting 100% of carbon emissions associated with the use of electricity during operation of the project.	Sydney Metro Authority Responsibility, with MTS providing all the information required relating to its activities to enable SM to comply with this mitigation measure.
Op GHG3	Options would be explored for offsetting a portion of carbon emissions associated with the annual operational energy demand at precincts (including car parks) from onsite renewable or low carbon sources.	OEMP – Section 5 Environmental Aspects.
Op GHG4	The NWRL would source at least 5% of the annual operational energy demand at the station buildings from onsite renewable or low carbon sources.	OEMP – Section 5 Environmental Aspects; and

		Sustainability Ratings (ISCA, Green Building, TfNSW Sustainable Design Guidelines.
Op GHG5	The NWRL would source at least 10% of the annual operational energy demand at the Tallawong Stabling Facility (not including that required for traction) from onsite renewable or low carbon sources.	OEMP – Section 5 Environmental Aspects; and Sustainability Ratings (ISCA, Green Building, TfNSW Sustainable Design Guidelines.
Op GHG6	GHG emissions arising from use of refrigerants, electricity and materials would be minimised though design initiatives incorporated into the NWRL stations, rail infrastructure and systems. Example initiatives include, but are not limited to, maximising regenerative braking, natural ventilation, daylighting, energy efficient Heating, Ventilation and Air Conditioning (HVAC) and selection of material with low embodied materials.	OEMP – Section 5 Environmental Aspects; and Sustainability Ratings (ISCA, Green Building, TfNSW Sustainable Design Guidelines.
Surface Water and Flooding		
Op SW 1	Procedures to quickly address any contaminant spill or accident would be developed and implemented during operation of the station sites.	OEMP; Environmental Aspects Maps. Water Monitoring Program; Environment Protection Licence; Trade Waste Licence; Works Approval Protocol;

		Emergency and Incident Response Framework; and Discharge Procedure.
Op SW2	All feasible and reasonable opportunities for captured surface water reuse would be utilised in the first instance.	OEMP; Environmental Aspects Maps. Water Monitoring Procedure; Environment Protection Licence; Trade Waste Licence; Works Approval Protocol; Emergency and Incident Response Framework; and Discharge Procedure.
Op SW3	Surface water discharge quality would be required to comply with the relevant EPL.	OEMP; Environmental Aspects Maps. Water Monitoring Procedure; Environment Protection Licence; Trade Waste Licence; Works Approval Protocol;

		Emergency and Incident Response Framework; and Discharge Procedure.
Op SW16	A surface water quality monitoring program would be developed post construction for the station precincts, services facilities and the stabling depot to monitor water quality upstream and downstream of the works. Monitoring procedures and performance criteria would be established in consultation with local councils and relevant government agencies.	This Program and response to CoA37; OEMP Section 5 Monitoring; Water Monitoring Program; Environment Protection Licence; Works Approval Protocol; Emergency and Incident Response Framework; and Discharge Procedure.
Air Quality		
Op A1	Develop an OEMP including Air Quality section.	OEMP; Operational Maintenance Plan; Plan Maintenance Schedule; Rail Operating Manuals.
Waste and Resource Management		

Op W1	Develop an OEMP including a section on Operational Waste and Resource Recovery Management. This would detail opportunities for avoiding waste generation and responsible disposal methods for different waste streams.	OEMP – Section 5 Environmental Aspects; Waste Management Procedure; Waste Dockets; Rail Operating Manuals (hazardous good).
Cumulative Impact		
Op C1	Internal and external cumulative impacts for the operation of the NWRL would be managed and mitigated through a project wide OEMP.	OEMP.

SSI-5931 – Rapid Transit Rail Facility (approved by DP&E 15 January 2014)

Table A3 below has been prepared by exception, and only contains the Ministers Conditions of Approval as applicable to the Operation Phase of the NRT Project. Conditions relating to the Design and Construct (D&C) Phase of the Project are to be closed out with the Department of Environment and Heritage (DP&E) by TfNSW (Sydney Metro) and the D&C contractor(s) prior to the handover for Operation Phase and the commencement of this Operational Environmental Management Plan (OEMP).

TABLE A3: SSI-5931 MCoA

REQ'T	DESCRIPTION	DOCUMENT REFERENCE

SCHEDULE B – ADMINISTRATIVE CONTROLS		
TERMS OF APPROVAL		
B1	The Proponent shall carry out the SSI generally in accordance with the: (a) SSI Application SSI-5931; (b) Tallawong Road, Rouse Hill Rapid Transit Rail Facility: Environmental Impact Statement, dated 29 July 2013; (c) Tallawong Road, Rouse Hill Rapid Transit Rail Facility: Response to Submissions Report, dated 21 October, 2013; and (d) conditions of this approval.	The OEMP has been prepared generally in accordance with the documents in this condition.
B2	In the event of an inconsistency between: (a) the conditions of this approval and any document listed from condition 81(a) to B1(c) inclusive, the conditions of this approval shall prevail to the extent of the inconsistency; and (b) any document listed from condition B1(a) to 81(c) inclusive, and any other document listed from condition B1(a) to B1(c) inclusive, the most recent document shall prevail to the extent of the inconsistency.	Noted.
B3	In the event of an inconsistency between the terms of this approval and the staged infrastructure approval granted in respect of the North West Rail Link on May 6 2008 (MP06_1057), as modified from time to time, the terms of this approval (including the documents listed in 81) shall prevail to the extent of the inconsistency.	Noted.
B4	The Proponent shall comply with any reasonable requirement(s) of the Director General arising from the Department's assessment of: (a) any reports, plans or correspondence that are submitted in accordance with this approval; and	Noted.

	(b) the implementation of any actions or measures contained within these reports, plans or correspondence.	
B5	Subject to confidentiality, the Proponent shall make all documents required under this approval publicly available.	Noted.
LIMITIS OF APPROVAL		
B6	This approval shall lapse 10 years after the date on which it is granted, unless the works the subject of this SSI approval are physically commenced on or before that date.	OEMP Section 1.3 – Project Description.
STATUTORY REQUIREMENTS		
B7	The Proponent shall ensure that all licences, permits and approvals are obtained as required by law and maintained as required throughout the life of the SSI. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals.	OEMP Section 2 – Planning and Approvals.
B8	Any changes to the scope of the infrastructure activity shall be subject to a consistency review. Should the review identify activity scope and environmental impacts inconsistent with the assessed infrastructure activity, a modification to the infrastructure activity approval would be required.	Noted.
B9	The Proponent may elect to construct and/ or operate the SSI in stages. Where staging is proposed, the Proponent shall submit a Staging Report to the Director General prior to the commencement of the first proposed stage. The Staging Report shall provide details of: (a) how the SSI would be staged, including general details of work activities associated with each stage and the general timing of when each stage would commence; and (b) details of the relevant conditions of approval, which would apply to each stage and how these shall be complied with across and between the stages of the SSI.	No Staging Report has been required, or lodged, to date. MTS does not propose Staging of any documentation or operational activities.

	Where staging of the SSI is proposed, these conditions of approval are only required to be complied with at the relevant time and to the extent that they are relevant to the specific stage(s). The Proponent shall ensure that an updated Staging Report (or advice that no changes to staging are proposed) is submitted to the Director General prior to the commencement of each stage, identifying any changes to the proposed staging or applicable conditions.	
B10	The Proponent shall ensure that all plans, sub-plans and other management documents required by the conditions of this approval and relevant to each stage (as identified in the Staging Report) are submitted to the Director General no later than one month prior to the commencement of the relevant stages, unless otherwise agreed by the Director General. Note: These conditions do not relate to staged infrastructure within the meaning of section 115ZD of the EP&A Act.	Noted.
B11	With the approval of the Director General, the Applicant may: (a) submit any strategy, plan, program (or the like) required by this approval on a progressive basis; and (b) combine any strategy, plan, program (or the like) required by this approval. Notes: While any strategy, plan or program may be submitted on a progressive basis, the Proponent will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times; and if the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.	MTS does not propose Staging of any documentation.
COMPLIANCE		
B12	The Proponent shall ensure that any strategy, plan, program (or the like) incorporates mitigation measures identified in the documents listed in condition 81, as relevant, and as modified by this approval.	OEMP Appendix A – Compliance Tables

B13	The Proponent shall ensure that employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	OEMP Section 6 Roles and Responsibilities.
B14	The Proponent shall be responsible for environmental impacts resulting from the actions of all persons that it invites onto the site, including contractors, sub-contractors and visitors.	OEMP Section 6.2 Training and Continuing Education OEMP Appendix A – Compliance Tables.
B15	In the event of a dispute between the Proponent and a public authority, in relation to an applicable requirement in this approval or relevant matter relating to the activity, either party may refer the matter to the Director General for resolution. The Director General's determination of any such dispute shall be final and binding on the parties.	Noted.
NOISE AND VIBRATION		
C5	The Rapid Transit Rail Facility is a stationary facility and shall be designed and operated with the objective of meeting operational noise levels derived from the NSW Industrial Noise Policy (INP) (NSW Government, 2000). Specific consideration shall be given to the following matters: i) the limiting of truck movements during night time periods (1Opm to 7am); ii) the design of the sheds and equipment for the train wash and wheel lathe facilities would include noise mitigation as required in order to comply with the acceptable noise criteria at the nearest noise sensitive receivers; iii) incorporation of silencers in the compressed air lines of the rolling stock to reduce noise associated with brake air release events; and iv) investigate methods to minimise rolling stock auxiliary noise levels during procurement.	OEMP. OEMP – Section 5 Environmental Aspects.

SOIL, WATER QUALITY AND HYDROLOGY		
C6	Except as may be provided by an EPL, the SSI shall be constructed and operated to comply with section 120 of the Protection of the Environment Operations Act 1997, which prohibits the pollution of waters.	OEMP Section 2.2 – Legal and Other Requirements. MTS EPL 21247
Water Quality Monitoring Program		
C10	A Water Quality Monitoring Program shall be prepared and implemented to monitor impacts on surface and groundwater quality resources and wetlands during construction and operation. The Program shall be developed in consultation with DPI (Fisheries), NOW and Blacktown City Council and shall include, but not be limited to: (a) identification of surface and groundwater quality monitoring locations which are representative of the potential extent of impacts from the SSI; (b) identification of the water quality parameters to be monitored at each location; (c) identification of works and activities during construction and operation of the SSI, including emergencies and spill events that have the potential to impact on surface water quality of potentially affected waterways; (d) presentation of parameters and standards against which any changes to water quality will be assessed, having regard to the principles of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC, 2000), and identification of 'trigger points' for further investigation for action to be taken; (e) representative background monitoring of surface and groundwater quality parameters, to establish baseline water conditions, unless otherwise agreed by the Director General; (f) identification of the frequency water sampling during background, and construction monitoring periods;	The D&C Contractor prepared a Water Quality Monitoring Program in accordance with the requirements of this condition, which was submitted to and approved by the then Director General of Planning (now DP&E) prior to the commencement of construction. Construction Soil and Water Management Plan for Sydney Metro Northwest Operations, Trains And Systems PPP

	(g) a minimum monitoring period of three years following the completion of the construction or until the affected waterways and/or groundwater resources are certified by an independent expert as being rehabilitated to an acceptable condition; (h) contingency and ameliorative measures in the event that adverse impacts to water quality relevant to the SSI are identified; and (i) reporting of the monitoring results to the Department, DPI, NOW and Blacktown City Council.	(NWRLOTS-NRT-PRD-PM-PLN-000852).
HAZARDS AND RISKS		
C16	Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with: (a) all relevant Australian Standards; (b) for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and (c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1 997). In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirement shall prevail to the extent of the inconsistency.	OEMP Section 5 Environmental Management and Monitoring. OEMP Section 7 – Incident and Emergency Response. Safety Management System. Spill Management Procedure. Rail Operating Manual (Hazardous Goods).
WASTE MANAGEMENT		
C17	All waste materials removed from the site shall only be directed to a waste management facility or premises lawfully permitted to accept the materials.	OEMP Section 5 – Environmental

		Management and Monitoring. OEMP Section 5 – Environmental Aspects.
C18	Waste generated outside the site shall not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the Protection of the *Environment Operations Act 1997*, if such a licence is required in relation to that waste.	OEMP Section 5 – Environmental Management and Monitoring. OEMP Section 5 – Environmental Aspects.
C19	All liquid and/or non-liquid waste generated on the site shall be assessed and classified in accordance with Waste Classification Guidelines (Department of Environment, Climate Change and Water, 2009), or any superseding document.	OEMP Section 5 – Environmental Management and Monitoring. OEMP Section 5 – Environmental Aspects.
DESIGN AND LANDSCAPING		
C23	The Proponent shall, prior to the commencement of permanent built works and/or landscaping, unless otherwise agreed by the Director General, prepare and implement and Design and Landscape Plan for the corresponding permanent built works and/or landscaping. The Plan shall be submitted to the Director General for approval and be made publicly available. In preparing the Plan, the Proponent shall consult with the Department (Land Release), RMS, relevant Councils and the community. The Plan shall be prepared by appropriately qualified person(s) and detail the design initiatives to integrate rail infrastructure and facilities into their existing and proposed settings, and landscaping measures to minimise, mitigate and/or	OEMP Section 5 Environmental Management and Monitoring

	offset the impacts of the SSI (including acoustic barriers and embankments/cuttings) on property and other land uses (such as open space), visual amenity and local vistas and heritage values. The Plan shall include, but not necessarily be limited to: (a) identification of design objectives and standards based on local environmental and heritage values, strategic and statutory planning, future land release form and function, sustainable design and maintenance, transport and land use integration, passenger and community safety and security, community amenity and privacy, and relevant design standards and guidelines; (b) details to provide, mitigate and/or augment landscaped areas and elements, with landscaping works to enhance ecological values, including riparian areas and fauna corridors, the provision of water sensitive urban design initiatives and measures to mitigate impacts to heritage landscapes; (c) design details of the built elements of the SSI, including retaining walls, embankments, noise barriers, and substations, and the measures to minimise the impact of these elements, particularly with respect to the impacts on adjoining residences, educational facilities, open space areas and heritage items and landscapes; (d) implementation, management and monitoring strategies to ensure the establishment and ongoing maintenance of built elements and landscaped areas, including performance standards; and (e) consideration of relevant design standards, such as the Susfarnable Design Guidelines for Sfaflons, Commuter Car Parks and Maintenance Facilities (2011), and Crime Prevention Through Environmental Design Principles, and relevant Agency and Council design standards. The Plan shall be endorsed by an independent Design Review Panel. The Design Review Panel shall consist of appropriately skilled professionals in the fields of architecture, landscape design, transport integration and heritage.	This has been closed for design.
SCHEDULE D		
COMPLIANGE MONITORING AND TRACKING		

Compliance Tracking Program		
D5	The Proponent shall develop and implement a Compliance Tracking Program to track compliance with the requirements of this approval. The Program shall be submitted to the Director General for approval prior to the commencement of construction and operate for a minimum of one year following commencement of operation. The Program shall include, but not necessarily be limited to: (a) provisions for the notification of the Director General prior to the commencement of construction of the SSI (including prior to each stage, where works are being staged); (b) provisions for periodic review of the compliance status of the SSI against the requirements of this approval; (c) provisions for periodic reporting of compliance status to the Director General, including a Pre-Construction Compliance Report, during construction reporting, and a Post-Construction Compliance Report; (d) a program for independent environmental auditing in accordance with ISO 19011:2003 - Guidelines for Quality and / or Environmental Management Systems Auditing; (e) mechanisms for recording environmental incidents during construction and actions taken in response to those incidents; (f) provisions for reporting environmental incidents to the Director General and relevant public authorities during construction; (g) procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management; and (h) provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	OEMP Section 8.6 – Compliance Tracking Program
Incident Reporting		

D6	The Proponent shall notify the Director General of any incident with significant off-site impacts on people or the biophysical environment within 48 hours of becoming aware of the incident. The Proponent shall provide full written details of the incident to the Director General within seven days of the date on which the incident occurred.	OEMP Section 7.3 – Incident Reporting.
D7	The Proponent shall meet the requirements of the Director General to address the cause or impact of any incident, as it relates to this approval, reported in accordance with condition D6 of this approval, within such period as the Director General may require.	OEMP Section 7.3 – Incident Reporting.
SCHEDULE F – OPERATIONAL ENVIRONMENTAL MANAGEMENT		
NOISE AND VIBRATION		
Operational noise and vibration criteria		
F1	Rail line components of the SSI shall be designed and operated with the objective of not exceeding the airborne and ground-borne noise trigger levels at existing development, at each stage of the SSI, as presented in the Rail Infrastructure Noise Guidelines (EPA, 2013).	OEMP Section 5 – Environmental Aspects. MTS Procurement Sourcing Procedure.
F2	Stationary components of the SSI shall be designed and operated with the objective of meeting operational noise levels derived from the NSt4/ Industrial Norse Policy (EPA, 20OO). Public announcement systems shall be designed and installed in accordance with best practice. Operational noise levels shall be reviewed within two years of commencement of operations and at any subsequent time as required by the Director General. The review shall have regard to the status of land use planning, any land use changes and the background noise environment within areas adjacent to the fixed facilities at the time of the relevant review. The Proponent shall submit the results of the review to the Director General. Any proposed changes to the operational noise levels as a result of the review shall be included in a revised ONVR.	OEMP Section 5 – Environmental Management and Monitoring OEMP Section 5 – Environmental Aspects. Operational noise levels review (TK920-04F01 Compliance with C22 F5

		and EPL R4.4 (r2)) was completed and submitted to DPIE Portal in Q3 2020. The report is included in Appendix F
F3	The SSI shall be designed and operated with the objective of not exceeding the vibration goals for human exposure for existing sensitive receivers, as presented in Assessing Vibration: a Technical Guideline (DECC, 2006).	OEMP Section 5 – Environmental Management and Monitoring OEMP Section 5 – Environmental Aspects. Operational Noise and Vibration Review.
F5	The Proponent shall undertake a noise and vibration compliance assessment to confirm the predictions of the noise assessment referred to in the ONVR (condition F4). The noise and vibration compliance assessment shall be developed in consultation with the EPA and be undertaken within twelve months of the commencement of operation of the SSI, or as otherwise agreed by the Director General. The assessment shall include, but not necessarily be limited to: (a) noise and vibration monitoring and compliance assessment, to assess compliance with conditions F1 to F3 of this approval and the ONVR; (b) methodology for assessment; (c) details of any complaints received relating to operational noise and vibration impacts; (d) any required recalibration of the noise and vibration model taking into account considerations such as land use change; (e) an assessment of the performance and effectiveness of the applied noise and vibration mitigation measures; and	OEMP Section 5 – Environmental Management and Monitoring OEMP Section 5 – Environmental Aspects. Operational noise levels review (TK920-04F01 Compliance with C22 F5 and EPL R4.4 (r2)) was completed and submitted to DPIE Portal

	(f) identification, if required, of further noise and vibration mitigation measures to meet the requirements of F1 to F3 of this approval and the objectives identified in the ONVR. A Noise and Vibration Compliance Assessment Report providing the results of the assessment shall be submitted to the Director General and the EPA within 60 days of its completion. If the assessment indicates an exceedance of the noise and vibration objectives identified in the ONVR, the Proponent shall implement further feasible and reasonable measures (where further reasonable and feasible measures (where required) to mitigate these exceedances in consultation with affected property owners.	in Q3 2020. The report is included in Appendix F
OPERATIONAL PERFORMANCE AUDIT REPORT		
F6	Within fifteen months of the operation of the SSI, or as otherwise agreed by the Director General, the Proponent shall commission an independent qualified person or team to undertake an Operational Performance Audit of the SSI. The independent person or team shall be approved by the Director General prior to the commencement of the Audit. The Operational Performance Audit Report shall be submitted to the Director General within one month of the completion of the Audit, unless otherwise agreed by the Director General. The Audit shall: (a) Assess compliance with the requirements of this approval, and other licences and approvals that apply to the SSI; (b) Assess the environmental performance of the SSI against the predictions made and conclusions drawn in the documents referred to under condition 81 of this approval; and (c) Review the effectiveness of the environmental management of the SSI, including any environmental impact mitigation works.	OEMP Section 8.2 – Auditing. The independent environment audit was conducted within 15 months
Operational Environmental Management		

F7	Prior to the commencement of operation, or as otherwise agreed by the Director General, the Proponent shall prepare and implement (following approval) an Operational Environmental Management Plan for the SSI. The Plan shall outline the environmental management practices and procedures that are to be followed during the operation, and shall be prepared in consultation with relevant agencies in accordance with the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources, 2004). The Plan shall include, but not be limited to: (a) a description of activities to be undertaken during operation of the SSI (including staging and scheduling); (b) statutory and other obligations that the Proponent is required to fulfil during operation, including approvals, consultations and agreements required from authorities and other stakeholders under key legislation and policies; (c) overall environmental policies, guidelines and principles to be applied to the operation of the SSI; (d) a description of the roles and responsibilities for relevant employees involved in the operation of the SSI, including relevant training and induction provisions for ensuring that employees are aware of their environmental and compliance obligations under these conditions of approval; (e) an environmental risk analysis to identify key environmental performance issues associated with the operation phase; and (f) details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions will be undertaken to address identified potential adverse environmental impacts, including those safeguards and mitigation measures detailed in the documents listed under condition B1 (and any impacts arising from the staging of the construction of the SSI). In particular, the following environmental performance issues shall be addressed in the Plan: (x) Surface Water, Groundwater and Flooding; (xi) Groundwater; (xii) Traffic and Transport; (xiii) Noise and Vibration; (xiv) Visual Amenity; (xv) Vegetation; (xvi) Heritage; (xvii) Soil and Contamination; (xviii) Air Quality;	This OEMP.

	(xix) Waste and Resource Management; and (xx) Climate Change and Energy Use.	

TABLE A4: SSI-5931 REVISED ENVIRONMENTAL MITIGATION MEASURES

REQ'T	DESCRIPTION	DOCUMENT REFERENCE
SOILS AND CONTAMINATION		
OpSG2	Procedures to quickly address any contaminant spill or accident would be developed and implemented during operation of the station sites.	OEMP; Environmental Aspects Maps; Info Docs, including; Contamination Reports from D&C Phase, including clearance certificates. Spill Management Procedure; Unexpected finds procedure.

OpE2	Noxious and environmental weeds would be controlled within the site boundary	OEMP (weed management); Environmental Aspects Maps; Rail Operating Manuals.
TRAFFIC AND TRANSPORT		
OpT6	Consideration of peak period movements in assigning shift hours and changeover patterns for maintenance staff at the RTRF. Ideally these should be undertaken outside identified peak periods, noting that some staff may be constrained by rail operations.	Green Travel Plan; Provision of adequate parking at SMTF (office and maintenance sites); Provision of significant parking facilities at stations.
OpT7	Preparation of workplace travel plans for RTRF entities that would provide alternative modes for journeys to/from work. The proximity of the future Cudgegong Road Station (Tallawong Station) provides a significant opportunity to contribute towards a higher public transport mode share for RTRF staff journeys. The potential for RTRF staff shuttle services between the site and Cudgegong Road Station (Tallawong Station) should be considered as part of this workplace travel plan	Green Travel Plan; Provision of adequate parking at SMTF (office and maintenance sites); Provision of significant parking facilities at stations.
NOISE AND VIBRATION		
OpNV8	The implementation of feasible and reasonable noise and vibration mitigation measures such as: - The design of the sheds and equipment for the train wash and wheel lathe facilities would include noise mitigation as required in order to comply with the applicable noise criteria at the nearest noise sensitive receivers.	OEMP Section 5 – Environmental Aspects; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and

		Noise and Vibration Monitoring Procedure.
OpNV9	The implementation of feasible and reasonable noise and vibration mitigation measures such as: - Investigate the option to incorporate silencers in the compressed air lines of the rolling stock to reduce noise associated with brake air release events.	OEMP Section 5 – Environmental Aspects; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure
OpNV10	The implementation of feasible and reasonable noise and vibration mitigation measures such as: - Investigate methods to minimise rollingstock auxiliary noise levels during procurement.	OEMP Section 5 – Environmental Aspects; Environmental Aspects Maps; Operational Noise and Vibration Compliance Assessment; and Noise and Vibration Monitoring Procedure
SURFACE WATER AND FLOODING		
OpSW4	Treatment measures would be applied to water collected in onsite detention basins, including settling of coarse sediments, the use of flocculation for finer sediments and pH correction.	OEMP; Environmental Aspects Maps. Water Monitoring Procedure; Environment Protection Licence; Trade Waste Licence;

		Works Approval Protocol; Emergency and Incident Response Framework; and Discharge Procedure.
OpSW16	A surface water quality monitoring program would be developed post construction to monitor water quality upstream and downstream of the works. Monitoring procedures and performance criteria would be established in consultation with local councils and relevant government agencies.	See response to C10; OEMP Section 5 Monitoring; MTS Water Monitoring Program; Environment Protection Licence; Works Approval Protocol; Emergency and Incident Response Framework; and Discharge Procedure.
NON-INDIGENOUS HERITAGE		
OpEh1	Maintain the vegetation retained, reinstated and planted during the construction phase.	OEMP; Environmental Aspects Maps; Unexpected finds procedure; Inspections of landscape areas under the Asset Information System and Station Operations Manual (ROM).

ECOLOGY		
OpE2	Noxious and environmental weeds would be controlled within the site boundary	Weed Management Procedure; Environmental Aspects Maps; Rail Operating Manuals.
VISUAL AMENITY		
OpV2	Cut–off and directed lighting would be used to ensure glare and light spill on surrounding existing and future residents are minimised.	Urban Design and Landscape Plan; Inspections regarding the public area and rail corridor cleanliness, condition and graffiti, under the Asset Information System and Station Operations Manual (ROM).
CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS		
OpGHG1	The RTRF would minimise GHG emissions through energy reduction and avoidance, energy efficiency and onsite and offsite renewable or low carbon energy in accordance with the NWRL Environment and Sustainability Policy.	OEMP Section 5 – Environmental Aspects; and Sustainability Ratings (ISCA, Green Building, TfNSW Sustainable Design Guidelines.
OpGHG5	The RTRF would source at least 10%of the annual operational energy demand at the site (not including that required for traction) from on site renewable or low carbon sources.	OEMP Section 5 – Environmental Aspects; and Sustainability Ratings (ISCA, Green Building, TfNSW Sustainable Design Guidelines.
AIR QUALITY		

OpA1	Develop an OEMP including an Air Quality section, which would include consideration of areas on The site to be maintained in a condition to minimise erosion (water and wind erosion). This may include vegetation, gravel surfacing, or paving of heavily trafficked areas.	OEMP; Operational Maintenance Plan; Plan Maintenance Schedule; Rail Operating Manuals.
OpA3	Dedicated painting, degreasing, cutting, grinding, welding and similar such areas to be fitted with effective fume extraction systems to protect workers adequately, and if necessary filtration to ensure that no excessive impacts occur at nearby receptors.	OEMP; Operational Maintenance Plan; Plan Maintenance Schedule; Rail Operating Manuals.
OpA3	Where possible, activities where large quantities of solvents or air pollutants may be released near the site boundary and upwind of a receptor should be avoided or postponed to a more suitable period of weather. Where possible, low VOC solvents should be used, in the minimal quantify necessary to be effective.	OEMP; Operational Maintenance Plan; Work Method Statements; Plan Maintenance Schedule; Rail Operating Manuals
WASTE MANAGEMENT		
OpW1	Develop and OEMP including a section on Operational Waste and Resource Recovery Management. This would detail opportunities for avoiding waste generation and responsible disposal methods for different waste streams.	OEMP Section 5 – Environmental Aspects; Waste Management Procedure;

		Waste Dockets; Rail Operating Manuals.
HAZARDOUS GOODS		
OpDG1	All dangerous good stored at the site would be below the screening thresholds set out tin Applying SEPP 33 for potentially hazardous development.	Rail Operating Manuals.

ECRL REF – Division 4, PART 5, EP&A Act

Table A5 below has been prepared by exception, and only contains the Conditions of Approval as applicable to the Operation Phase of the NRT Project. Conditions relating to the Design and Construct (D&C) Phase of the Project are to be closed out with the relevant authorities by TfNSW (Sydney Metro) and the D&C contractor(s) prior to the handover for Operation Phase and the commencement of this Operational Environmental Management Plan (OEMP).

TABLE A5: ECRL CoA

REQ'T	DESCRIPTION	DOCUMENT REFERENCE
Operational Noise and Vibration		
19	The mechanical and electrical plan and ventilation systems shall be designed and operated so as not to exceed project specific noise levels derived in accordance with the *NSW Industrial Noise Policy* (DECCW 2000) and acceptable vibration levels specified in *Assessment Vibration: A Technical Guideline* (DEC 2006).	OEMP Section 5 – Environmental Management and Monitoring; OEMP Section 5 – Environmental Aspects and Appendix E;

		Operational Noise and Vibration Review.
Operational Noise Compliance Monitoring		
20(a)	Compliance monitoring shall be undertaken within 3 months of the commissioning of the mechanical and electrical plant and ventilation systems to evaluate the effectiveness of the operational noise and vibration mitigation measures to determine if any additional reasonable and feasible mitigation measures are needed that are consistent with the requirements of the *Industrial Noise Policy* (EPA2000).	OEMP Section 5 – Environmental Management and Monitoring; OEMP Section 5 – Environmental Aspects; Operational Noise and Vibration Review (ECRL Renzo Tonin August 2017).
20(b)	In the event that the compliance monitoring indicates that the operation of the Project, will lead to greater noise impacts than previously modelled, additional noise mitigation measures would be developed in consultation with relevant stakeholders and the affected receivers.	OEMP Section 5 – Environmental Management and Monitoring; OEMP Section 5 – Environmental Aspects and Appendix E; Operational Noise and Vibration Review (ECRL Renzo Tonin August 2017).
Sustainable Development		
36. Greenhouse Gas Emissions		
(b)	The greenhouse gas emissions of the Project shall be incorporated into any carbon foot-printing and subsequent reduction strategies for the NWRL Project.	OEMP Section 5 – Environmental Aspects
(c)	Energy efficiency measures shall be incorporated into the design and operation of the Project.	OEMP Section 5 – Environmental Aspects

Appendix B.Definition Table

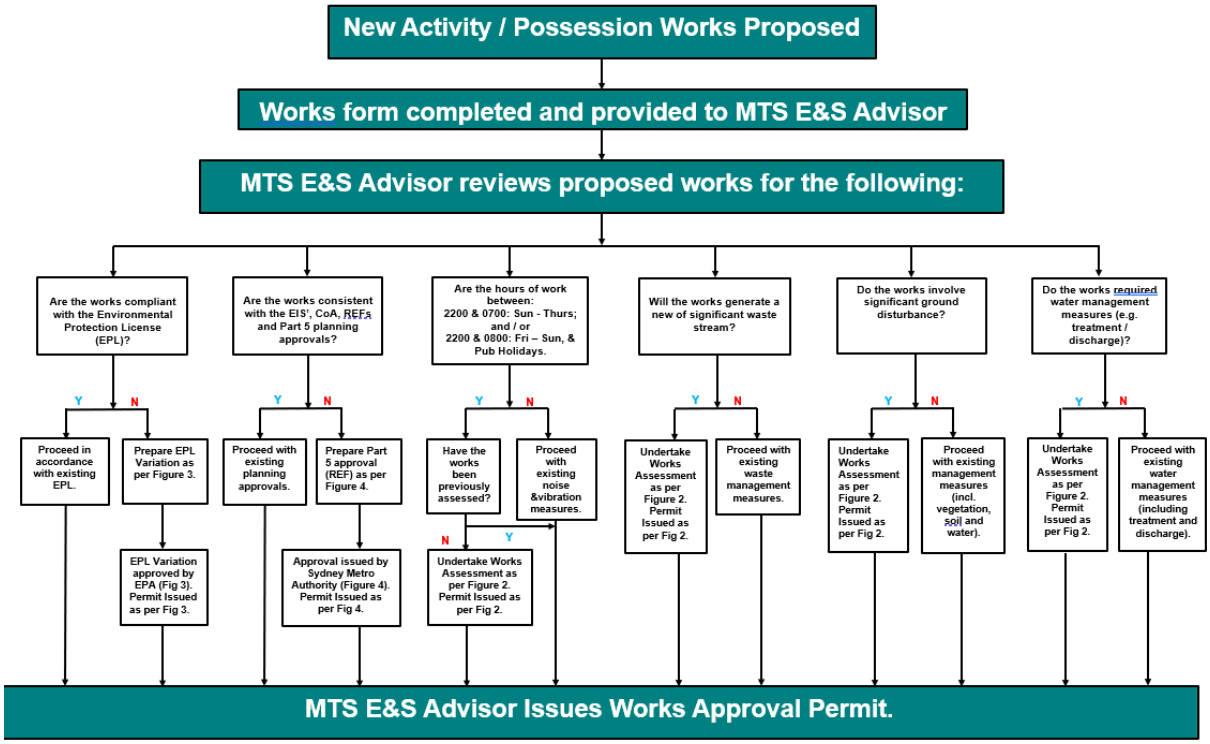
Abbreviation	Title
AMA	Additional Maintained Areas
ANZECC	Australia and New Zealand Environment and Conservation Council
AS	Australian Standard
CEO	Chief Executive Officer
CoA	Conditions of Approval
CRM	Customer Relationship Management
CTP	Compliance Tracking Program
D&C	Design & Construction
D&D	Design & Delivery
D&DJV	Design & Delivery Joint Venture
DP&E	NSW Department of Planning & Environment
E&S	Environment & Sustainability
EAM	Environmental Aspect Map
ECRL	Epping to Chatswood Rail Line
ECSM	Electricity Consumption Software Model
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EP&A	Environmental Planning & Assessment
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
GM	General Manager
HR	Human Resources
HSEQ	Health, Safety, Environment and Quality
IMF	Incident Management Framework
IMS	Integrated Management System
ISO	International Standards Organisation
LMA	Licenced Maintenance Areas
MCoA	Ministerial Conditions of Approval

MTS	Metro Trains Sydney Pty Ltd
NOW	NSW Office of Water
NRT	Northwest Rapid Transit
NWRL	Northwest Rail Link
O&M	Operation & Maintenance
OEH	NSW Office of Environment & Heritage
OEMP	Operational Environmental Management Plan
ONVR	Operational Noise and Vibration Review
OpCo	Operating Company
OTS	Operations, Trains & Systems
PAS	Public Announcement System
PIRMP	Pollution Incident Response Management Plan
PMS	Project Management System
POEA Act	Protection of the Environment Operations Act 1997
PPP	Public Private Partnership
PRL	Parramatta Rail Link
PV	Photo Voltaic
RECS	Renewable Energy Certificates
REMMs	Revised Environmental Mitigation Measures
ROMs	Rail Operating Manuals
RTRF	Rapid Transit Rail Facility
SCIP	Stakeholder & Community Involvement Plan
SH&E	Safety, Health & Environment
SQRE	Safety, Quality, Risk & Environment
SMA	Sydney Metro Authority (an independent agency of TfNSW)
SMTF	Sydney Metro Train Facility
SSI	State Significant Infrastructure
TfNSW	Transport for NSW
VOC	Volatile Organic Compound
WAP	Works Approval Protocol

Appendix C.Risk Assessment

Risk Number	RISK EVENT	CATEGORY	CAUSES	CONSEQUENCES	CONTROLS/TREATMENTS	CONSEQUENCE LEVEL	LIKELIHOOD	RISK RATING
	Threat and/or Opportunity Description	Project Category	Cause/s (How and why it can happen)	Impact of Threat/Opportunity on Project	Name / Description	Consequence Level	Likelihood Level	Risk Rating
				Noise and Vibration				
1	Excessive noise from surface repair or maintenance works.	Surface Works	Repair and maintenance works (including tamping, ballast cleaning, etc) are undertaken without: - proper notification to the community; - implementation of mitigation measures.	- Public complaint; - Infringement notice from regulators; - Loss of reputation; - EPA applies stricter requirements to Maintenance & Repair works through the EPL (potentially restricting operating hours).	- Modelling to be conducted to identify possible sensitive receivers, measures to be put in place to mitigate. - Community notification of maintenance and repair works to be undertaken in accordance with EPL provisions and Deed requirements; - Mitigation measures to be implemented, including respite, as determined through noise assessment. - Implementation of OEMP, Operational Noise and Vibration Management Plan (Sub-Plan) and Maintenance & Repair Works Environmental Approval Protocol.	4	2	Moderate
2	Vibration from maintenance works within close proximity to receivers.	Surface Works	Repair and maintenance works (including tamping, ballast cleaning, etc) are undertaken without: - proper notification to the community; - implementation of mitigation measures.	- Public complaint; - Cosmetic damage; - Structural damage; - Infringement notice from regulators; - Loss of reputation; - EPA applies stricter requirements to Maintenance & Repair works through the EPL (potentially restricting operating hours).	- Modelling to be conducted to identify possible sensitive receivers, measures to be put in place to mitigate. - Community notification of repair and maintenance works to be undertaken in accordance with EPL provisions and Deed requirements; - Mitigation measures to be implemented, including respite, as determined by vibration assessment - Greater separation of vibratory works were possible - Implementation of Operational Noise and Vibration Management Plan (Sub-Plan) and Maintenance & Repair Works Environmental Approval Protocol	3	1	Low
3	Groundborne Noise is greater than the Operational Noise and Vibration models predicted (ONVR).	Tunnel Operation	- Modelling used during D&C Phase had incorrect inputs; - The "as built" Project did not meet the design requirements for regenerated noise - The operation of the railway systems are not as envisaged during design development	- Public complaint; - Infringement notice from regulators; - Breach of the MCoA leading to fines or stop works order from DP&E; - Loss of reputation; - EPA applies stricter requirements to the operation of the Project; - Requirement to undertake major works to reconstruct the Project to the required standards.	-Performance criteria established in ROMs -Operations undertaken in compliance with ROMs - Noise and Vibration Complaince Assessment sampling and report	4	1	Low
4	Noise and vibration impacts to sensitive receivers from the operation of the RTRF.	RTRF	-Operational activities undertaken outside of Maintenance Facility during the evening and night-time periods -Wheel lathe use during the night-time period -Train horns used during general operations -Heavy vehicles operating during the night-time period - Maintenance & Repair activities undertaken within facility	- Public complaint; - Impacts to human comfort - Cosmetic damage (vibration); - Structural damage (vibration); - Infringement notice from regulators; - Loss of reputation; - EPA applies stricter requirements to OOHs works through the EPL (potentially restricting operating hours).	- Land use inputs / updates into models to identify sensitive receivers - Modelling to be conducted to identify noise levels, measures to be put in place to mitigate - Community notification of maintenancand repair works to be undertaken in accordance with EPL provisions and Deed requirements; - Mitigation measures to be implemented, including respite, as required determined by modelling - Implementation of OEMP, Operational Noise and Vibration Management Plan (Sub-Plan) and Maintenance & Repair Works Environmental Approval Protocol	4	2	Moderate
				Soil and Water				
5	Contamination of water through spills of fuels or chemicals.	All Works.	-Plant & equipment failure -Accidental spill -Inappropriate storage -Unapproved release of impacted water -Refuelling not appropriately controlled -Spill kit not available	- Pollution of watercourse and stormwater; - Infringement notice; - Reputational damage; - Clean up costs.	-OEMP - Refuelling Procedures; - Spill Management Procedure; - Provision of Spill Kits at set locations, and mobile spill kits for sites outside of the RTRF; - Training of all staff and workforce; - Incident Response Procedures; - Detention Basin Management Procedure; and - Water quality and watercourse monitoring.	4	3	Moderate
6	Utility strike (water or sewer) during repair or maintenance works causes a release of water to the surrounding environment.	Surface Works	- Accidental strike of service as located on plan; - Utility is marked on plans in the wrong location; or - Service not formerly identified by any means of investigation discovered and damaged.	- Pollution of watercourse and stormwater; - Disruption to service provision; - Infringement notice; - Reputational damage; - Clean up costs.	- OEMP - Excavation permit system to be implemented - Spill Management Procedure; - Provision of Spill Kits at set locations, and mobile spill kits for sites outside of the RTRF; - Training of all staff and workforce; - Incident Response Procedures.	2	1	Very Low
7	Unforseen water inflows into the tunnel require additional discharge	Environment and Sustainability	- Settlement and/or damage to tunnel causing additional groundwater inflow - Damaged water service draining to tunnel	- Delay as WTP operation is amended to allow for increased discharge - Infringement notice from EPA for discharge of water(s) in contravention of the EPL - Stop train operations (depending on volume entering tunnel).	- Settlement monitoring previously undertaken - Work method planning takes into consideration existing services - CCS monitoring performance of pumps and WTP	5	1	Moderate
8	Impacts to water quality from discharge of treated groundwater.	Environment and Sustainability	- WTP failure - CCS monitorin not identifying water quality impact - Unathorised descharge	- Pollution of watercourse and stormwater; - Impacts to aquatic flora and fauna; - Infringement notice; - Reputational damage; - Clean up costs.	- OEMP; - Refuelling Procedures; - Spill Management Procedure; - Provision of Spill Kits at set locations, and mobile spill kits for sites outside of the RTRF; - Training of all staff and workforce; - Incident Response Procedures; - Detention Basin Management Procedure; and - Water quality and watercourse monitoring.	4	3	Moderate
9	Pollution of watercourses from discharge of sediment laden or otherwise contaminated stormwater runoff.	Environment and Sustainability	- Failure of RTRF retention basin; - Rainfall event larger than the design capacity of the permanent built drainage facilities.	- Pollution of watercourse and stormwater; - Impacts to aquatic flora and fauna; - Infringement notice; - Reputational damage; - Clean up costs	- OEMP; - Refuelling Procedures; - Spill Management Procedure; - Provision of Spill Kits - Training of relevant staff and workforce; - Incident Response Procedures; - Detention Basin Management Procedure; and - Water quality and watercourse monitoring.	4	1	Low
10	Ongoing water table drawdown, settlement / ground movement, bed cracking / surface flow loss from previous tunnelling activities & excavations.	Tunnel	- Ongoing settlement of ground and inflows around the project infrastructure	- Flooding of infrastructure assets - Impact to natural flow and GDEs	- Previous settlement monitoring - Site inspection - Watercourse inspections	4	1	Low
11	Impacts from flood risk to stations and other rail infrastructure.	Environment and Sustainability	- Rainfall events beyond the design capacity of the final built infrastructure.	- Flooding of stations and other assets; - Damage to infrastructure; - Impacts on operations; - Risk to human safety and life;	- Previous flood assessments - Prevent impacts on drainage systems and watercourses through work planning - Temporary flooding controls / diversions	4	1	Low

Appendix D. Works Approval Protocol



Appendix E. Noise & Vibration Assessment criteria and Assumptions

In this Appendix is a series of tables that include the noise and vibration criteria, and associated assumptions, developed during the preparation of the ONVRs. These criteria and assumptions will be utilised:

As the benchmark for noise and vibration monitoring for the Noise and Vibration Compliance Assessments required under the MCoA (Table 10);

To assess compliance of the actual noise levels of the operational network against the predictions contained in the ONVRs.

Criteria and Assumptions – SSI-5414

A.1 Ground Bourne Noise and Vibration

The assessment of GBNV was based on the following assumptions, which will also need to be considered by MTS when undertaking the compliance assessment. Modelling inputs included:

- 8-car train sets, to be conservative and allow for increase in services at a later date;

- Track Type II – Delkor Egg (Type RF167) rail fasteners which have reduced stiffness (including a rubber layer in between the plates) to attenuate vibration;
- Track Type III – Floating Slab Track (FST) to be utilised in areas where GBNV levels were predicted to be above design objectives for Track Type II. FST sits on 300mm wide rubber strip bearings placed between each pair of rail fasteners (Delkor Alt 1).
- GBNV predictions include and allowance of 5dB(A) to account for variations in wheel condition.
- At locations where there are turnouts (cross-overs) within the tunnels (near Epping and Castle Hill Stations) an allowance of 10dB(A) over a track length of 10 metres has been included to address increased GBNV in these areas.
- Train speeds have been allowed for as 100 km/hr for the whole tunnel alignment except on the approaches and departures from stations.

Figure below (extract from ONVR SSI-5414, Renzo Tonin) illustrates the train speeds used in the modelling.

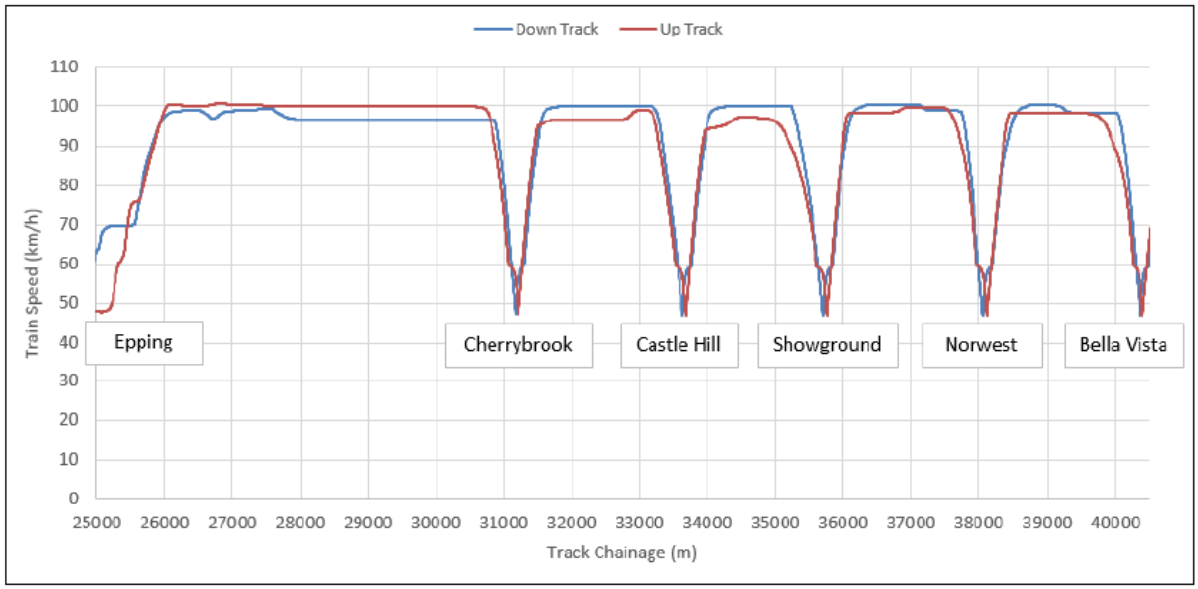


Table 20: Ground-Bourne (Internal) Noise Objectives

(Extract: Table 3-1 of ONVR SSI-5414 (Renzo Tonin))

SENSITIVE LAND USE	TIME OF DAY	NOISE TRIGGER LEVELS DB(A)	SOURCE
Residential1	Day (0700 – 2200)	40 LAmax (slow), 95%	IGANRIP
	Night (2200 – 0700)	35 LAmax (slow), 95%	IGANRIP
Schools, Educational Institutions and Places of Worship2	When in use.	40 – 45 LAmax (slow), 95%	IGANRIP

Offices	When in use.	45 LAmax (slow), 95%	SPR Appendix 44
Cinemas	When in use.	35 LAmax (slow), 95%	SPR Appendix 44
Public Halls	When in use.	40 LAmax (slow), 95%	SPR Appendix 44
Lecture Theatres	When in use.	40 LAmax (slow), 95%	SPR Appendix 44
Film / TV Studios	When in use.	NR15 (refer AS/NZS 2107:2000)	SPR Appendix 44
Other Critical Spaces	When in use.	Satisfactory Levels in AS/NZS 2107:2000)	SPR Appendix 44
Note 1: Receiver type HOS (hospital) is conservatively assumed to have ground-borne noise objectives consistent with residential receivers. This does not include animal hospitals or veterinaries which are assumed to be retail premises. Note 2: Receiver type CHC (child care) is assumed to have ground-borne noise objectives consistent with schools and educational facilities. Note 3: Receiver types IND (industrial) and RET (retail) are not considered to be sensitive to ground-borne noise (therefore not included).			

Table 21: Ground-Bourne Vibration Objectives

(Extract: Table 3-2 of ONVR SSI-5414 (Renzo Tonin))

LOCATION	ASSESSMENT PERIOD	PREFERRED VALUES		SOURCE
		Z-AXIS	Z-AXIS AND Y-AXIS	
Continuous Vibration (Weighted RMS acceleration[3], m/s², 1-80Hz)				
Critical Areas2	Daytime or Night-Time	0.005 (74dB)	0.0036 (71dB)	Assessing Vibration Guideline
Residences	Daytime	0.010 (80dB)	0.0071 (77dB)	Assessing Vibration Guideline
	Night-Time	0.007 (77dB)	0.005 (74dB)	Assessing Vibration Guideline
Offices, Schools, Educational Institutions and Places of Worship	Daytime or Night-Time	0.020 (86dB)	0.014(83dB)	Assessing Vibration Guideline
Workshops	Daytime or Night-Time	0.040 (92dB)	0.029 (89dB)	Assessing Vibration Guideline

Cinemas	When in use.	0.020 (86dB)	0.014 (83dB)	SPR Appendix 44
Public Halls	When in use.	0.020 (86dB)	0.014 (83dB)	SPR Appendix 44
Lecture Theatres	When in use.	0.020 (86dB)	0.014 (83dB)	SPR Appendix 44
Film / TV Studios	When in use.	0.020 (86dB)	0.014 (83dB)	SPR Appendix 44
Other Critical Spaces	Generic Vibration Criterion (VC) curves in Institute of Environmental Sciences and Technology (IEST) Industry Standard IEST-RP-CC012 considerations in Clean Room Design (2007)	SPR Appendix 44		
Note 1: Daytime is 0700 to 2200 and night-time is 2200 to 0700. Note 2: Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. These criteria are only indicative, and there may be a need to assess intermittent values against the continuous or impulsive criteria for critical areas. (Source: BS 6472-1992). Note 3: Weighted RMS acceleration values determined in accordance with Assessing Vibration: a technical guide[6].				

Airborne Noise and Vibration

Table 22: Airborne Rail Traffic Noise Trigger Levels for Residential Land Uses

(Extract: Table 4-1 of ONVR SSI-5414 (Renzo Tonin))

TYPE OF DEVELOPMENT	NOISE TRIGGER LEVELS (DB(A)1		
	DAY (0700 TO 2200)	NIGHT (2200 TO 0700)	COMMENT
New Rail Line Development	Resulting rail noise levels exceeded:		These numbers represent external levels of noise that trigger the need for an assessment of the potential noise impacts from a rail infrastructure project.
	60 LAeq(15h) 80 LAmax	55 LAeq(9h) 80 LAmax	
Note 1: As Sydney Metro Northwest represents a new rail line development, the noise increase trigger levels (applicable only to rail upgrade projects) are not shown.			

Table 23: Airborne Rail Traffic Noise Trigger Levels for Non-Residential Sensitive Land Uses

(Extract: Table 4-2 of ONVR SSI-5414 (Renzo Tonin))

SENSITIVE LAND USES	NOISE TRIGGER LEVELS DB(A)
	NEW RAIL LINE DEVELOPMENT
Schools, Educational Institutions – Internal	40 LAeq(1hr)
Places of Worship – Internal	40 LAeq(1hr)
Hospitals – External	60 LAeq(1hr)
Hospitals – Internal	35 LAeq(1hr)
Passive Recreation – External	LAeq as per residential noise level values in Table 1 (does not include maximum noise level component).
Active Recreation (e.g. gold course)	65 LAeq(24hr)

Table 24: Types of Vibration (Source: Assessing Vibration: A Technical Guideline)

(Extract: Table 4-3 of ONVR SSI-5414 (Renzo Tonin))

TYPE OF VIBRATION	DEFINITION	EXAMPLES
Continuous Vibration	Continues uninterrupted for a defined period (usually throughout the day-time and/or night-time).	Machinery, steady road traffic, continuous construction activity (such as tunnel boring machinery).
Impulsive Vibration	A rapid build-up to a peak followed by a damped decay that may or may not involve several cycles of vibration (depending on frequency and damping). It can also consist of a sudden application of several cycles at approximately the same amplitude, providing that the duration is short, typically less than 2 seconds.	Infrequent: Activities that create up to 3 distinct vibration events in an assessment period, e.g. occasional dropping of heavy equipment, occasional loading and unloading.
Intermittent Vibration	Can be defined as interrupted periods of continuous or repeated periods of impulsive vibration that varies significantly in magnitude.	Trains, nearby intermittent construction activity, passing heavy vehicles, forging machines, impact pile driving, jack hammers. Where the number of vibration events in an assessment period is three or fewer, this would be assessed against impulsive vibration criteria.

Table 25: Acceptable Vibration Values for Intermittent Values Vibration ($m/s^{1.75}$)

(Extract: Table 4-4 of ONVR SSI-5414 (Renzo Tonin))

LOCATION	DAYTIME1		NIGHT-TIME1	
	PREFERRED VALUE	MAXIMUM VALUE	PREFERRED VALUE	MAXIMUM VALUE
Critical Areas2	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.013	0.26
Offices, Schools, Educational Institutions and Places of Worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.30
Note 1: Daytime is 7:00am to 10:00pm and night-time is 10:00pm to 7:00am Note 2: Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. These criteria are only indicative, and there may be a need to assess intermittent values against the continuous of impulsive criteria for critical areas. (Source: BS 6472-1992).				

Table 26: GBN Trigger Levels

(Extract: Table 4-5 of ONVR SSI-5414 (Renzo Tonin))

RECEIVER	TIME OF DAY	GBN TRIGGER LEVEL (DB(A))
Residential	Day (07000 to 2200)	40 $L_{Amax(slow)}$
Residential	Night (2200 to 0700)	35 $L_{Amax(slow)}$
Schools, Educational Institutions, Places of Worship	When in use.	40 – 45 $L_{Amax(slow)}$

Table 27 and Table 28 below outline the assumptions made in the ONVR relating to train movements and rolling stock which was applied in the Noise and Vibration Assessment undertaken 12 months after the commencement of operation.

Table 27: Rail Traffic Movements (6-car trains)

(Extract: Table 4-7 of ONVR SSI-5414 (Renzo Tonin))

SCENARIO	TRAINS PER WEEKDAY PERIOD				
	DAYTIME 0700 TO 2200		NIGHT-TIME 2200 TO 0700		TOTAL 24 HOUR
	UP	DOWN	UP	DOWN	
Opening 4 min headways during peak periods – 10 minute headways off-peak periods.	131	141	41	31	344
Future Scenario 2.4 min headways during peak periods – 10 minute headways off-peak periods.	180	199	50	31	460
Note: Train numbers are based on the proposed Monday to Thursday timetable and represent the number of train movements at Kellyville Station.					

Table 28: Reference Noise Levels for Airborne Noise Modelling (6-car trains)

(Extract: Table 4-8 of ONVR SSI-5414 (Renzo Tonin))

TRAIN TYPE	TRACK FORM	REFERENCE CONDITIONS	$L_{AEmax,\ 95\%}$	LAE_1
Alstom Metropolis	Ballasted Track	15m, 80km/hr	84.5	87.2
	Slab Track Without Rail Dampeners (only near elevated stations).	15m, 80km/hr	89.4	92.0
	Slab track with rail dampeners and four-foot panels (all sections of viaduct between stations).	15m, 80km/hr	85.9	88.6
Note: Calculated noise level for 6 car train on the basis of the $L_{pAeq,Tp}$ noise levels and the passby time.				

B Criteria and Assumptions – SSI-5931

B.1 Long-Terms Noise Monitoring Results

Table 29: Long-Term Noise Monitoring

(Extract: Table 2-3 of ONVR SSI-5391 (Renzo Tonin))

NCA	NOISE MONITORING LOCATION	RATING BACKGROUND LEVEL (RBL) L_{A90}				L_{AEQ} AMBIENT NOISE LEVELS		
		SHOULDER	DAY	EVE	NIGHT	DAY	EVE	NIGHT
RTF-01	M_RTF01 88 Amarco Cct, The Ponds	38	43	44	32	58	56	51
RTF-02	BG25 43 Schofields Road, Rouse Hill	37	43	44	30	53	54	58
RTF-03	M_RTF03 67 Tallawong Road, Rouse Hill	33	33	33	33	52	47	45
RTF-04	M_RTF03 67 Tallawong Road, Rouse Hill	33	33	33	33	52	47	45

Note 1: Day: 07:00-18:00 Monday to Saturday and 08:00-18:00 Sundays & Public Holidays

Evening: 18:00-22:00 Monday to Sunday & Public Holidays

Night: 22:00-07:00 Monday to Saturday and 22:00-08:00 Sundays & Public Holidays

Note 2: Shoulder: a 'Shoulder' period has been established for 05:00-07:00. The shoulder period rating background level is taken to be the mid-point between the rating background levels between the two assessment periods that are on either side of the shoulder period.

Note 3: As required by the INP, the external ambient noise levels presented are free-field noise levels. [ie. no façade reflection]

Note 4: Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5m above ground level. If the property boundary is more than 30m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

B.2 SMTF Noise and Vibration Criteria

Table 30: SMTF Operational Noise Targets (dB(A))

(Extract: Table 3-2 of ONVR SSI-5391 (Renzo Tonin))

NCA	LOCATION	INTRUSIVE NOISE CRITERIA LAeq (15 min)			AMENITY NOISE CRITERIA LAeq (period)			SLEEP DISTURBANCE		
		SHDR	DAY	EVE	NIGHT	SHDR	DAY	EVE	NIGHT	$L_{A1\ (1\ min)}$
RTF-01	South of Schofields Rd, between Cudgegong Rd and east of Boundary Rd.	43	48	48	37	45	55	45	40	47
RTF-02	West of SMTF, between Schofields Rd and Gordon Rd.	42	48	48	35	45	55	45	40	45
RTF-03	North of SMTF, west of Tallawong Rd and north of Gordon Rd.	38	38	38	38	45	55	45	40	48
RTF-04	North of SMTF, between Tallawong Rd and Cudgegong Rd.	38	38	38	38	45	55	45	40	48
RTFO-01	Lankarama Buddhist Temple	40 (internal) when in use.								

Note 1: Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5m above ground level. If the property boundary is more than 30m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence, except where otherwise noted. Noise levels may be higher at upper floors of the noise affected residence.

Note 2: Shldr: a 'Shoulder' period has been established for 05:00-07:00 Monday to Saturday and 05:00-08:00 Sundays & Public Holidays

Day: 07:00-18:00 Monday to Saturday and 08:00-18:00 Sundays & Public Holidays

Evening: 18:00-22:00 Monday to Sunday & Public Holidays

Night: 22:00-05:00 Monday to Sundays & Public Holidays

Note 3: Where the Evening (or night) RBL is greater than Day RBL, Evening NML is based on Day NML, in accordance with INP guidelines.

Table 31: Preferred / Maximum Weighted RMS Values

(Extract: Table 3-3 of ONVR SSI-5391 (Renzo Tonin))

LOCATION	ASSESSMENT PERIOD1	PREFERRED VALUES		MAXIMUM VALUES	
		Z-AXIS	X AND Y AXIS	Z-AXIS	X AND Y AXIS
Critical Areas[2]	Daytime or Night-time	0.005	0.0036	0.010	0.0072
Residences	Daytime	0.010	0.0072	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, Schools, Educational Institutions and Places of Worship	Daytime or Night-time	0.020	0.014	0.040	0.028
Workshops	Daytime or Night-time	0.04	0.029	0.080	0.058

Note 1: Daytime is 7.00 am to 10.00 pm and night-time is 10.00pm to 7.00 am

Note 2: Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. There may be cases where sensitive equipment or delicate tasks require more stringent criteria than the human comfort criteria specify above. Stipulation of such criteria is outside the scope of their policy and other guidance documents (e.g. relevant standards) should be referred to. Source: BS 6472-1992 [17]

B.3 SMTF Modelling Assumptions

The assumptions below, developed during the preparation of the ONVR for the SMTF will be considered and integrated, where appropriate, into the operations Noise and Vibration Assessment required to be undertaken within 15 months of the commencement of operation of the SMTS, as required under MCoA F6.

- Stabling yard:
  - Stable up to 37 six-car train sets
  - While stabled at the yard, pantographs will be lowered and trains powered down.
  - Prior to trains departing for service, trains are powered and run through a series of test procedures to ensure they are ready for service. This process takes approximately 20 minutes per train, and is to occur in batches of 5 trains (for redundancy).
  - Once trains are prepared and ready for departure systems will remain on and idle.

- Interior cleaning of trains will occur in the stabling yard and be carried out on a daily basis, 2 hours following morning peak, 2 hours following evening peak and 2 hours once all trains have returned from service at night.

- Rolling stock:
  - Noise from trains will predominately relate to auxiliary systems on the train, including HVAC, CVS and air compressors.
  - Air compressors will typically operate only during start-up preparations, for a short period, until air reservoirs are full.
  - Silencers have been incorporated into the compressed air lines of the rolling stock to reduce noise from brake air release events.
  - The air reservoirs are required to be drained during preventative maintenance, this will occur within the maintenance building.
  - Enclosure of the compressor and provision of attenuators to the compressor air dryer and HVAC supply air fan.
  - HVAC system has been designed with multiple modes of operation, which vary in noise level, to ensure noise levels are minimised as far as practical according to operating load requirements.
  - Door test procedures, required during start-up of trains, have also been modified to reduce noise emission from the SMTF, with the chimes and automated announcements not being sounded.
  - The HVAC operation will automatically adjust to external ambient temperatures and to meet Project specifications for customer comfort and internal temperature conditions of the train.
  - Train speed will not exceed 25km/h (includes departure and arrival from the SMTF). Trains under manual control will be limited to 10km/h, with entry into maintenance building limited to 6km/h.
- Rail track:
  - The majority of rail track within the SMTF is to be formed on ballast.
  - To reduce potential increase in noise caused flanging at the wheel-rail interface, wheel flange lubricators are fitted to the rolling stock.
  - Trackside lubricators are also installed at two locations, at the main branches accessing the stabling roads and maintenance building.
- Maintenance building:
  - The Maintenance building includes: five stabling roads, train lift, loading area, three overhead cranes.
  - The scheduled and unscheduled maintenance of trains will be carried out on the service roads and lifting road in the Maintenance Building service roads and lifting road in the Maintenance Building.
  - Should heavy maintenance be proposed in the Maintenance building in the future, provision has been made for noisier works to be contained within bays along the northern side of the Maintenance building which can be readily upgraded through construction of internal partition walls, including additions to the external building envelope (internal skin), secondary roof and doors if

required. Modification of the intake louvres may be required to accommodate the changes.

- Heavy cleaning for each set will occur on an approximate monthly basis on the heavy cleaning road inside the Maintenance building.
- Cleaning is proposed to take place between 10:00 to 14:00 and 19:00 to 23:00 with an average of 1.32 jobs per day.
- Lighting and air-conditioning units may be turned on for the cleaning team.
- The Maintenance building will accept deliveries to the loading dock between 7:00am and 10:00pm only.
- Delivery truck movements are not proposed to occur between 10:00pm and 7:00am.
- The Maintenance building will be ventilated using assisted natural ventilation. A combination of smoke and ventilation fans on the roof, along with louvred ventilation openings along the sides of the building will assist in moving air through the building. These features have been incorporated into the noise model and form part of the acoustic design.
- Heating and cooling to specific work areas will also be provided with the associated external mechanical equipment located on the rooftop of the Maintenance building. The locations have been positioned so as they are away from building edges and acoustically shielded as far as practical by the sawtooth roof form.

- Administration building:
  - The Administration building will operate 24 hours per day, 7 days per week.
  - The only environmental noise sources associated with this building are mechanical plant and noise generated by car parking activities on site (mainly during shift changes).
- Car park:
  - Peak vehicle movements have been assessed as 30 one way trips (in or out) for a given 15-minute period. Table 4-1: SMTF Employment type mode share and parking provision estimates
- Train Wash Plant:
  - The single direction Train Wash Plant will be used from 07:00 to 15:00 and from 19:00 to 22:00, 7 days per week to meet Ultimate design operational requirements.
  - Potential future 24-hour operation of the Train Wash under Augmentation of the SMTF, will not significantly influence future noise emission from the site during the night time period.
  - The washing speed is set at 5 to 8km/h, and the entire washing cycle including car body washing, cab front washing and shunting is completed within 9 minutes.
- Under Floor Wheel Lathe:
  - A double headed underfloor wheel lathe is to be installed within the Wheel Lathe building.

- For the Ultimate design year scenario the wheel lathe is proposed to operate 8 hours per day, 7 days a week. The production rate is 5 passenger train wheelsets per 8-hour shift.
- Use may extend to 16 hours per day when expanded to 46 eight car sets and (07:00 to 23:00), and 24-hour work days for full Augmentation.
- The train is not operational during the lathing process and the train is moved using an electric train shunter.

- Infrastructure Workshop and Rail Store:
  - The Infrastructure Workshop is proposed to be used during the 07:00 to 18:00 daytime period only.
  - General operational noise sources from the buildings are limited to mechanical plant equipment.
- Distribution and Traction building:
  - The Distribution and Traction building equipment will operate 24 hours per day, 7 days per week.
  - The only environmental noise emission sources identified for this building are the transformers and reactor.
  - Harmonic Filters form part of the DC Switchboard and are installed indoors in a purpose built switch room. Noise emission will therefore not be significant and has not been included in the noise model.
  - Noise emission from circuit breakers has not been included in the operational noise assessment as they occur under fault conditions, which are highly irregular events.
- Bulk Supply building:
  - The Bulk Supply equipment will operate 24 hours per day, 7 days per week.
  - The only environmental noise emission source identified for this building is the bulk supply transformer.
- Fire pump room:
  - The pump only operates in emergencies and is not part of the environmental noise model.
  - A diesel pump with lower sound power will be sought during procurement.
  - Additional acoustic treatment of the building envelope is not considered reasonable or feasible for the limited operation of the pump.
  - The louvres have been positioned on the western and southern sides of the building so as to direct noise away from the most sensitive locations.

ONVR Mitigation Measures

The noise and vibration mitigation measures outlined in the ONVR documents (as detailed below) for the Sydney Metro Northwest have already been integrated into the design of the new network and are currently in the final stages of construction. These will be complete prior to the commencement of operation. The operational Noise and Vibration Compliance Assessment will be undertaken based on the ONVR criteria for the operation of the network, which have taken into consideration the inclusion of these mitigation measures.

Table E1: Sydney Metro Northwest Operational Noise and Vibration Mitigation Measures (Source: ONVR for SSI-5414)

ASPECT / LOCATION	SUMMARY OF ONVR MITIGATION MEASURE (ALREADY CONSTRUCTED / INSTALLED)
Rolling Stock	· Train horns are not to be utilised as part of normal operations. · Horns will not be used or tested within the SMTF site. · Horns will only be utilised in emergency situations where there is a risk that people may be present within the railway corridor.
Viaduct	· Parapets with acoustic panels on the inside face (not implemented near stations) either side of the viaduct. · Delkor Alt 1 rail fasteners (low stiffness). · Acoustic panels within the 'four foot' (not implemented near stations). · Rail dampeners are included in all areas of the viaduct structure.
Track and Wheels	· For sections of viaduct and tunnel track, low-stiffness rail fasteners. · For ballasted track sections, high-stiffness rail pads are utilised. · In areas away from stations rail dampers are included. · Monitoring of the wheel and rail condition, utilising the proposed wheel lathe to repair wheel defects and maintaining rail roughness levels via grinding. · Delkor Egg (Type RF167) rail fasteners in Type II track areas. · A wheel maintenance strategy will include when and rail monitoring regimes to identify areas of track or wheel defects. · Rail grinding will be undertaken in areas of increased track roughness and wheel defects repaired on the wheel lathe.
Acoustic Panels (General)	· In areas away from stations acoustic panels are included to minimise reflected noise from the four foot and parapet walls. · Noise barriers are provided adjacent to the OK Caravan Park on the northern side of the railway corridor between Windsor Road and the Second Ponds Creek Viaduct. Acoustic panelling is on the inside face of the noise barriers.

Noise Walls

Table 4-10 Summary of proposed noise barriers

Location	Height	Additional details
Up (eastern side) between Bella Vista Station and start of viaduct	Provision for noise barriers only – 1 m above rail level	-
Down (western side) between Bella Vista Station and start of viaduct	No Provision for noise barriers	-
Viaduct between Bella Vista Station and end of Windsor Road Bridge	Parapets 1.2m above rail level on both sides of viaduct	-
Up (northern side) between Windsor Road Bridge and Second Ponds Creek viaduct	Noise barriers are proposed adjacent to OK Caravan Park. Provision for noise barriers between OK Caravan Park and Windsor Road Bridge – 1 m above rail level	The proposed noise barriers adjacent to the OK Caravan Park will be constructed in two sections. The western section is located approximately 4.7 m from the Up track centreline. The eastern section is located 1.5 m from the property boundary. An overlap is provided between sections to allow vehicular access to the railway corridor. Refer alignment drawings in APPENDIX B for plan view location of noise barriers
Down (southern side) between Windsor Road Bridge and Second Ponds Creek viaduct	Provision for noise barriers only – 1 m above rail level where track is located at grade or on embankment	-
Second Ponds Creek viaduct	Parapets 1.2m above rail level on both sides of viaduct	-
Up (northern side) between Second Ponds Creek viaduct and Cudgegong Road	Provision for noise barriers only – 1 m above rail level	-
Down (southern side) between Second Ponds Creek viaduct and Cudgegong Road	No Provision for noise barriers	-

- One metre high noise barriers with absorptive facing have been considered between Bella Vista Station and Cudgegong Road Station (Tallawong Station), except where the track is in cutting (OpNV1).
- noise barriers (parapets) are located on both sides of the viaduct structure.
- For the surface track, noise barriers (including parapet walls) have been positioned as close to the train as possible.

At Property Treatments (General)

- For the single residential receivers at 798 Windsor Road and 38 Cudgegong Road at-property noise mitigation measures are proposed.

Table 4-11 At-property noise mitigation options

Noise mitigation option	Exceedance of noise trigger level	At-property noise mitigation treatment description
NR	0	At property treatment not required
A	1 to 5 dB(A)	Property boundary fencing or other external screen walls; and/ or AC/ Mechanical Ventilation: Ducted air-conditioning with fresh air ventilation; or Split system air-conditioning with separate fresh air mechanical ventilatio ducted systems are not practical; or Fresh air mechanical ventilation, for example where air-conditioning exist property or preferred by property owner. The above is dependent on advice from air-conditioning / mechanical ve contractor for rooms requiring windows/doors to be closed for noise miti
B	6 to 10 dB(A)	In addition to the above: Replace existing weather seals with acoustic seals (e.g. Q-Lon seals from S
C	11 to 15 dB(A)	In addition to the above: Replace existing glazing with 6.38mm laminated glazing.

Table 4-12 Sensitive receiver locations with residual exceedances of noise trigger levels

ID	Receiver	Noise reduction required	Potential noise mitigation options
43660-092D-RES 43705-092D-RES 43720-093D-RES 43735-091D-RES	Upper floor of four residential buildings between Chainage 43660 m and 43735 m (between 1 Miller Way and 11 Miller Way).	1 dB(A)	Option A at-property treatments; or acceptance of minor exceedances of noise trigger levels[1]
44200-093D-RES 44255-093D-RES 44355-099D-RES 44395-098D-RES	Upper floor of four residential buildings between Chainage 44200 m and 44395 m (between 5 Kilbenny Street and 15 Kilbenny Street).	1 dB(A)	Option A at-property treatments; or acceptance of minor exceedances of noise trigger levels[1]
45640-055U-RES	798 Windsor Road.	6 dB(A)	Option A or B at-property treatments are proposed for this single, isolated residential dwelling
46765-058U-RES	38 Cudgegong Road	1 dB(A)	Option A at-property treatments are proposed for this single, isolated residential dwelling
Other Sensitive Receivers			
41340-123D-CHC	Fit Kidz Daycare, 6 Rothwell Circuit.	Internal $L_{Aeq(1hour)}$ noise levels at this locality are predicted to be 50 dB(A), which are 10 dB(A) higher than the noise trigger levels.	Option A or B at-property treatments; or acceptance of exceedances of noise trigger levels[1]
41680-189U-POW	Iglesia Ni Cristo Church.	Internal $L_{Aeq(1hour)}$ noise levels at this locality are predicted to be 47 dB(A), which are 7 dB(A) higher than the noise trigger levels.	Option A or B at-property treatments; or acceptance of exceedances of noise trigger levels[1]
43430-383D-POW	St John XXIII Catholic Church.	Internal $L_{Aeq(1hour)}$ noise levels at this locality are predicted to be up to 44 dB(A), which are 4 dB(A) higher than the noise trigger levels.	Option A or B at-property treatments; or acceptance of exceedances of noise trigger levels[1]
43480-223D-SCH 43520-244D-SCH 43540-314D-SCH 43595-264D-SCH 43595-285D-SCH 43600-235D-SCH	St John XXIII Catholic Church School.	Internal $L_{Aeq(1hour)}$ noise levels at this locality are predicted to be up to 50 dB(A), which are 10 dB(A) higher than the noise trigger levels.	Option A or B at-property treatments; or acceptance of exceedances of noise trigger levels[1]

Note 1: The determination of whether the predicted exceedance is acceptable or not will be determined on the basis of factors including the building construction type, existing noise levels, land use and predicted noise levels.

<table>
<tr><td>Tunnel Ventilation</td><td>

- Acoustic silencers between the fans and opening on the ground surface have been incorporated into the design.

</td></tr>
<tr><td>Traction Substations</td><td>

- Quiet equipment options will be included where feasible and reasonable.
- Acoustic attenuators, acoustic lining of ductwork, enclosing noisy equipment, construction of barriers to shield noise sensitive receivers have been implemented.

</td></tr>
<tr><td>Public Address System</td><td>

- Public Announcement System will make announcements as follows:

Table 5-2 PAS coverage areas and announcement types

<table>
<tr><th></th><th></th><th colspan="8">Announcement Type</th></tr>
<tr><th></th><th>Time period</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th></tr>
<tr><td>Coverage Area</td><td></td><td>Only platform concerned</td><td>Platform concerned, concourse & entrance</td><td colspan="5">Concourse, platform & station entrance</td><td>All a</td></tr>
<tr><td rowspan="3">Announcement Frequency</td><td>AM peak 6:00am to 8:30am
PM peak 4:30pm to 7:30pm</td><td>2.4 min to 4 min per Table 4-7</td><td rowspan="3">2 min (adjustable) or when required</td><td colspan="5" rowspan="3">15 min (adjustable)</td><td>3 min or when required</td><td>2 m whe requ</td></tr>
<tr><td>Off peak train periods 8:30am to 4:30pm and 7:30pm to 10:00pm</td><td>10 minutes per Table 4-7</td><td></td></tr>
<tr><td>10pm to 6am night-time</td><td>Only underground stations</td><td colspan="5">Only underground stations</td><td></td></tr>
<tr><td>Announcement Types</td><td colspan="9">1: Automatic announcements of train arrival at platform concerned
2: Train service delay announcements
3: Educational announcements (e.g. escalator safety)
4: Reminder announcements (e.g. beware of slippery floor during wet weather)
5: Promotional announcements (e.g. advertising)
6: Directional announcements (e.g. giving information relating to which station exit should be used for events)
7: Crowd control announcements
8: Emergency announcements (e.g. station evacuation during incident)</td></tr>
</table>

- No announcements are to be made from 10pm and 6am.

</td></tr>
<tr><td>Epping Services Facility</td><td>

The following noise mitigation measures have been incorporated into the detailed design:

- The quietest available equipment that meets the mechanical specification has been selected.
- Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises
- High Voltage (HV) electrical equipment has been located on the eastern side of the traction substation building to maximise acoustic shielding of the building for the receivers to the west
- Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant

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	• Acoustic louvres are incorporated into the facade of the ESF transformer rooms opening towards the west • Acoustically lined and lagged ductwork • Acoustic barriers between plant and sensitive neighbouring premises • Acoustic barrier is incorporated on the roof of the traction substation building to mitigate noise from HV electrical equipment located outside buildings • Partial or complete acoustic enclosures over plant • Equipment is vibration isolated from the structure to minimise structure-borne noise
Cheltenham Services Facility	The following noise mitigation measures have been incorporated into the detailed design: • The quietest available equipment that meets the mechanical specification has been selected • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the design of the plant room for fresh air intake from the surface • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • The use of low noise/night mode for equipment that does not need to be operated during night-time period such as some condensing units • Equipment is vibration isolated from the structure to minimise structure-borne noise
Cherrybrook Station	The following noise mitigation measures have been incorporated into the detailed design: • The quietest available equipment that meets the mechanical specification has been selected • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the noise barrier to mitigate noise emission from rooftop plant • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • Use of low noise/night mode for equipment that does not need to be operated during night-time period such as some condensing units • Complete acoustic enclosures over plant

	• Acoustic barriers between plant and sensitive neighbouring premises • Acoustic barrier is incorporated on the roof of the services building to mitigate noise from outdoor condenser units • Equipment is vibration isolated from the structure to minimise structure-borne noise
Castle Hill Station	• Noise attenuators for the draught relief shaft (DRS) system. • Operation of the PAS will only occur between 6am and 10pm. • The following noise mitigation measures have been incorporated into the detailed design: • The quietest available equipment that meets the mechanical specification has been selected • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the noise barrier to mitigate noise emission from rooftop plant • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • Use of low noise/night mode for equipment that does not need to be operated during night-time period such as some condensing units • Complete acoustic enclosures over plant • Acoustic barriers between plant and sensitive neighbouring premises • Acoustic barrier is incorporated on the roof of the services building to mitigate noise from outdoor condenser units • Equipment is vibration isolated from the structure to minimise structure-borne noise
Showground Station	• Noise attenuators for the draught relief shaft (DRS) system. • Operation of the PAS will only occur between 6am and 10pm. • The quietest available equipment that meets the mechanical specification has been selected • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the noise barrier to mitigate noise emission from rooftop plant • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • The use of low noise/night mode for equipment that does not need to be operated during night-time period such as some condensing units • Complete acoustic enclosures over plant

	• Acoustic barriers between plant and sensitive neighbouring premises • Acoustic barrier is incorporated on the roof of the services building to mitigate noise from chillers and outdoor condenser units • Equipment is vibration isolated from the structure to minimise structure-borne noise
Northwest Station	• Operation of the PAS will only occur between 6am and 10pm. • The quietest available equipment that meets the mechanical specification has been selected • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the noise barrier to mitigate noise emission from rooftop plant • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • Use of low noise/night mode for equipment that does not need to be operated during night-time period such as some condensing units • Complete acoustic enclosures over plant • Acoustic barriers between plant and sensitive neighbouring premises • Acoustic barrier is incorporated on the roof of the services building to mitigate noise from chillers and outdoor condenser units • Equipment is vibration isolated from the structure to minimise structure-borne noise
Bella Vista Station	• Operation of the PAS will only occur between 6am and 10pm. • The quietest available equipment that meets the mechanical specification has been selected • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the noise barrier to mitigate noise emission from rooftop plant • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • Use of low noise/night mode for equipment that does not need to be operated during night-time period such as chillers and condensing units • Complete acoustic enclosures over plant • Acoustic barriers between plant and sensitive neighbouring premises • Acoustic barrier is incorporated on the roof of the services building to mitigate noise from chillers and outdoor condenser units • Equipment is vibration isolated from the structure to minimise structure-borne noise

Kellyville Station	• Operation of the PAS will only occur between 6am and 10pm. • The quietest available equipment that meets the mechanical specification has been selected • Atrategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the noise barrier to mitigate noise emission from rooftop plant • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • The use of low noise/night mode for equipment that does not need to be operated during night-time period such as chillers and condensing units • Complete acoustic enclosures over plant • Acoustic barriers between plant and sensitive neighbouring premises • Acoustic barrier is incorporated on the roof of the services building to mitigate noise from chillers and outdoor condenser units • Equipment is vibration isolated from the structure to minimise structure-borne noise
Rouse Hill Traction Substation	• The quietest available equipment that meets the mechanical specification has been selected • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the noise barrier to mitigate noise emission from rooftop plant • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • Complete acoustic enclosures over plant • Equipment is vibration isolated from the structure to minimise structure-borne noise
Rouse Hill Station	• Operation of the PAS will only occur between 6am and 10pm. • The quietest available equipment that meets the mechanical specification has been selected • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustic louvres are incorporated into the noise barrier to mitigate noise emission from rooftop plant

	• Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • The use of low noise/night mode for equipment that does not need to be operated during night-time period such as chillers and condensing units • Complete acoustic enclosures over plant • Acoustic barriers between plant and sensitive neighbouring premises • Acoustic barrier is incorporated on the roof of the services building to mitigate noise from chillers and outdoor condenser units • Equipment is vibration isolated from the structure to minimise structure-borne noise • Volume of the PAS announcements on platform areas during the shoulder (6am to 7am) and evening 96pm to 10pm) periods is limited to 67dB(A).
Cudgegong Station (Tallawong)	• Operation of the PAS will only occur between 6am and 10pm. • The quietest available equipment that meets the mechanical specification has been selected. • Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises • Commercially available acoustic attenuators/louvres for air discharge and air intakes of plant • Acoustically lined and lagged ductwork • Equipment where possible is located internally within the structure of the building to reduce noise break-out • Complete acoustic enclosures over plant • Equipment is vibration isolated from the structure to minimise structure-borne noise
Road Traffic	• The predicted noise increases at all stations, and surface facilities as a result of road traffic associated with the O&M Phase of the Project have found to be barely perceptible and therefore no acoustic treatment is required at adjacent receivers.

Appendix F.Compliance assessment report (TK920-04F01 Compliance with C22 F5 and EPL R4.4 (r1)