PROJECT MANAGEMENT PLAN

Flora and Fauna Management Plan

Sydney Metro West – Western Tunnelling Package

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Document Details

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Signature	Signature	Signature
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DOCUMENT CONTROL

The current document version number and date of revision are shown in the document footer. All changes made to the Management Plan during its implementation on a live project are to be recorded in the amendment tables below.

Revision History

Revision	Date	Description of changes	Prepared by	Approved by
A	17/01/2022	Early Works Submission		
B	04/03/2022	Draft for stakeholder consultation		
C	04/04/2022	Revised draft for stakeholder consultation		
D	18/05/2022	Final draft following stakeholder consultation		
E	04/08/2022	Update for Modification 2 and 3 approval and additional stakeholder comments		
F	04/10/2022	Updated to address Sydney Metro and ER comments		
G	23/11/2023	Updated to include SOP scope		
H	18/12/2023 14/01/2024	Updated to address SM and ER Comments		

Terms and Definitions

Term	Definition
BAM	Biodiversity Assessment Method
BC	Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CSSI	Critical State Significant Infrastructure
DPI	Department of Primary Industries (NSW)
DPE	Department of Planning and Environment (NSW)
DCCEW PMST	Department of Climate Change, Energy, the Environment and Water Protected Matters Search Tool
EA	Environmental Advisor
ECM	Environmental Control Measures
EEC	Endangered Ecological Communities
EIS	Environmental Impact Statement
EM	Environmental Manager
EMS	Environmental Management System
EPA	Environmental Protection Authority
EPBC	Environmental Protection and Biodiversity Conservation Act 1999
EPL	Environmental Protection License
ER	Environmental Representative
ESCP	Erosion and Sediment Control Plan
ESR	Environmental Site Representative
EWMS	Environmental Work Method Statement
FBA	Framework for Biodiversity Assessment
FFMP	Flora and Fauna Management Plan
FM	Fisheries Management Act 1994
GLC	Gamuda Australia – Laing O'Rourke Consortium
GDE	Groundwater Dependent Ecosystems
GGBF	Green and Golden Bellfrog
HTW	High Threat Weed
IS	Infrastructure Sustainability
ISC	Infrastructure Sustainability Council
MCoA	Ministers' Condition of Approval
MSF	Maintenance and Stabling Facility
PCT	Plant Community Types
PM	Project Manager

Term	Definition
PMS	Parramatta Metro Station
POEO	Protection of the Environment Operations Act 1997 (NSW)
REMM	Revised Environmental Mitigation Measures
SDS	Safety Data Sheet
SM	Sydney Metro
TEC	Threatened Ecological Communities
VDP	Vegetation Disturbance Permit
VRZ	Vegetation Retention Zones
WMS	Westmead Metro Station
WON	Weeds of National Significance

1 INTRODUCTION

1.1 Project Description

The scope of the work being undertaken under the Sydney Metro West Western Tunnelling Package works (WTP) (the Project) includes but is not limited to, the following:

- Westmead Station box excavation, including temporary support, stub tunnels, partially mined station cavern and crossover cavern including permanent lining and support
- Parramatta Station, including excavation of station box and associated support
- Clyde Maintenance and Stabling Facility (MSF), including permanent dive structure, portal, spur running tunnels, spur tunnel junction cavern, bulk earthworks, civil structures, utilities corridor, road crossing and creek diversion
- Rosehill Services Facility, including shaft excavation, permanent lining and lateral support
- A precast segment manufacturing facility at Eastern Creek
- Demolition and site clearance works
- Tunnelling between Sydney Olympic Park (SOP) and Westmead. Tunnelling will be undertaken by placing the tunnel boring machines (TBMs) at the Rosehill Services Facility box and retrieved out at the SOP Station Box and then placed back at the Rosehill Services Facility and retrieved at the Westmead Station Box. Some surface works will be required for site establishment and to facilitate TBM retrieval and relaunching, such as crane set up and plant and material deliveries. Station box works would also be required to facilitate TBM retrieval and re-launching.

Refer to Figure 1 for the location of the WTP project.

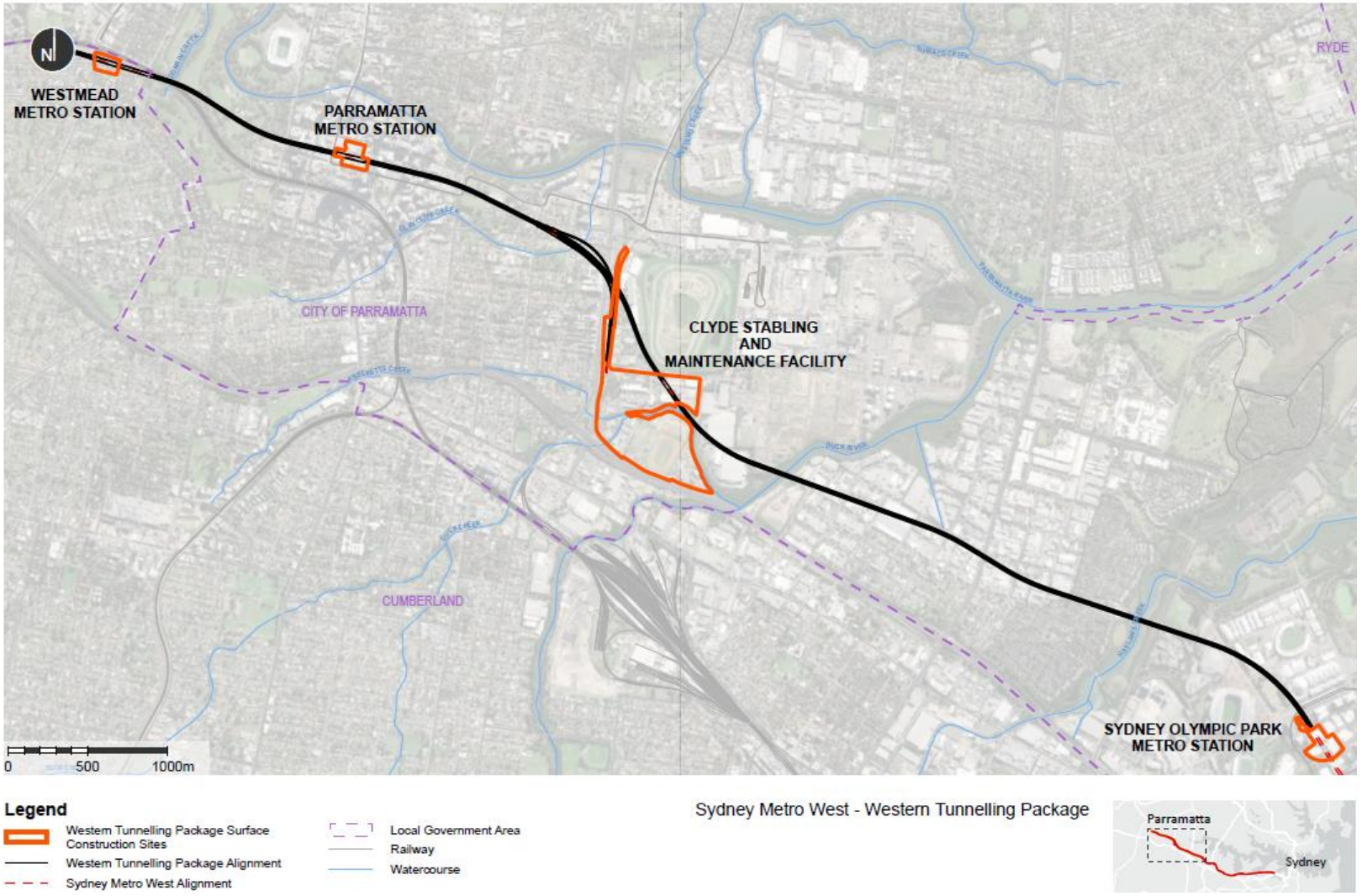


Figure 1: WTP Project Location

1.2 Context

The Construction Environmental Management Plan (CEMP) and sub-plans have been developed for the delivery of the WTP. It will be delivered by Gamuda Engineering (Australia) and Laing O'Rourke Consortium (GLC). This Flora and Fauna Management Plan (FFMP) forms part of the CEMP (SMWSTWTP-GLO-1NL-EV-PLN-000001).

Sydney Metro West – Westmead to The Bays Concept and Stage 1 received planning approval on 11 March 2021 (SSI 10038). The Project comprises the WTP, which is the western portion of Stage 1 of SSI 10038, from Sydney Olympic Park to Westmead. This FFMP has been prepared to address requirements of the Minister's Conditions of Approval (MCoA) and any modifications to the MCoA, Revised Environmental Management Measures (REMMs) listed in the Sydney Metro West – Submissions Report, dated 20 November 2020, the Construction Environmental Management Framework (CEMF) requirements and all applicable legislation as they relate to the Project.

1.3 Environmental Management System Overview

An overview of the Environmental Management System (EMS) is provided in the CEMP Section 3.

Key interactions for this sub-plan with other management plans in the EMS include:

- Site Establishment Management Sub-plan
- Soil and Water Management Sub-plan
- Heritage Management Sub-plan
- Air Quality Management Sub-plan
- Noise and Vibration Management Sub-plan
- Groundwater Management Sub-plan
- Waste Management Sub-plan
- Spoil Management Sub-plan
- Visual Amenity Management Sub-plan.

1.4 Consultation Requirements

In accordance with MCoA C5, this FFMP was prepared in consultation with relevant government agencies including:

- Department of Planning and Environment (DPE) – Environment, Energy, and Science (ESS) (now Biodiversity, Conservation and Science (BCD),
- Department of Primary Industries (DPI) Fisheries,
- Sydney Olympic Park Authority (SOPA) (in respect of Sydney Olympic Park),
- City of Parramatta Council, and
- Cumberland City Council.

Consultation was undertaken over a 21-day period, commencing on 8 April 2022 with the submission of the FFMP. The Consultation approach was applied across all plans and stakeholders and included issuing of the document to stakeholders accompanied by an introductory workshop. Following receipt of comments two weeks later, an offer was made to hold a comment review workshop to discuss and close comments directly with the stakeholder the following week. A second workshop would also be made available should there be any outstanding or technical issues requiring further discussion.

An introductory meeting was held on 24 March with City of Parramatta Council, 1 April with SOPA and 7 April with Cumberland City Council, which was organised by Sydney Metro and delivered by GLC. At the introductory meeting, GLC introduced themselves, the project team and outlined the scope of the WTP. The consultation approach was presented, and feedback invited on that approach. No issues were raised on the consultation approach during the introductory meetings.

None of the stakeholders took the offer of a comment review workshop in relation to their review of this FFMP.

Details of issues raised by stakeholders during consultation is provided in Attachment 2, including copies of correspondence in accordance with MCoA A6. Cumberland City Council provided comments on the 13 May 2022, which was outside the 21-day consultation period. These comments have been addressed in Revision E of the FFMP. Further consultation details are provided in Attachment 2. The approach to consultation is further outlined in the CEMP.

1.5 Certification and Approval

Sydney Metro West – Westmead to The Bays Concept and Stage 1 was subject to environmental impact assessment under the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). It was also declared a Critical State Significant Infrastructure (CSSI) by the Minister for Planning & Public Spaces (the Minister).

An Environmental Impact Statement (EIS) has been prepared under Division 5.2 of the EP&A Act and in accordance with Part 3 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. Following exhibition of the EIS, an Amendment Report and Submissions Report were also prepared. After an assessment was carried out, the Minister determined that the Sydney Metro West – Stage 1 would be approved subject to conditions.

- Modification 1 of the Project Approval, which sought to amend Conditions of Approval A11d, C10 and D25 and propose a new Condition A39.1, was approved on 28 July 2021.
- Modification 2 of the Project Approval, relating to the relocation and extension of the Rosehill dive structure and realignment of Kay Street and Unwin Street, was approved on the 3 June 2022.
- Modification 3 of the Project Approval, to amend Conditions of Approval C-B10, D10, D11, D18, D37, D63 and D66, was approved on the 4 July 2022.
- Modification 4 of the Project Approval, to amend Conditions of Approval D22, and D122 was approved on the 23 December 2022.
- Modification 5 of the Project Approval sought an administrative change to the total amount of Plant Community Type 920 (PCT 920) that could be removed, increasing the clearing limit by an additional 0.40 ha. This Modification also sought to amend Conditions of Approval D4, D6 and add D6A and D6B. It was approved on 20 September 2023.

The planning approval (Infrastructure Approval SSI 10038) and related environmental assessment documents are located at: https://www.planningportal.nsw.gov.au/major-projects/project/25631.

Revision C of this FFMP was approved by the Planning Secretary (DPE) on the 11 July 2022 following ER endorsement on 20 May 2022. This FFMP was submitted to the Planning Secretary on 20 May 2022 for approval, no later than one (1) month before the commencement of construction. Construction commenced on the 19 July 2022.

This FFMP, as submitted to the ER and DPE, including any minor amendments endorsed by the ER, will be implemented for the duration of construction.

2 PURPOSE AND SCOPE

2.1 Purpose

The purpose of this FFMP is to describe the flora and fauna management approach that will be employed by the Gamuda Australia – Laing O'Rourke Consortium (GLC) and its subcontractors during construction of the Project. This sub plan forms an integral part of the project CEMP and GLC's EMS. It applies to all works associated with Project works and establishes the environmental management controls to be implemented.

This FFMP outlines how GLC will comply with and implement the applicable flora and fauna requirements of the:

- Sydney Metro Construction Environmental Management Framework (CEMF)
- Minister for Planning and Public Space's Conditions of Approval for the Project (MCoA)
- Revised Environmental Mitigation Measures (REMMs)
- SSI Modifications - Modification 1 Administrative Modification
- SSI Modifications - Modification 2 Clyde Stabling and Maintenance Facility
- SSI Modifications – Modification 3 Administrative Modification
- SSI Modifications – Modification 4 Administrative Modification
- SSI Modifications – Modification 5 Administrative Modification
- Infrastructure Sustainability Council (ISC) Infrastructure Sustainability (IS) rating tool.

This FFMP has been revised following the approval of Modification 5 and issue of updated MCoA on the 20 September 2023.

2.2 Scope

This sub-plan outlines the mitigation and management measures that GLC will use to address potential flora and fauna impacts during construction of the Project, while complying with relevant approval, statutory and contract requirements.

Specifically, this sub-plan addresses environmental aspects and impacts that relate to:

- Site establishment activities
- Removal and trimming of vegetation and trees, including street trees
- Demolition of existing structures
- Realignment of Duck Creek and A'Becketts Creek, Clyde (to be partly enclosed in proposed culverts and remainder to be retained as a naturalised channel)
- Set up and use of material, plant and spoil storage areas during construction
- Movement of vehicles and plants to and from the construction site
- The use of machinery and equipment such as mobile cranes, excavators, concrete pumps, piling rigs
- Introduction of car parks, acoustic sheds, spoil sheds, laydown areas, workshops, dangerous goods storage, wheel wash, site offices and staff amenities during construction
- Adjustment of road networks
- Noise barriers and hoardings
- Construction of open dive structures

- General earthworks
- Operation of construction lighting during night-time construction works.

3 OBJECTIVES AND TARGETS

The key objectives of the FFMP are to ensure that impacts to flora and fauna are minimised and are within the scope permitted by the MCoA. To achieve these objectives, the targets in Table 1 have been established for the management of flora and fauna impacts during the Project construction.

Table 1: Flora and fauna targets and performance criteria

Objective	Target	Measurement Tool
Avoid and minimise impacts on flora and fauna.	Adverse impacts on native flora and fauna as a result of construction activities are avoided (where possible) and minimised, including the clearing of native vegetation.	Weekly site inspections, visual surveillance, Pre-clearing Permit, Tree Register, implementation of flora and fauna control measures and auditing.
Compliance with the MCoA, REMMs, CEMF requirements and relevant legislation as it applies to the Project	Full compliance	Compliance Reporting
Design waterway modifications and crossings to incorporate best practice principles.	Incorporate best practice principles for waterway modifications (including Duck Creek and A'Becketts Creek) in design plans and construction management plans. Significant impacts to flow regimes in receiving waterways are avoided.	Design review procedure, monitoring of groundwater dependent ecosystems and waterway function (part of the monitoring and auditing actions).
Retain and enhance existing flora and fauna habitat wherever possible.	Include control measures in the FFMP that ensures all existing flora and fauna on site is protected from accidental impacts during construction.	Weekly site inspections, visual surveillance, implementation of flora and fauna control measure and auditing. Condition monitoring at Duck Creek / A'Becketts Creek. Groundwater dependent ecosystem monitoring. Revegetation monitoring program.
Appropriately manage the spread of weeds and plant pathogens.	Include control measures in the FFMP that manages the potential risk of spreading weeds and pathogens.	Management of retained vegetation. Revegetation monitoring program.
Ensure project personnel are aware and competent in their responsibilities in relation to the	100% of project personnel aware of responsibilities under the CEMF and this FFMP	Project induction and training register Compliance management program

Objective	Target	Measurement Tool
management of flora and fauna		
Meet IS rating tool requirements and objectives in the Sustainability Management Plan	Level 1 for credit Lan-1 'Previous Land Use' showing that at least 25% of the land used for the project is previously disturbed. Level 2 for credit Lan-3 'Contamination and remediation' demonstrating that site assessment follows the recommended approach in Schedule A 'Recommended general process for assessment of site contamination' of National Environment Protection (Assessment of Site Contamination) Measure 1999, with remediation options identified and selected using a sustainability hierarchy, as well as the sustainability appraisal of remediation option being undertaken against sustainability indicators in Table 1 of 'A Framework for Assessing the Sustainability of Soil and Groundwater Remediation' Level 1 for credit Lan-4 'Flooding Design' to show there is no increase in flood risk from the construction, as the run-off, flood risk, and potential increased flood risk elsewhere as a result of the project have all been assessed over their expected working life, in line with the requirements of 'Flood plain management in Australia: best practice principles and guidelines'. Note. Eco-1 'Ecological value' and credit Eco-2 'Habitat connectivity' will be scoped out.	Lan-1: EIA and Site Layout calculations Lan-3: Contamination reports, remediation action plans, audit reports, audit qualifications Lan-4: Design report

4 ENVIRONMENTAL REQUIREMENTS

4.1 Legislation and Standards

GLC obligations include satisfying the requirements and complying with the provisions of the relevant legislation, guidelines, and policies, as well as international and Sydney Metro's standards. Details are provided in Table 2.

Table 2: Relevant legislations, standards, guidelines, and specifications

Legislation	*Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act).* *Biodiversity Conservation Act 2016 (NSW) (BC Act)* *Biosecurity Act 2015 (NSW)* *Fisheries Management Act 1994 (NSW) (FM Act)* *Pesticides Act 1999 (NSW)* *Environmental Planning and Assessment Act 1979 (NSW)* *Protection of the Environment Operations Act 1997 (NSW)* *National Parks and Wildlife Act 1974 (NSW)* *State Environmental Planning Policy (Coastal Management) 2018 (NSW)*
Standards	AS/NZS ISO 14001: Environmental Management
Guidelines and Specifications	Best Practice Management Guidelines for Phytophthora cinnamomi within the Sydney Metropolitan Catchment Management Authority Area (Botanic Gardens Trust 2008) New South Wales Weed Control Handbook (DPI 2018) Hygiene protocol for the control of disease in frogs (DECC 2008) Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom 2004) and Volume 2 (Department of Environment and Climate Change 2008) (the "Blue Book"). Australian Standard AS 4373 Pruning of Amenity Trees Australian Standard 4970 – Protection of trees on development sites Commonwealth Significant Impact Guidelines for the Green and Golden Bell Frog (2009) Commonwealth Approved Conservation Advice for Litoria aurea (Green and Golden bell Frog) (TSSC 2014) EPA Resource Recovery Order 2014 – Raw Mulch; EPA Resource Recovery Exemption 2014 – Raw Mulch Fish Passage Requirements for Waterway Crossings, Fairfull and Witheridge, 2003 Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings – November 2003 Guidelines for Fish Habitat Conservation and Management – Update 2013 (DPI, 2013) Guidelines for riparian corridors on waterfront land (DPI Water, 2012) Guidelines for vegetation management plans on waterfront land (DPI Water, 2012) Guidelines for watercourse crossings on waterfront land (DPI Water, 2012)

	Guidelines for instream works on waterfront land (DPI Water, 2012) Guidelines for outlet structures on waterfront land (DPI Water, 2012) NSW Department of Primary Industries, Why Do Fish Need to Cross the Road (DPI Fisheries, 2003) Biodiversity Assessment Method (BAM) (DPIE 2017) Relevant recovery plans, priority action statements and best practice guidelines, including relevant Australian Standards Risk Assessment Guidelines for Groundwater Dependent Ecosystems (DPI 2012)

4.2 Approvals, Licenses and Permits

This FFMP has been developed to satisfy the requirements of MCoA C1. A full list of applicable MCoAs, REMMs, CEMF requirements and EPL condition requirements is provided in Attachment 1 of this FFMP.

Other legislation relevant to this FFMP is included in Attachment 2 of the CEMP.

4.2.1 Biodiversity Offsets

Before any vegetation clearing or tree removal is undertaken for vegetation that must be offset under either the Biodiversity Conservation Act (2016) or the Fisheries Management Act (1994) (FM Act), Biodiversity Credits would be purchased and retired by Sydney Metro. The retirement of credits would be carried out in accordance with the offset rules of the BC Act and FM Act.

Evidence of the retirement of credits under the BC Act required by MCoA D4 will be submitted to the Planning Secretary for information within one (1) month of receiving evidence of the retirement of credits and/or a certificate confirming payment under MCoA D5 before any vegetation clearing or tree removal that must be offset.

Evidence of the retirement of credits under the FM Act required by MCoA D6A will be submitted to the Planning Secretary for information within one (1) month of receiving evidence of the retirement of credits and/or a certificate confirming payment to the DPI Fish Conservation Trust Fund. The timing of payment however, must be made within the time specified in the Key Fish Habitat (KFH) Offset Strategy as required by Condition MCoA D6B.

4.2.1.1 Offset under the Biodiversity Conservation (BC) Act 2016

The BC Act seeks to conserve biological diversity, promote ESD, prevent extinction and promote the recovery of threatened species, populations and ecological communities and to protect areas of outstanding biodiversity value.

A Biodiversity Development Assessment Report (BDAR) was undertaken for Modification 5 (undertaken by East Coast Ecology on behalf of Gamuda (Engineering) Australia in 2023). Section 7.3 of the BC Act require that the significance of impact to threatened species and endangered ecological communities be assessed using a five-part test. Where a significant impact is likely to occur, a species impact statement (SIS) must be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM).

Offset requirements are as follows:

- PCT 920: Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion – Poor (11 credits)

- Myotis macropus / Southern Myotis (11 credits)
- For impacts of up to 27 individuals and 0.14 hectares of Downy Wattle (as per the Modification 2 Report) habitat equating to 1 credit.

Sydney Metro will be responsible for acquiring and submitting evidence of the retirement of credits, including the submission of information to the secretary in relation to MCoA D4, D5 and D6.

4.2.1.2 Offset under the Fisheries Management (FM) Act 1994

The FM Act aims to conserve and manage fisheries and aquatic systems in NSW. It provides mechanisms for listing threatened species and considering their impacts in development proposals. It plays a vital role in preserving aquatic habitats for present and future generations.

The Clyde MSF project area includes the realignment of A ‘Becketts Creek and Duck Creek which would require the removal of 0.55 hectares of Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion (PCT 1747) and would require a permit to harm marine vegetation under Section 205 of the FM Act. The offsetting rules of the NSW DPI Policy and Guidelines for Fish Habitat Conservation and Management (NSW DPI, 2013) are applicable as the guidelines are intended to feed into the assessment of State Significant Infrastructure projects to ensure the sustainable management, and ‘no net loss’ of key fish habitats in NSW.

Offset requirements as applicable to the project are as follows:

- 0.53 ha of coastal wetlands (Type 1 KFH)
- 0.11 ha of mature mangroves and associated pneumatophores/saplings (Type 2 KFH).

KFH must be offset at a ratio of 2:1 in accordance with documents listed in Condition A1 of the MCoA, with Sydney Metro being responsible for MCoA D6A and D6B..

4.3 IS Rating Tool Requirements

Credit	IS Rating Tool Requirement	Document Reference
Lan-1 L1	25% of the land used for the project is previously disturbed.	Design and management reports
Lan-3 L1	Site assessment follows the recommended approach in Schedule A 'Recommended general process for assessment of site contamination' of National Environment Protection (Assessment of Site Contamination) Measure 1999. Remediation options are identified and selected using a sustainability hierarchy.	Soil and Water Management Sub-plan (SWMP) Remediation Action Plan
Lan-3 L2	Sustainability appraisal of remediation options is undertaken against the sustainability indicators in Table 1 of 'A Framework for Assessing the Sustainability of Soil and Groundwater Remediation'.	SWMP
Lan-4 L1	The run-off, flood risk, and potential increased flood risk elsewhere as a result of the project have all been assessed over their expected working life, in line with the requirements of 'Flood plain management in Australia: best practice principles and guidelines' and appropriate flood	SWMP

Credit	IS Rating Tool Requirement	Document Reference
	resilience measures have been included in the design so that there is no increase in flood risk.	

5 EXISTING ENVIRONMENT

5.1 General Landscape Features

The landscape features surrounding the Project construction sites are outlined below.

5.1.1 Bioregions and Sub-regions

Bioregion: Sydney Basin

Sub-regions: Cumberland Plain.

5.1.2 BioNet NSW Landscapes

Ashfield Plains: Undulating hills and valleys on horizontal Triassic shale and siltstone, occasional quartz sandstones especially near the margin of the Port Jackson landscape. General elevation 0 to 45 m and a local relief of less than 20 m (Jacobs, 2020).

Port Jackson Basin: Deep elongated harbour with steep cliff margins on horizontal Triassic quartz sandstone. Small pocket beaches and more extensive Quaternary estuary fill of muddy sand at the head of most tributary streams. General elevation 0 to 80 m and local relief between 10 m to 50 m (Jacobs, 2020).

5.1.3 Rivers, Streams and Estuaries

The Project construction sites are located within the Parramatta River/Port Jackson subcatchment of the Sydney Metro catchment (Department of Primary Industries, 2019). The tunnel alignment would pass at depth beneath Domain Creek, Clay Cliff Creek, Duck River, Haslams Creek, Saleyards Creek, Powells Creek and Iron Cove. As part of the works, structures would be built within and over A'Becketts Creek and Duck Creek (Jacobs, 2020).

5.1.4 Wetlands

Mapped areas of wetland are present within 200 m of the Project construction sites and are listed under State Environmental Planning Policy (Coastal Management) 2018 as well as the Parramatta LEP (2023) (Item 11). This includes vegetation along the Duck River and Mason Park wetlands (Jacobs, 2020), as well as along Parramatta River which resides outside the project boundary.

5.1.5 Habitat Connectivity

The habitat surrounding the Project construction sites have a low degree of connectivity to other areas of habitat due to impacts of urbanisation. Habitat within the study area generally occurs as small, isolated fragments.

North of Westmead Metro Station, there is a broken corridor of habitat that connects Coopers Creek and Toongabbie Creek to Darling Mills Creek and eventually the Parramatta River. The corridor then follows Duck River to the south. This corridor does not interact with the Project.

A corridor begins at Haslams Creek which provides a north south corridor from the Parramatta River to the vegetation along the M4 Motorway. Haslams Creek is also linked to Powells Creek forming a wetland corridor which would likely be used by birds and bats. The Sydney Metro West tunnels would pass beneath Haslams Creek (at about 30 m below ground level).

Planted trees and gardens surrounding the Project construction sites also provide some connectivity for mobile species such as the Grey-headed Flying-fox and birds that can use the resources available in urban areas (Jacobs, 2020).

5.1.6 Areas of Outstanding Biodiversity Value

None.

5.2 Native Vegetation

Vegetation within the Project construction sites consist of a mix of native PCTs and planted native vegetation. According to the Sydney Metro West – Stage 1 EIS, the Project construction sites support two Plant Community Types (PCTs), including PCT 920 at Clyde MSF and PCT 849 at Westmead Metro Station. The location of each PCT across the sites and their conformity to threatened ecological communities is outlined in Table 3 and shown on Figure 2.

Since the preparation of the EIS, the construction boundary for Westmead Metro Station has been refined to avoid the clearing of any PCT 849 vegetation.

Planted native vegetation that does not conform to a NSW PCT occurs at Parramatta metro station construction site and Sydney Olympic Park metro station construction site.

Table 3: PCTs within the Project Construction Sites (as from the Sydney Metro West – Stage 1 EIS and Modification Report 2 and 5)

Plant community type ID	Plant community type name	Condition class	Area within clearing area (ha)	Stage 1 location	Corresponding threatened ecological community	Determination of PCT to meet the TEC listing
Sydney Metro West Stage 1 EIS						
849	Grey Box-Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Poor (vegetation integrity score 11.4)	0.03	Westmead metro station construction site	Cumberland Plain Woodland in the Sydney Basin Bioregion listed as critically endangered under BC Act. Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, listed under the Commonwealth EPBC Act.	The PCT does not meet the definition for the TEC under the BC Act or the EPBC Act (Biosis 2021).
920[1]	Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion	Poor (vegetation integrity score 34.6)	0.15	Clyde MSF and downstream	None	n/a
Modification 2 Report						
849	Grey Box-Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Poor (vegetation integrity score 14.2)	0.54	Clyde Dive construction site	Cumberland Plain Woodland in the Sydney Basin Bioregion listed as critically endangered under BC Act. Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, listed under the Commonwealth EPBC Act.	The PCT does not meet the definition for the TEC under the BC Act or the EPBC Act (Biosis 2021).
Modification 5 Report						
920[1]	Mangrove Forests in estuaries of the	Moderate	0.40	Clyde MSF and up/downstream	None	n/a

Plant community type ID	Plant community type name	Condition class	Area within clearing area (ha)	Stage 1 location	Corresponding threatened ecological community	Determination of PCT to meet the TEC listing
	Sydney Basin Bioregion and South East Corner Bioregion	(Vegetation integrity score 40.1)				

Source: Jacobs 2020 / Biosis 2021/East Coast Ecology 2023
1. As of December 2023, PCT 920 is now identified as PCT 4091

Figure 2 Westmead vegetation communities as of October 2023

Legend

Clyde Stabling and Maintenance Facility Construction Boundary

Vegetation Communities

849, Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

920, Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion

FIGURE 3

Vegetation Communities (CMSF)

Figure 3 Clyde MSF vegetation communities as of October 2023

5.3 Threatened Flora

A desktop review of databases and published information has generated a list of candidate species, documented in the EIS.

No threatened flora species were recorded during the field surveys conducted for the EIS (Jacobs, 2020). However, the Modification 2 at Clyde Dive identified the removal of 0.14 hectares of Downy Wattle (Biosis, 2021). This includes 0.01 hectares within the approved Project area (as identified in the EIS), as well as 0.13 hectares within an additional area required for construction. Modification 5 required the removal of an additional 0.40 ha of PCT 920, 0.64 ha of Type 1 and 2 KFH, comprising 0.11 ha of mature mangroves and associated pneumatophores/saplings (Type 2) and 0.53ha of coastal wetlands (Type 1). However, this increase will not directly affect species or communities listed under the EPBC Act as confirmed within each respective Modification Report.

The Downy Wattle located within the Clyde MSF (as per the Modification 2 Report) is highly isolated within urban development away from the remainder of the population. Additionally, the habitat within the Clyde MSF consists of largely unviable urban native/exotic planted vegetation and the soil profile within the location of the species has also undergone historic disturbance from construction of the former rail infrastructure, with limited recruitment observed by Biosis.

Biosis concluded that the removal of about 27 stems from a population of at least 4,655 within a 15 km radius of the Clyde MSF would result in the loss of 0.6 per cent of the overall population and is not likely to constitute a significant impact to the species population.

5.4 Threatened Fauna

Targeted threatened fauna surveys were not conducted for the EIS (Jacobs, 2020). Instead, the assessment of threatened fauna surveys was based on the presence of suitable habitat and the findings of previous surveys.

Several threatened fauna species, including birds and Southern Myotis (Myotis macropus) are assumed to be present within the Clyde MSF due to the presence of suitable foraging habitat in the form of Mangrove Forests in estuaries of the Sydney Basin Bioregion and Southeast Corner Bioregion PCT (PCT 920). No potential roosting or breeding habitat was present for Southern Myotis of other threatened species (Clyde MSF Ecological Survey Report, 2023).

Further assessments were conducted for the likelihood of occurrence of all threatened species as part of Modification 5, including a Marine Ecological Assessment (MEA) and a Biodiversity Development Assessment Report (BDAR). 11 aquatic threatened species and/or populations may potentially occur within Clyde MSF. Of these aquatic species three were fish, five were marine reptiles, two were sharks and one marine flora species. No records of sightings of aquatic threatened species were recorded within the study locality. Additionally, the study area does not contain indicative distributions of any listed DPI freshwater threatened fish species (NSW DPI, 2023b). Table 4 identifies the threatened fauna species likely to occur within the project footprint, however, species with a low likelihood of occurrence have been omitted. Habitat locations are illustrated on and .

Table 4: Threatened fauna species likely or assumed to occur within the Project construction sites

Species	BC Act status	EPBC Act status	Location and habitat
Dusky Woodswallow (Artamus cyanopterus cyanopterus)	Vulnerable	Not listed	Commonly recorded near the Parramatta River. May forage in or over the mangroves in and adjacent to the construction sites.
Little Bent-winged Bat (Miniopterus australis)	Vulnerable	Not listed	May forage in and around the mangrove vegetation.
Large Bent-winged Bat (Miniopterus orianae oceanensis)	Vulnerable	Not listed	May forage in and around the mangrove vegetation.
Eastern Coastal Free-tailed Bat (Micronomus norfolkensis)	Vulnerable	Not listed	May forage in and around the mangrove vegetation. Potential roosting habitat present throughout mangroves.
Grey-headed Flying-fox (Pteropus poliocephalus)	Vulnerable	Not listed	Recorded in urban areas of Sydney. Some foraging habitat may be impacted (street trees, garden plantings and mangroves). No camps were recorded within the construction sites, however the nearest camp is located on Duck River approximately 800 m to the south-west of the Clyde MSF construction site.
Little Lorikeet (Glossopsitta pusilla)	Vulnerable	Not listed	May forage in street trees within the construction sites on occasion.
Swift Parrot (Lathamus discolor)	Endangered	Critically endangered	Vagrant birds are known to occasionally visit the street trees around the Sydney urban area but the likelihood of birds using the trees within the footprint as a continual source of habitat is low (Jacobs, 2020).
Southern Myotis (Myotis macropus)	Vulnerable	Not listed	Foraging habitat present (mangrove veg and Duck River). No roosting or breeding habitat was recorded during the EIS field surveys.
Above tunnel alignment and within surrounding GDEs			
Australasian Bittern (Botaurus poiciloptilus)	Endangered	Endangered	Habitat present in saltmarsh downstream of the Clyde MSF construction site and in Mason Park wetlands located above the tunnels.

Species	BC Act status	EPBC Act status	Location and habitat
Green and Golden Bell Frog (Litoria aurea)	Endangered	Vulnerable	Habitat present in wetlands of Haslams Creek that are located above the tunnels. Wetlands around Sydney Olympic Park (outside construction sites)

5.4.1 Hollow-bearing Trees

No large tree hollows (size classes were not defined within the EIS) were recorded during the field surveys for the EIS (Jacobs, 2020). However, small tree hollows were acknowledged as potentially occurring. For the purposes of this FFMP, a small hollow is defined as having an opening between 5-10 cm across.

Figure 4 Threatened biodiversity at Westmead

Figure 5 Threatened biodiversity at Clyde MSF

5.5 Migratory and Marine Fauna Species

Table 5 identifies the migratory bird species that were assessed with a moderate likelihood of occurring in the Project construction sites (Jacobs, 2020). No important habitat for any of these species was identified within the Project construction sites.

Table 5: Migratory species with a moderate likelihood of occurring in the Project construction sites

Listing	Species
Migratory marine	Apus pacificus (Fork-tailed Swift)
Migratory terrestrial	Hirundapus caudacutus (White-throated Needletail)
Migratory wetland	Actitis hypoleucos (Common Sandpiper)
Migratory wetland	Arenaria interpres (Ruddy Turnstone)
Migratory wetland	Calidris acuminata (Sharp-tailed Sandpiper)
Migratory wetland	Calidris ferruginea (Curlew Sandpiper)
Migratory wetland	Calidris melanotos (Pectoral Sandpiper)
Migratory wetland	Calidris ruficollis (Red-necked Stint)
Migratory wetland	Calidris tenuirostris (Great Knot)
Migratory wetland	Charadrius bicinctus (Double-banded Plover)
Migratory wetland	Charadrius leschenaultii (Greater Sand Plover)
Migratory wetland	Charadrius mongolus (Lesser Sand Plover)
Migratory wetland	Charadrius mongolus (Latham's Snipe)
Migratory wetland	Limosa lapponica (Bar-tailed Godwit)
Migratory wetland	Limosa (Black-tailed Godwit)
Migratory wetland	Numenius madagascariensis (Eastern Curlew)
Migratory wetland	Numenius phaeopus (Whimbrel)
Migratory wetland	Pandion cristatus (Osprey)
Migratory wetland	Pluvialis fulva (Pacific Golden Plover)
Migratory wetland	Tringa brevipes (Grey-tailed Tattler)
Migratory wetland	Tringa nebularia (Common Greenshank)
Migratory wetland	Tringa stagnatilis (Marsh Sandpiper)

5.6 Groundwater Dependent Ecosystems

The EIS Technical Paper 10 (Biodiversity development assessment report) identifies all potential groundwater dependent ecosystems (GDEs) located in proximity to (about 1.5 km of) the Stage 1 construction sites and tunnel.

Additional investigations and assessment of potential impacts to GDEs would be carried out in accordance with REMM B3, as detailed in Section 7.1.

No aquatic groundwater dependent ecosystems (GDEs) have been mapped within a 1,500 m buffer of the Project construction sites (Bureau of Meteorology, 2017). The Atlas of GDEs does however map terrestrial GDEs within the locality (a 10 km buffer around the Project construction

sites) that have the potential to be impacted by drawdown caused by station and shaft excavations (Jacobs, 2020).

Table 6 identifies the PCT / terrestrial GDE relationships within close proximity to the Project construction sites that may be impacted by the groundwater drawdown associated with the proposed excavations for the project.

shows the location of GDEs within close proximity to Project construction sites.

Table 6: GDEs within proximity to Project construction sites

PCT/GDE relationship	Location
PCT 849: Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	• Approximately 20 m north of the Westmead metro station construction site • In Parramatta Park approximately 200 m east of the Westmead metro station construction site.
PCT 835: Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	• Toongabbie Creek - approximately 1.2 km north-west of the Westmead metro station construction site. • Domain Creek in Parramatta Park - approximately 350 m east of the Westmead metro station construction site. • Parramatta River at two locations - approximately 650 m east of the Westmead metro station construction site and approximately 360 m north-west of the Parramatta metro station construction site.
PCT 1800: Swamp Oak open forest on riverflats of the Cumberland Plain and Hunter valley	• Toongabbie Creek at two locations near the Westmead Metro Construction Site - one approximately 1.2 km north-west and the other 1 km to the north. • Finlaysons Creek - approximately 1 km north-west of the Westmead metro station construction site. • Immediately west of Mother Teresa Primary School at Westmead - approximately 500 m north-west of the Westmead metro station construction site. • Along Parramatta River approximately 460 m north-west of the Parramatta metro station construction site.

Source: Jacobs 2020

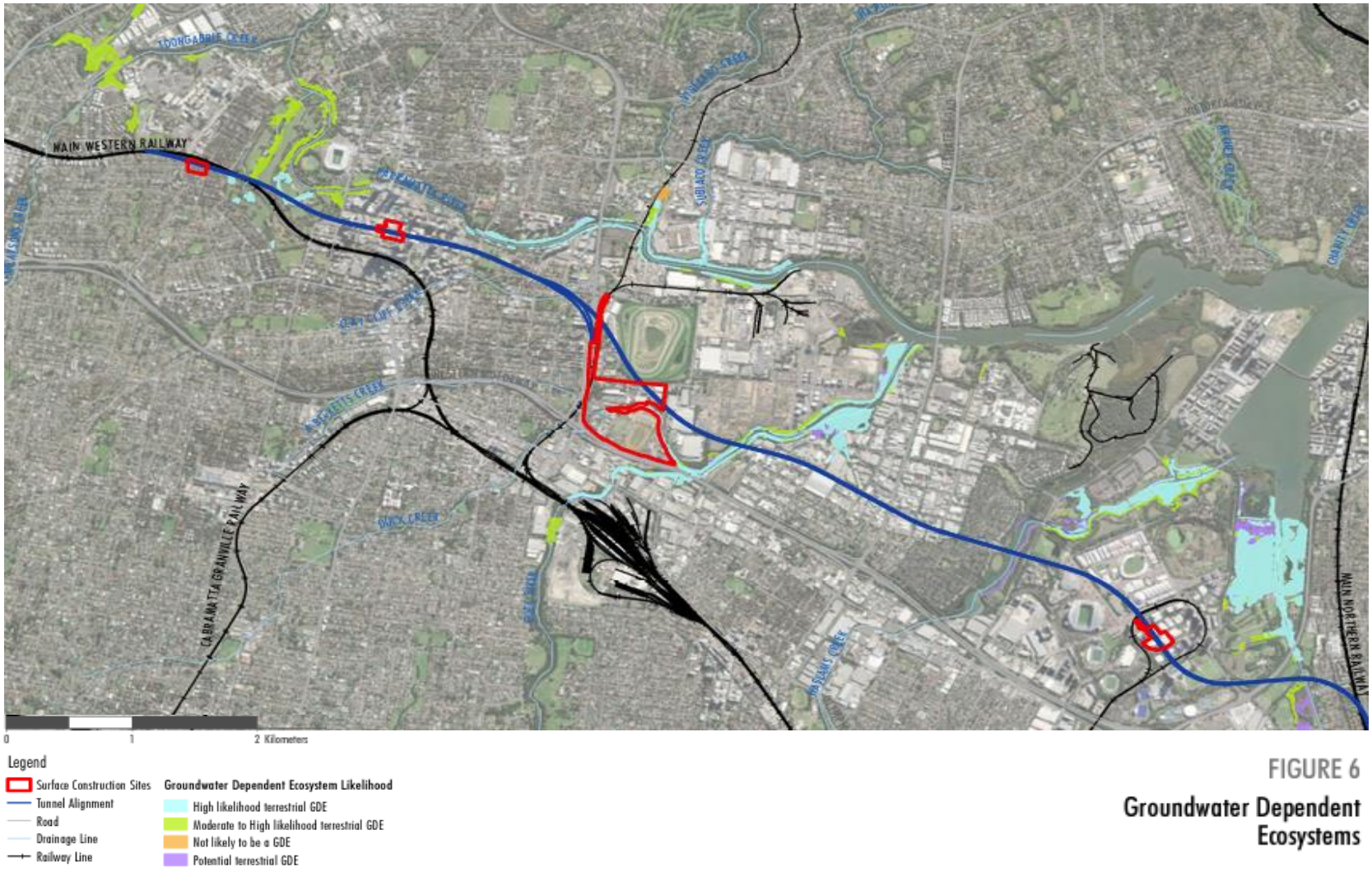


Figure 6 Groundwater dependent ecosystems

5.7 Aquatic Biodiversity

5.7.1 Key Watercourses

Table 7 identifies watercourses within or close to the Project construction sites mapped as either key fish habitat or SEPP (Coastal Management) wetland.

Table 7: Key watercourses within or close to the Project construction sites

Watercourse	Description	Key fish habitat	SEPP (Coastal Management) wetland	Impact*
Toongabbie Creek	Third order stream approximately 1.2 km north-west of Westmead Metro Station	Yes	No	Unlikely to be impacted
Darling Mills Creek	Fourth order creek approximately 1.5 km northeast of Westmead Metro Station	Yes	No	Unlikely to be impacted
Parramatta River	Main tributary of Sydney Harbour. Parramatta Metro Station is approximately 300 m south.	Yes	Yes	Potential impacts from construction water discharges without mitigation
Clay Cliff Creek	Second order creek. Tunnels will pass approximately 35 m beneath the creek.	No	Yes	Unlikely to be impacted
Subiaco Creek	Second order watercourse about 1.4 km north of the Clyde MSF	Yes	No	Unlikely
Duck River	Third order estuarine waterway within the study area. Tunnels will	Yes	Yes	Potential impacts from construction water discharges without mitigation

Watercourse	Description	Key fish habitat	SEPP (Coastal Management) wetland	Impact*
	pass 30 m beneath.			
Duck Creek	Second order stream located within and adjacent to the Clyde MSF construction site	Yes	Yes	Yes
A'Becketts Creek	Second order stream located within and adjacent to the Clyde MSF construction site	No	Yes	Yes
Haslams Creek	Second order stream. Tunnels pass about 30 m beneath	Yes	Yes	Potential impacts from construction water discharges without mitigation
Saleyards Creek	First order stream. Tunnels pass about 25 m beneath	Yes	Yes	Unlikely

*As assessed by Jacobs (2020) in the EIS biodiversity assessment

5.8 Marine Vegetation

Marine vegetation is protected under the Fisheries Management (FM) Act 1994. Within the Clyde MSF construction site, mangrove vegetation and coastal wetlands are present along Duck Creek and A'Becketts Creek. Section 5.23 1 (b) of the EP&A Act exempts SSI from a range of approval requirements, including permits under of the FM Act 1994. No additional permits are therefore required for the removal of marine vegetation (including mangroves) that have been already approved as part of this Project.

5.9 Aquatic Fauna

The known aquatic ecology of the Parramatta River is limited to a few publicly available historical fish surveys, and no threatened aquatic species have been recorded. The EIS, desktop searches indicate that three threatened aquatic species with a moderate or higher likelihood of occurring in the locality; Black Rockcod (Epinephelus daemelii), White Shark (Carcharadon carcharias) and Grey Nurse Shark (Carcharias taurus). These species are have a low likelihood of occurence within the construction sites considered within this FFMP. Threatened marine species have been identified in Section 5.4.

5.10 Weed Species

Weeds and exotic flora species were frequently recorded throughout the Project. A full list of the recorded weed and exotic flora species is available in Appendix B of the EIS Biodiversity Development Assessment Report (BDAR). Table 8 below identifies priority weeds for the Greater Sydney Area and weeds of national significance. These species will be the most difficult and important to manage.

Table 8: Priority weed species for the Greater Sydney Region and Weeds of National Significance recorded within Project construction sites

Weed species	Priority weed	Weed of National Significance	Construction site	Location
Anredera cordifolia (Madeira Vine)	Yes	Yes	Clyde MSF	Duck Creek
Arundo donax (Giant Reed)	Yes	-	Clyde MSF	Duck Creek
Asparagus scandens (Asparagus Fern)	Yes	-	Clyde MSF	A'Becketts Creek
Cestrum parqui (Green Cestrum)	Yes	-	Clyde MSF	A'Becketts Creek
Lantana camara (Lantana)	Yes	Yes	Clyde MSF	A'Becketts Creek

5.11 Summary

A summary of the biodiversity values within the sites considered within this FFMP is detailed within Table 9.

Table 9: Summary of biodiversity values

Location (inclusive of connecting tunnels)	Recorded Biodiversity	Site Status
Sydney Olympic Park Metro Station	• Groundwater dependent ecosystems (outside construction boundary) Planted native vegetation	• No vegetation clearing is required for the Project works.
Clyde MSF / Rosehill Services Facility	• Groundwater dependent ecosystems (within and outside construction boundary) • Aquatic/marine ecology • Weeds and exotic vegetation • Planted native vegetation • PCT 920 Mangrove Forests in estuaries of the Sydney Basin Bioregion and Southeast Corner Bioregion • Myotis macropus (Southern Myotis) • Acacia pubescens (Downy Wattle)	• The Demolitions Contractor has demolished several structures and cleared vegetation in the northern section of Clyde MSF (along Unwin Street) • Vegetation removal is required at the Clyde site • Instream works is required at Duck Creek / A'Becketts Creek.
Parramatta Metro Station	• Groundwater dependent ecosystems (outside construction boundary)	• There are no trees within the construction boundary. • The Demolitions Contractor has demolished the majority of buildings within the construction boundary.
Westmead Metro Station	• Groundwater dependent ecosystems (within and outside construction boundary) • Weeds and exotic vegetation • Planted native vegetation.	• The site has been cleared of all vegetation by the Demolitions Contractor prior to handover to GLC.

6 ASPECTS AND IMPACTS

6.1 Construction Activities

The construction phase of the Project has the potential to impact biodiversity values which cannot be avoided. This would occur through direct and indirect impacts.

Construction activities with the potential to impact on flora and fauna during construction may include:

- Site establishment activities
- Removal and trimming of vegetation and trees, including street trees
- Demolition of existing structures
- Realignment of Duck Creek and A'Becketts Creek, Clyde (to be partly enclosed in proposed culverts and remainder to be retained as a naturalised channel)
- Set up and use of material, plant and spoil storage areas during construction
- Movement of vehicles and plants to and from the construction site
- The use of machinery and equipment such as mobile cranes, excavators, concrete pumps, piling rigs
- Introduction of car parks, acoustic sheds, spoil sheds, laydown areas, workshops, dangerous goods storage, wheel wash, site offices and staff amenities during construction
- Adjustment of road networks
- Noise barriers and hoardings
- Construction of open dive structures
- General earthworks
- Operation of construction lighting during night-time construction works.

6.2 Impacts

Direct impacts to biodiversity values include clearing of native vegetation, clearing of suitable habitat for threatened and protected flora and fauna species, and the installation of infrastructure. Indirect impacts to biodiversity values include ground water drawdown, soil and water contamination, shading of areas via introduction of new infrastructures, creation of barriers to fauna movement or the generation of excessive dust, light or noise upon the surrounding environment.

Table 10 details the type, frequency, intensity, duration and consequence of the direct and indirect impacts to biodiversity values that may occur as a result of the Project. Impacts to biodiversity are described in detail in the EIS BDAR (Jacobs, 2020), Clyde MSF BDAR (East Coast Ecology, 2023), and the Marine Ecological Assessment (Stantec Australia, 2023).

Table 10: Summary of impacts within the Project construction sites

Location	Impacts
Sydney Olympic Park Metro Station	• Potential spread of weeds and exotic flora species • Potential spread of plant pathogens and disease
Clyde MSF	• Direct clearing of 0.55 hectares of PCT 920 • Direct clearing of 0.54 hectares of PCT 849 including direct impact to 0.14 hectares of clearing of Acacia pubescens (Downy Wattle) • Direct impacts to Myotis macropus (Southern Myotis) habitat • Direct impact to potential threatened bird and microbat foraging habitat • Direct impacts to GDEs (PCT 920) • Potential impacts to GDEs outside the construction boundary • Impacts to key fish habitat • Potential spread of weeds and exotic flora species • Potential spread of plant pathogens and disease
Parramatta Metro Station	N/A
Westmead Metro Station	• Potential impacts to GDEs outside the construction boundary • Potential spread of weeds and exotic species • Potential spread of plant pathogens and disease
Tunnelling	• Potential impacts to key fish habitat • Potential impacts to GDEs overlying tunnel alignment

Section 7 of this plan provides mitigation and management measures that will be implemented to avoid or minimise fauna and flora impacts during the delivery of the Project.

It is important to note that the EIS BDAR states that 'indirect impacts such as those from groundwater drawdown are not expected to impact the habitat of threatened species based on groundwater modelling as detailed in Technical Paper 7 (Hydrogeology)'. A revised Groundwater Modelling Report will be prepared in accordance with MCoA D122 to assess the groundwater level drawdown effects from the Project. Refer to the Groundwater Management Sub-plan for more information.

Groundwater drawdown was identified as potentially impacting the following TECs within and outside the Project construction sites:

- Cumberland Plain Woodland in the Sydney Basin Bioregion (BC Act) (mapped as equivalent to Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (EPBC Act))
- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act)
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act) (mapped as equivalent to Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community (EPBC Act))
- Sydney Turpentine-Ironbark Forest (BC Act) (mapped as equivalent to Turpentine-Ironbark Forest of the Sydney Basin Bioregion (EPBC Act)).

Any impacts to these TECs from groundwater drawdown are likely to be minimal (Jacobs, 2020).

7 ENVIRONMENTAL MITIGATION AND MANAGEMENT MEASURES

Measures to manage flora and fauna impacts and reduce the risk of impact to species, communities and habitats will be implemented throughout the Project.

7.1 Standard Mitigation and Management Measures

Specific measures and requirements to meet the objectives of this Plan and to address impacts on flora and fauna are outlined in Table 11. These measures have been developed in line with the requirements in the EIS. As a minimum, the following will be incorporated at each construction site and documented on the Environmental Controls Map (ECM) in Attachment 8 of the CEMP, where applicable.

Table 11: Environmental Mitigation and Management Measures

Item	Mitigation and Management Measure and Project site requirements	Responsibility	Timing	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist				
	General Controls			
1.	All site staff, including subcontractors must attend an induction which details mitigation measures relevant to this flora and weed management procedure. Flora management will be further communicated in toolbox talks and prestart briefings. Environmental Control Maps will include mitigation measures for flora and fauna.	EA	Pre-construction and during construction	MCoA C1, C6, C-B8 and C11
2.	Appropriate erosion and sediment controls are to be installed in accordance with the requirements of the Blue Book (Landcom, 2004) and the Soil and Water Management Sub-Plan (SWMP) to minimise impacts to the receiving environment, including the implementation of an Erosion and Sediment Control Plan (ESCP).	EA/CM/SS	Pre-construction	MCoA C-B10, C1 and C6 REMM B1 and B3
3.	Any work required outside of the approved clearing area identified in the EIS will be referred to the Environmental Manager for advice on further assessment and approval requirements.	EA/CM	During construction	MCoA D3
5.	Environmentally sensitive areas will be fenced off and signposted for the duration of the Project construction, including all waterways' areas in or adjacent to the site which are excluded from the work areas.	EA/CM/SS	During construction	MCoA C11, D3 and D9 REMM B1
6.	Where possible, construction activities would minimise disturbance to waterways and riparian land, through site fencing and signage. Stockpile areas and storage areas would be located away from waterways and riparian land, where feasible.	EA/CM/SS	During construction	MCoA C B8, C11 and D9 REMM B1 B2 and B5
7.	All plant and equipment would remain on haulage roads and paved surfaces as much as possible, so as to minimise damage to vegetation.	CM/SS	During construction	MCoA C11, D2 and D9
8.	Equipment storage areas and stockpile areas are to be located in cleared areas and not within drip zones of trees.	CM/SS	During construction	MCoA C11, D2 and D9

Item	Mitigation and Management Measure and Project site requirements	Responsibility	Timing	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist				
9.	Stockpiling/storage of cleared timber is to be in designated areas and outside the tree protection zone of remaining trees.	CM/SS/PE	Pre-construction and during construction	MCoA C11, D2 and D9
10.	The site induction will include information on site speed limits to ensure all personnel obey the speed limit when operating heavy machinery and vehicles. This will be emphasised for areas where vehicle/fauna interactions are identified as high risk.	EA	During construction	MCoA C6 and C11
11.	Weekly site inspections to ensure environmental controls to minimise noise, vibration, light and dust are in place at all compound sites, particularly compounds operating on a 24-hour basis.	SEA	During construction	MCoA C11
12.	Use of low sodium and / or directional lighting to avoid light spill into adjacent habitat areas, in order to avoid impacting on sensitive fauna.	CM/SS	During construction	MCoA C11
13.	Use of acoustic shed for some construction activities to minimise noise and dust impacts.	CM	During construction	MCoA C11
	Weed Control and Management			
14.	Use of herbicides would be in accordance with the Pesticides Act 1999, other relevant legislation, label directions and any relevant industry codes of practice.	EA/SS	During construction and post construction	MCoA C6 and C11
15.	All herbicide applications will be undertaken with consideration to the New South Wales Weed Control Handbook – A guide to weed control in non-crop, aquatic and bushland situations (DPE, 2018)	EA/SS	During construction and post construction	MCoA C6 and C11
16.	Herbicides will not be applied: When plants are stressed on hot days After seed has been set Within 24 hrs of rain or when rain is imminent	EA/SS	During construction and post construction	MCoA C6 and C11

Item	Mitigation and Management Measure and Project site requirements	Responsibility	Timing	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist				
	During windy conditions when the use of herbicides may affect non-targeted areas.			
	Vegetation Clearing (including work impacting Aquatic Environments)			
17.	During detailed construction design, clearing of native vegetation will be minimised to the greatest extent practicable with the objective of reducing impacts to threatened ecological communities and threatened species habitat, through investigating opportunities to revise the construction site boundary and location of construction elements.	SEA/CM	Pre-construction and during construction	MCoA C B8, D2, D3, D6A and D9
18.	Tree and urban canopy clearing would be avoided where possible.	EA/CM/SS	During construction and post-construction	MCoA C6 and C11
19.	Canopy trimming would be considered where practicable prior to any mature tree removal.	EA/CM/SS	During construction and post-construction	MCoA C6 and C11
20.	Prior to any disturbance, clearing or grubbing activities in any locations the following will be in place: • a Pre-Clearing Inspection Checklist (GA-FRM-HSE-149) will be completed • A Permit to Clear (GA-FRM-HSE-150) will be issued • No-go Zones for significant flora and fauna, fenced/flagged and sign posted prior to commencement of clearing in accordance with the Pre-Clearing Inspection Checklist; and • A suitably qualified ecologist will conduct a search for any wildlife that may need to be removed and relocated where the Pre-clearing Inspection Checklist specifies. This ecologist pre-clearance inspection will occur within 48 hours of clearing.	EA/CM/SS/PE	During construction	MCoA C6, C11 and D6A REMM B10

Item	Mitigation and Management Measure and Project site requirements	Responsibility	Timing	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist				
21.	If grubbing is to be undertaken, then sediment and erosion controls must be in place (refer to SWMP) prior to grubbing to ensure that sediment laden water does not run off site.	EA/CM/SS	Pre-construction and during construction	MCoA C6 and C11
22.	Tree removal/clearing will be undertaken by a suitably qualified person.	SEA/CM/PE	During construction	MCoA C11
23.	An Arborist will be present onsite when excavation works are required to encroach more than 10% of the tree protection zone of native vegetation.	PE	During construction	MCoA C11 and D9
24.	Non-structural roots would be pruned by a clean diagonal cut and not exposed to air for more than 24 hours. The Project Arborist is responsible for undertaking the cutting of roots, or overseeing the cutting of roots when appropriate.	SEA/CM/SS/PE	During construction	MCoA C11 and D9
25.	Cleared/removed weed-free vegetation will be used either on or off the Project where possible (e.g. for habitat, chipped for mulch and reused).	CM/SS	During construction and post-construction	MCoA C11 and D9, REMM B7, B8
26.	Any disposal of excess mulch and/or weeds will be in accordance with the Waste Management Plan and take into account the Raw Mulch Exemption and Order (EPA 2014).	CM/SS	During construction and post-construction	MCoA C11 and D9
	Site Restoration			
27.	A Landscaping or Revegetation Plan will be prepared by Sydney Metro to rehabilitate and / or renaturalise parts of Duck Creek and A'Becketts Creek that remain open channels at the Clyde MSF site. The plan would be implemented before operation of the Project commences.	SEA/PE	During construction and post-construction	MCoA C B10 REMM B2 and B6
28.	In areas that are within the tidal limits of Duck Creek and A'Becketts Creek only species that are representative of PCT 920 (Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion) are to be used in the revegetation. Elsewhere, revegetation must use species that are	SEA/PE	During construction and post-construction	MCoA C B10 REMM B2 and B8

Item	Mitigation and Management Measure and Project site requirements	Responsibility	Timing	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist				
	representative of the most appropriate plant community type in each location, depending on levels of inundation, salinity levels, and elevation as determined by an ecologist. Note: The most appropriate PCT may include the following: 1234, 1136, 781, 1808, 849, and 1800.			
29.	The Landscaping Plan for Clyde MSF (to be prepared by Sydney Metro) will be consistent with the DPI (2012) Guidelines for Vegetation Management Plans on Waterfront Land.	SEA	Post-construction	MCoA C B10 and C11
	Fauna Management			
30.	Before the removal or clearing of any vegetation, or the demolition of structures identified as potential roosting sites for microbats at the Clyde MSF site commences, pre-clearing inspections for the threatened species would be undertaken in accordance with the Pre-Clearing Inspection Checklist (GA-FRM-HSE-149).	EA/CM/SS/PE	Pre-construction and during construction	MCoA D7
31.	The inspections, and any subsequent survey and or relocation of fauna and associated management / offset measures, would be undertaken under the guidance of the Project Ecologist. Survey and relocation methodologies and management / offset measures are included in this FFMP, refer Section 7.6.	PE	Pre-construction and during construction	MCoA D7
32.	In the event microbat roosting sites have been identified in Mitigation and Management Measure 30 and 31 survey will be undertaken to determine what species is present (as per Section 7.6). Bat boxes will be installed, or suitable habitat built within the Clyde MSF.	EA/CM/SS/PE	Pre-construction and during construction	MCoA D8
33.	Bridges and culverts to be disturbed by construction activities will be checked for roosting bats within 48 hours prior to commencement of the works, including the temporary bridge at Clyde MSF.	EA/PE/SS	During construction	MCoA C11 and D7
34.	If a threat to an animal is evident onsite, the Site Supervisor and/or Project Ecologist would be notified immediately. Works may need to cease if the animal is in danger or harmed until it has been relocated.	SS/PE	During construction	MCoA C6, C11 and D7
	Fish Passage			

Item	Mitigation and Management Measure and Project site requirements	Responsibility	Timing	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist				
35.	During construction, works in and around waterways would be avoided, where practicable, to allow sufficient flow and fish passage similar to current conditions. Any in-stream works would ensure sufficient flow and fish passage, by minimising sediment disturbance and physical blocking (including large machinery).	SEA/CM/SS	During construction	REMM B1 and B5
36.	The A'Becketts Creek and Duck Creek crossings would be designed to: • Provide sufficient fish passage in accordance with Sydney Metro Environment and Sustainability Policy and guidelines for fish habitat conservation and management Update 2013 (DPI Fisheries NSW, 2013). • Incorporate suitable scour protection. • Avoid worsening existing flow velocities downstream from the crossing locations, through implementing Mitigation and Management Measure 35. • Incorporate a vegetated riparian zone within the realigned open channel sections, where feasible and reasonable, in the Landscaping or Revegetation Plan (to be prepared by Sydney Metro).	SEA/CM/SS/PE	Pre-construction	REMM B2 and B5
	Groundwater Dependent Ecosystems			
37.	Additional investigations and assessment would be completed to confirm the potential for impacts to groundwater dependent ecosystems due to groundwater drawdown, and to identify any required mitigation through design. This will be through a revised Groundwater Modelling Report in the Groundwater Management Sub-plan.	SEA	During construction and post-construction	REMM B3 MCoA D122
	Unexpected Species Finds			
38.	An unexpected discovery procedure for threatened flora and fauna species will be implemented to ensure that if flora or fauna are found, they are removed from the area to be cleared. Refer to Section 7.8 for the procedure.	SEA/SS/PE	During construction	MCoA C11
	No-go Zones			

Item	Mitigation and Management Measure and Project site requirements	Responsibility	Timing	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist				
39.	Exclusion zones and no-go zones would be implemented in accordance with Section 7.5. No-go zones would be obeyed at all times without a Permit to Enter a 'No-go Zone' (GA-FRM-HSE-151). Any damage to no-go zone fencing or signage would be reported to the Site Supervisor or Environmental Advisor immediately.	EA/SS	During construction	MCoA C6 and C11
40.	Establish and mark vegetation buffer zones in areas of vegetation removal in riparian zones.	EA/SEA/SS	Pre-construction and during construction	REMM B10
	Monitoring			
41.	Visual monitoring of flora and fauna will occur during environmental inspections. Any flora and fauna issues will be recorded in the Environment and Sustainability Inspection (refer to Attachment 6 of the CEMP).	EA	During construction and post-construction	MCoA C6 and C11
	Vehicle and Equipment Hygiene			
42.	Vehicle Plant and Equipment Movement Vehicle hygiene procedures will be implemented in accordance with Section 7.9.1, including washdown and inspection of vehicles and equipment entering the construction sites.	EA/CM/SS	During construction	MCoA C6 and C11
43	• To avoid the spread of weeds, pests and pathogens during construction works within Duck Creek and A'Becketts Creek: machinery, silt curtains and other plant and equipment that may facilitate the spread of Caulerpa or other pests would be washed down with fresh water and inspected for fragments before entering site.	SEA/EA/SS	Pre-construction and during construction	REMM B9

Item	Mitigation and Management Measure and Project site requirements	Responsibility	Timing	Reference
SEA – Senior Environmental Advisor, EA – Environmental Advisor, CM – Construction Manager, SS – Site Supervisor, PE – Project Ecologist				
	• occurrence of any pests must be reported to NSW DPI Fisheries.			
	Animal Handling			
44.	Should fauna be observed on the Project construction site during vegetation clearing activities, the Animal Handling Procedure in Section 7.7 of this Plan will be followed.	CM/SS/EA/PE	During construction	MCoA C6 and C11
	Pruning			
45.	Appropriate tools would be used for pruning of vegetation, including loppers, chainsaws and vehicle mounted saws.	EA/CM/SS	During construction	MCoA C6 and C11

7.2 Environmental Control Maps

ECMs have been prepared for each construction site, which outline the location of protection measures, monitoring requirements, environmental obligations and environmentally sensitive areas (refer to Attachment 8 of the CEMP). It is the practical application of the proposed control measures and an important tool to communicate these to all personnel including subcontractors.

ECM's will be site specific and updated to reflect the unique risks and challenges of the site to which they relate. Flora and fauna control measures that may be identified within each ECM may include:

- Location of No-go Zones and requirements for working within No-go Zones
- Location of Southern Myotis habitat, Mangrove Swamps and waterways
- Weed control procedures
- Vegetation clearing and pruning procedures
- Stockpiling and storage management
- Vehicle, Plant and Equipment Movement hygiene procedures.

7.3 Site Specific Mitigation Measures

Table 12 identifies the mitigation and management measures to be implemented to satisfy the CoA, CEMF and REMMs. Further detail of each management measure is provided in Section 7.2 to Section 7.10.

Table 12: Standard mitigation and management measures

Construction site	Mitigation and management measures to be considered
Sydney Olympic Park Metro Station	• Weed and exotic species control and management • Plant pathogen and disease management • Fauna management protocols
Clyde MSF	• Consideration of seed collection and vegetation reuse • Pre-clearing surveys • Vegetation retention zones • No-go zones • Weed and exotic species control and management • Plant pathogen and disease management • Erosion and sediment control • Fauna management protocols • Platform/temporary wharfs in place of weirs for instream works. • Floating booms and silt curtains during creek works.
Parramatta Metro Station	• Weed and exotic species control and management • Plant pathogen and disease management • Erosion and sediment control • Fauna management protocols
Westmead Metro Station	• No-go zones • Weed and exotic species control and management

Construction site	Mitigation and management measures to be considered
	• Plant pathogen and disease management • Erosion and sediment control • Fauna management protocols

7.4 Vegetation Clearance

All vegetation clearance procedures and activities will be managed and implemented by the Site Supervisor, the Environment team, and the Project Ecologist (as required) during construction phases of the development.

The pre-clearing procedures will be implemented where clearing is required. Within the clearing boundary, native vegetation should be retained where possible to meet the requirements of CoA C-B8, D2 and D9. No vegetation clearing is to occur within Vegetation Retention Zones (Section 8.2.1).

Trees that are required to be cleared are to be replaced with species that are locally native, urban-resilient, and are likely to provide native fauna habitat and foraging value. Trees will be replaced at a ratio of 2:1 while also achieving a net increase in overall canopy cover (CoA C-B8 and C-B9). This will be undertaken by another Contractor on behalf of Sydney Metro and is not included as part of the scope covered by this Plan.

Impacts to PCTs will not exceed those identified in the documents listed in MCoA A1, unless otherwise approved by the Planning Secretary. In requesting the Planning Secretary's approval, an assessment of the additional impacts(s) to PCTs and an updated ecosystem and / or species credit requirement under MCoA D4, if required, will be provided.

The following process will be followed to minimise the area of disturbance and the amount of vegetation to be cleared for the development:

- Where opportunity exists, utilise smaller more precise plant and equipment during vegetation clearing and removal to reduce likelihood of collateral damage to retained vegetation.
- If the vegetation to be cleared is adjacent to vegetation that is not to be disturbed then delineate an exclusion zone around the vegetation that is to be retained using fencing, flags, rope and 'no-go zone' signage.
- In the context of vegetation clearance in riparian zones: ensure there is a vegetation buffer zone in place.
- Check the vegetation to be cleared for hollows, rocky areas, or fauna habitat. If hollows, rocky areas, or fauna habitat are present refer to the hollow bearing tree/habitat removal procedure in Section 7.4.4.
- If sufficient, prune the minimal amount of branches and foliage instead of clearing it. Proceed to the next step if pruning is not sufficient and the clearing of vegetation needs to occur
- Clear the vegetation and move it to an approved area.

7.4.1 Seed Collection and Vegetation Reuse

Within the Clyde MSF, consideration will be given to seed collection plant propagation program, translocation of juvenile and mature native plants and the reuse or relocation of vegetation such as large woody debris, in accordance with REMM B4, B7 and B8. Consistent with discussions with Sydney Metro and the ER, review and advice has been submitted separately to this FFMP (Umwelt, July 2022) to meet the requirements of the condition. GLC are currently working with

Sydney Metro and the ER to ensure the appropriate implementation of this condition on the Clyde MSF site. This will include further consideration of the feasibility to translocate Acacia pubescens from the site.

7.4.2 Pre-clearing Inspection Procedure

Pre-clearance survey will be carried out and the Pre-Clearing Inspection Checklist (GA-FRM-HSE-149) completed by an ecologist (in the context of native vegetation) and the Environmental Manager or delegate, refer to Attachment 4. The Pre-clearing Procedure is focused on identifying areas of ecological risk and the actions or measures to be implemented to minimise the ecological impacts to biodiversity values. Figures showing threatened species polygons and records, and the distribution of threatened ecological communities in the Project construction sites are shown in Section 5 of this FFMP.

The following inspections will be carried out as part of the Pre-Clearing Inspection before any clearing activities have begun:

- Has the vegetation to be cleared been clearly delineated? Are all trees / vegetation to be retained identified and No-Go Areas fenced off? Have any habitat trees been identified and appropriately marked?
- Is there risk of weed infestation or spread?
- Are there hollow-bearing trees or other habitat features such as buildings?
- Were any animals observed? Are any active nests present? If soil disturbance is to occur, have ESCPs been implemented?
- Have all equipment operators been shown limit of clearing, advised of fauna handling procedures, and any other controls?
- What is the physical demarcation of the limit of clearing?
- Are the proposed works covered by an existing Approval?

The results of these surveys will be provided to the construction personnel involved in vegetation clearing, through site inductions, toolbox talks and targeted training. Additionally, the need for an ecological inspection to be undertaken within 48 hours of clearing will be identified.

The completion of the Pre-Clearing Inspection will form a Hold Point requiring sign-off from the Environmental Manager or delegate.

7.4.3 Permit to Clear Procedure

After a Pre-Clearing Inspection Checklist has been completed, prior to any vegetation clearing, a Permit to Clear (GA-FRM-HSE-150) is to be acquired, refer to Attachment 3. The Permit to Clear procedure is designed to:

- Provide a hold-point to ensure the development is being undertaken in accordance with the approved clearance limits for the development
- Minimise the impact of the development on TECs, flora, fauna and their habitat by reducing impacts to native vegetation from clearing activities.

The following process is to be completed by the Construction Manager (and endorsed by the Environment Manager or delegate) to obtain a Permit to Clear:

1. Identify the location that is planned for clearing.
2. Confirm that the clearing activities are within the approved clearance boundaries for development.

3. Confirm if the clearing activities will contribute to the approved clearance limits for the development and that they will not be exceeded. In circumstances where clearing is trending towards its disturbance limit; it is the responsibility of the Environment Manager (or delegate) to provide internal guidance to the Site Supervisor to ensure that limits are not exceeded. If an exceedance does occur, the Site Supervisor will notify the Environmental Manager who will then advise the relevant agencies to determine corrective procedures.
4. Identify if timing constraints for threatened species are applicable when undertaking this work, i.e. are the clearing activities occurring during the critical life cycle events (breeding or nursing times) for the threatened species that were identified or assumed as being present within the Project construction sites (see Section 5.4). If so, the procedures presented in this section, as well as Sections 7.5, 7.6, 7.7 and 7.8 are to be known and implemented by those undertaking clearing activities.
5. Where there are ecological sensitives (for example if habitat features were identified in the Pre-Clearance Inspection Checklist), have the Project Ecologist undertake a site survey within 48 hours to confirm no potential direct impact to fauna. Identify the need to relocate any fauna in accordance with this Plan and identify if the Project Ecologist needs to be onsite during vegetation clearing activities.

Where vegetation is to be cleared, the Environment Manager (or delegate) is responsible for ensuring the following measures are implemented:

- The Permit to Clear procedure described above has been implemented.
- The procedures presented in this section, as well as Sections 7.5, 7.6, 7.7 and 7.8 have been communicated to those undertaking clearing activities and are being implemented.
- Photos, as-built records, and inspection records which documents the above are held for the life of the development's consent.

7.4.4 Vegetation Clearing Procedure

Where identified during a pre-clearing ecology survey (undertaken as part of the Permit to Clear procedure above) or if explicitly mentioned in a CoA or REMM, a qualified ecologist will be on-site during vegetation clearing activities.

7.4.4.1 Habitat trees or Hollow bearing trees

Hollow bearing trees are an important habitat feature for a variety of native animals. Before clearing any hollow bearing or habitat trees, it is important to consider if animals are present. Where practicable, hollow bearing trees should not be removed when breeding is at its peak for threatened species recorded or assumed to be present within the Project construction sites. The following process will be followed to ensure no impacts to fauna occur:

1. Habitat or hollow-bearing trees have been marked with an 'H' and/or flagged with flagging tape (Photograph 1). If tape or paint has been removed it is to be re-applied. Additionally, if other hollow-bearing trees are identified they are to be marked in the same manner.

Photograph 1 Hollow bearing tree marked for removal

2. Clear the vegetation that is surrounding the hollow bearing or habitat trees first and leave the hollow bearing or habitat trees to stand for one night. Shake or knock the tree to encourage fauna to leave -this should occur the day before clearing. Proceed to the next step
3. Before removing any hollow bearing or habitat trees, the contractor ecologist is complete a visual inspection for signs of animal movement, or nest occupation, in the vegetation that is about to be cleared. Make sure the spotter can locate all the hollows/habitat within the vegetation that is about to be cleared and that the spotter has direct contact with the plant or chainsaw operator via radio and or visual contact. Proceed to the next step
4. Before clearing the vegetation, use an excavator or front-end loader to nudge the trunk of the tree as high as possible a few times. Wait 30 seconds and then repeat the process. If a chainsaw is being used to clear the vegetation or the tree is being removed in stages, then remove the non-hollow bearing branches first. Proceed to the next step
5. Once all the non-hollow bearing branches have been removed, begin removing the hollow bearing branches one by one. The next hollow bearing branch can only be removed once the spotter has checked the previous hollow bearing branch that was removed for fauna. Proceed to the next step
6. Any animals that escape during the clearing process are to be recorded and records maintained in an internal fauna finds register. If any animals are found and won't leave/are

injured during the vegetation clearing process, then the 'Animal Handling Procedure' in Section 7.7 will be used

7. Felled trees are to be rolled so that the number of hollows blocked against the ground is minimised, where possible
8. Felled trees that may hold sheltering fauna are to remain in place at least overnight to allow any remaining fauna to escape. If such a tree is accidentally felled in the wrong direction to which it was planned and subsequently needs to be moved (i.e., blocks a track, road or similar), it can be moved on the day of felling to rectify the issue. In such circumstances, with consideration to safety or accessibility concerns, the tree must only be moved the minimum distance required to rectify the issue
9. All hollow bearing branches/trees, as well as other large woody debris specifically from works within Duck Creek and A'Becketts Creek, that have been cleared will be relocated to another area for habitat enhancement, or to other areas of the creek with respect to clearing undertaken within the creek.

7.4.4.2 Clearing in vicinity of rocky habitat or other features

In addition to hollow bearing trees, other fauna habitat features, such as rocky habitat, have been recorded as being present within the clearing area. The following process will be followed to ensure no impacts to fauna utilising these features occur:

1. Completion of actions recommended from the pre-clearing inspections where practicable, including (but not limited to) actions required to discourage fauna occupation and weed or feral fauna management requirements
2. Consider advice of the contractor ecologists (if available) from pre-clearance surveys for most appropriate and effective method of encouraging fauna to vacate the area prior to clearance date
3. If no active usage is identified, there is no further action required prior to clearing works.
4. Complete a visual inspection of the area immediately prior to any clearing works, including specific habitat to be cleared for fauna species and nests that may have become active since pre-clearing inspections
5. Inspect fauna habitat feature (rocky area, termite mounds, and animal den/burrows) after being partially cleared for remaining or injured fauna
6. Any animals that escape during the clearing process are to be recorded and maintained in an internal fauna finds register. If any animals are found and won't leave/ are injured during the vegetation clearing process, then the 'Animal Handling Procedure' in Section 7.7 will be used
7. Cleared rocks, that were identified as habitat, are to be scattered in an area of retained vegetation for habitat enhancement.

7.4.4.3 Clearing of vegetation within the Modification 5 area (Culturally modified trees)

With the Approval of Modification 5, REMM AH5 was required, and provides a risk-based approach to preventing impacts to potentially unidentified culturally modified trees within the Modification 5 area (PCT 920). REMM AH5 therefore requires the supervision of a suitably qualified Heritage Specialist and Registered Aboriginal Party (RAP's) representative during these clearances.

GLC's Heritage Specialists (Umwelt) and associated RAPs have been present during all Mod 5 clearances to date. Where culturally significant trees in the clearance area are determined to be no longer present by the Heritage Specialists and RAPs, their site presence during these clearings may cease. This may only occur following advice from the Heritage Specialists and RAPs.

7.4.5 Post-clearance Inspection

A Post-Clearance Inspection Checklist (GA-FRM-HSE-152) (refer to Attachment 5) is to be prepared by the Environmental Manager (or delegate) immediately after vegetation clearing works, detailing the type and area of vegetation cleared including, where relevant, confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts. This Checklist would be accompanied by any relevant GIS files.

The following will be carried out after any clearing activities are finished:

- Confirm that all clearing(s) were within vegetation clearing limits
- Check for any impacts on trees that were marked as 'to be retained' due to the clearing works
- Check for any impacts on trees that were identified as habitat trees
- Check that non-habitat trees were removed before habitat trees
- Check for impacts on fauna, nests, fauna features due to the clearing works
- Check whether any animals were shocked, injured, or killed as a result of the clearing works.
- Measure the area cleared, topsoil volumes, and survey the works location
- Ensure that Process: Fauna Management was followed for any faunas impacted by clearing works.

A register will be maintained to record the number, and diameter at breast height of removed mature trees and the canopy cover. This will assist Sydney Metro in determining the number of replacement trees and ensure there is a net increase in the number of trees in accordance with CoA C-B8 and C-B9.

7.4.6 Pruning

The use of heavy machinery will be avoided when clearing activities are adjacent to areas to be retained. Appropriate tools to use for pruning are loppers, chainsaws and vehicle mounted saws. In the first instance, hollow bearing limbs will be retained. If this is not possible, the hollow bearing limbs will be inspected by an ecologist/suitably qualified expert and placed in adjacent undisturbed vegetation to provide fauna habitat (inspection will be undertaken in line with the vegetation clearing procedure, refer to Section 7.4.4).

7.4.7 Removal of Vegetation Outside Approved Clearing Boundaries

If construction activities require the removal of any vegetation that is outside of the approved clearing boundaries within the Project construction sites, the following process will be followed:

1. The person who is conducting the clearing activity will notify the Environment Manager (or delegate) of the location and the need for the vegetation impact via the Pre-Clearance Inspection Checklist process
2. The Environment Manager (or delegate) will assess whether the vegetation is heritage listed, part of an EEC, a habitat tree, nominated for retention or protected under relevant legislation and is legally able to be removed and/or trimmed, in consultation with the Environmental Manager. Alternatives to removing the vegetation will also be investigated at this stage
3. If applicable, a planning approval will then be undertaken depending on the outcome of the assessment in Step 2 above, and then submitted to Sydney Metro for Approval.

4. The Environmental Manager will consult with the relevant stakeholders or authority if the vegetation is suspected to be heritage listed, part of an EEC, a habitat tree, nominated for retention or protected under relevant legislation.

7.4.8 Monitoring the Total Clearing Footprint for the Project

Vegetation clearance will be undertaken in the areas identified within the clearing area in the BDAR prepared for the EIS (Jacobs, 2020),Modification 2 Report (Biosis, 2021) and BDAR prepared for Modification 5 Report (ECC 2023). Table 13 specifies the total amount of clearance that is permitted by the development.

Table 13: Total amount of clearance permitted by the Project

PCT ID	PCT Name	Corresponding TEC	Clearing limit (ha)
849	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Cumberland Plain Woodland in the Sydney Basin Bioregion	0.57
920	Mangrove Forests in estuaries of the Sydney Basin Bioregion and Southeast Corner Bioregion	-	0.55

Prior to any clearing, the Construction Manager and the Environmental Manager or delegate will liaise with each other to identify and display clearance boundaries for the Project construction sites. GLC will utilise a variety of methods to determine the extent of clearing relative to existing vegetation, such as site surveys, mapping and GIS databases.

The cumulative amount of vegetation cleared will be progressively monitored by the Environmental Advisor. Prior to undertaking any clearing, the value to be cleared will be compared to the total approved area to be cleared to ensure that the development does not go past any of the clearing limits specified in Table 13.

7.5 Exclusion Fencing and ‘No-Go Zone’ Procedures

To protect vegetation and fauna habitat that is outside of the approved clearance boundaries for the clearing areas, exclusion fencing and signage will be used to protect all areas containing vegetation and habitat that is not to be cleared which is located within proximity of other works activities associated with this Project.

‘No-go zones’ are any areas of vegetation or fauna habitat, outside the designated clearing boundary as indicated on and . These areas will be communicated to construction site personnel (including equipment operators) through site inductions, toolbox talks and targeted training prior to works taking place in the vicinity.

In total, two ‘no-go zones’ have been delineated, including the need for ‘buffer zone’. The ‘no-go zones’ are located at the following Project construction sites:

- Westmead Metro Station
- Clyde MSF:
    - A buffer zone to mark vegetation removal in riparian zones must be utilised.

Where the ‘no-go zones’ are in immediate proximity to works, they will be marked out by the Environmental Advisor. Typical measures to mark out the development’s footprint will include:

- Use of temporary fencing
- Flag tape, para-webbing, or rope.

In the event access into a ‘no-go zone’ is required, a Permit to Enter ‘No-Go Zone’ (GA-FRM-HSE-151) will be acquired, refer to Attachment 6. This Permit aims to identify and justify the need to enter, the potential impact as a result and the need for additional consultation or approvals required.

Fencing around tree protection zones will be established for all mature trees to be retained.. Tree protection zones will be established in accordance with Australian Standard 4970 – Protection of trees on development sites

Figure 7 No-go zones at Westmead

Figure 8 No-go zones at Clyde MSF

7.6 Microbat Management Procedure

Microbat management is required at Clyde MSF in accordance with Condition D7. This microbat management procedure applies within the microbat sensitivity zones, as shown on .

An ecological survey of the site will be undertaken prior to any vegetation clearing activities and building demolition to identify trees and structures which could act as potential microbat roosting sites within the microbat sensitivity zone. This ecological survey will be undertaken either independently of or during the preclearing survey.

If there is evidence of microbat roosts identified during these surveys the following microbat management procedures will be carried out prior to the removal of that vegetation, or the demolition of those structures:

1. The Environmental Manager will be notified immediately.
2. Targeted surveys for microbats at potential roost sites will be carried out to identify the species present. Targeted surveys would be carried out in accordance with 'Species Credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018) for Southern Myotis as detailed below. If threatened microbat species are recorded, the Environmental Manager is to be notified and is responsible for notify relevant government agencies of the find.

Southern myotis *Myotis macropus*

Site	Potential habitat is <2.5km riparian length.		
Survey method	**Survey period**	**Total effort**	**Min. no. of nights/time searching**
Harp trap or mist net	October–March	16	4
Roost search (buildings, bridges etc)	October–March	1 per structure	30 minutes per feature
Acoustic detection	October–March	16	4

Survey methods: *Harp trap or mist net* placed in areas of potential habitat. For larger water bodies mist nets may be necessary. Traps or nets should be set beside or preferably over pools of water along creeks or rivers, particularly in flat or areas of low relief if present. Traps can be set under bridges or culverts, or overhanging branches. The survey may use only mist nets, or a combination of harp traps and mist nets.

Roost search: Any bridges, tunnels, culverts or other structures identified as potential breeding habitat should be searched for bats or signs of bats (guano etc). A torch should be used and attention paid to inspecting cracks or seams in the roof. A handheld bat detector can alert the searcher to ultrasonic calls. If bats or signs of bats are observed, the bats may need to be captured to identify species and breeding status using traps, nets or other methods.

Potential habitat: The range of PCTs associated with the species (as per the TBDC) within 200 meters of any medium to large permanent creeks, rivers, lakes or other waterways (i.e. with pools/ stretches 3m or wider) (Anderson et al. 2005).

3. Where microbats are recorded, replacement roosting habitat in the form of microbat specific nest boxes must be installed prior to demolition and/or vegetation removal in consultation with the Project Ecologist. Microbat nest boxes will be installed within the Duck Creek 'no-go zone'.
4. Following installation of nest boxes, staged microbat exclusion and relocation from occupied habitat will be carried out. Stage microbat exclusion and relocation will be carried out by a suitably qualified ecologist. Once all microbats have flown or have been removed from the

roost as confirmed by an ecologist, microbat exclusion measures such as timber, expanding foam, or plastic will be used to prevent re-entry. Microbat exclusion and removal must be carried out from May to September inclusive, outside of known breeding timeframes (October to mid-April).

5. Following microbat exclusion, roost sites can be cleared in accordance with the tree felling and fauna habitat removal procedure detailed in Section 7.4.4.

All handling of live microbats would be carried out by a qualified and vaccinated ecologist experienced in handling microbats. The ecologist must hold an Animal Care and Ethics Committee approval, a National Parks and Wildlife Service scientific licence for handling native flora and fauna and be vaccinated against Lyssavirus. Any microbats captured during nocturnal or diurnal inspections would be housed in small cloth bags and either:

- Relocated into bat boxes on the temporary bridge over Duck Creek, or
- Housed in a dark, cool, dry, quiet location for nocturnal release on the evening/night following capture.

The ecologist would determine the most appropriate option, giving consideration to the animal's welfare.

Bags containing microbats would be hung in a cool, dry place off the ground, preferably within a wire box for safety. Microbats housed in this way can be taken off site if required. Microbats of the same species would be housed together with no more than five in any one bag. In the event that other species are captured, large bats (head and body 75-95 mm) would not be grouped with smaller bats (head and body <75 mm) as some larger species predate on smaller species. The ecologist would be responsible for releasing any microbats in the evening at the site.

Housed microbats awaiting nocturnal release or relocation into the bat boxes would be placed in a dry and undisturbed place out of the direct sun. Microbats would be kept in a cool, shaded environment (<25°C) and be assessed for heat stress as required. If temperatures exceed 30°C, a cooler location within a local building would be sought.

Any microbats captured at night would be released that night if still dark or held until they could be placed into the bat boxes on the temporary bridge or held for release the following evening. Bats would not be held for longer than 24 hours.

Any microbats captured will be released in the Fauna Relocation Zone (see Section 7.7.3), immediately north of the confluence with Duck Creek and Duck River.

Figure 6: Microbat sensitivity

7.7 Animal Handing Procedure

7.7.1 General Protocols

The animal handling procedure should be implemented at the following Project construction sites as applicable:

- Westmead Metro Station
- Parramatta Metro Station
- Clyde MSF
- Sydney Olympic Park Metro Station.

Should fauna be observed on the project site during vegetation clearing activities, and there is a risk these activities may harm the animal or pose risk to site personnel, the following steps are to be taken:

- Stop all work in the vicinity of the fauna and immediately notify the Project's Environmental team.
- If the animal is identified as a threatened species, then refer to the 'Unexpected Threatened Species Finds Procedure' in Section 7.8
- If possible, allow fauna to leave the area without intervention
- If fauna cannot or will not leave the area without intervention, the fauna are to be removed by a suitably qualified ecologist, licensed fauna ecologist or wildlife carer with specific animal handling experience using the following methodology:
    - cover larger animals with a towel or blanket and place it in a cardboard box and/or canvas bag
    - place smaller animals in a cotton bag, tied at the top
    - keep the animal in a quiet, cool, ventilated and dark location away from noisy construction activities until it can be relocated
    - frogs will be transported in moistened plastic bags (1 frog/bag) with a small amount of leaf litter. The translocation of frogs shall be in accordance with the Hygiene Protocol for the Control of Disease in Frogs
    - if the animal cannot be handled (i.e., venomous reptiles):
        - exclude all personnel from the vicinity with fencing and/or signage
        - record the exact location of the animal/s and provide to the qualified ecologist or appropriate rescue agency (i.e., WIRES).

7.7.2 Injured Fauna

Should fauna be injured as part of the Project construction works, the follow steps are to be taken:

- Call the appropriate rescue agency immediately and follow any advice provided by the agency
- Once the rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the rescue agency
- In the event the rescue agency and/or local veterinary service cannot be contacted, the injured animal will be delivered to the relevant agency as soon as practicably possible.

The relevant fauna rescue services and local veterinary surgeries contact details are listed in Table 14.

Table 14: Fauna rescue services' contact details

Project Construction Site	Agency/Business	Contact Number
All	Qualified Ecologist / Project Ecologist	+614 9949 9711 or +614 2775 3321
All	WIRES	1300 094 737
Westmead Metro Station	Cottage Animal Hospital	(02) 9890 7220
Parramatta Metro Station	Cottage Animal Hospital	(02) 9890 7220
Clyde MSF	Merrylands Vet	(02) 9682 1547
Sydney Olympic Park Metro Station	Animal Referral Hospital Homebush Veterinary Specialists	(02) 9758 8666

7.7.3 Relocation of Fauna

Relocation of fauna from within the Project construction sites is to be carried out where possible by a qualified ecologist or wildlife rescuer and is to be recorded as part of the pre-clearance reporting obligations. If the animal is not injured or stressed, it may be released nearby in an area that is not to be disturbed by the works and in accordance with the following procedures:

- Site identified as a suitable release point by the qualified ecologist or wildlife rescuer
- Release site is to contain similar habitat (the same vegetation community if possible) and occur as close to the original capture location as possible without placing the animal in danger from the continuing constructing works
- If the species is nocturnal, release is to be carried out at dusk
- Release would generally not be carried out during periods of heavy rainfall
- Hollow-dependent species, particularly those with dependent young, shall be released into a temporary nest box.

Where necessary, fauna should be relocated to the closest ‘fauna relocation zones’ as shown on and .

7.7.4 Fauna Handling Information

It is important to consider the following when handling fauna:

- Some animals require particular handling (e.g., venomous reptiles, raptors) and should only be handled by a qualified ecologist or wildlife carer with relevant skills and experience (e.g., WIRES representative)
- If handling bats, the handler must be vaccinated against the Australian Bat Lyssavirus (ABL – a form of rabies)

Any frog handling will be carried out in accordance with the Hygiene Protocol for the Control of Disease in Frogs (DECC, 2008). This protocol recommends onsite hygiene precautions be carried out to minimise the transfer of disease between and within wild frog populations. Measures recommended include:

- thoroughly cleaning/disinfecting footwear and equipment when moving from one site to another
- where necessary in high-risk areas, spraying/flushing vehicle tyres with a disinfecting solution

- cleaning/disinfecting hands between collecting samples/frogs (preference would be given to using bags, rather than bare hands to handle frogs)
- limiting one frog or tadpole to a bag
- bags should not be reused.

FIGURE 10
Fauna Relocation Zones

Figure 7 Fauna relocation for Westmead

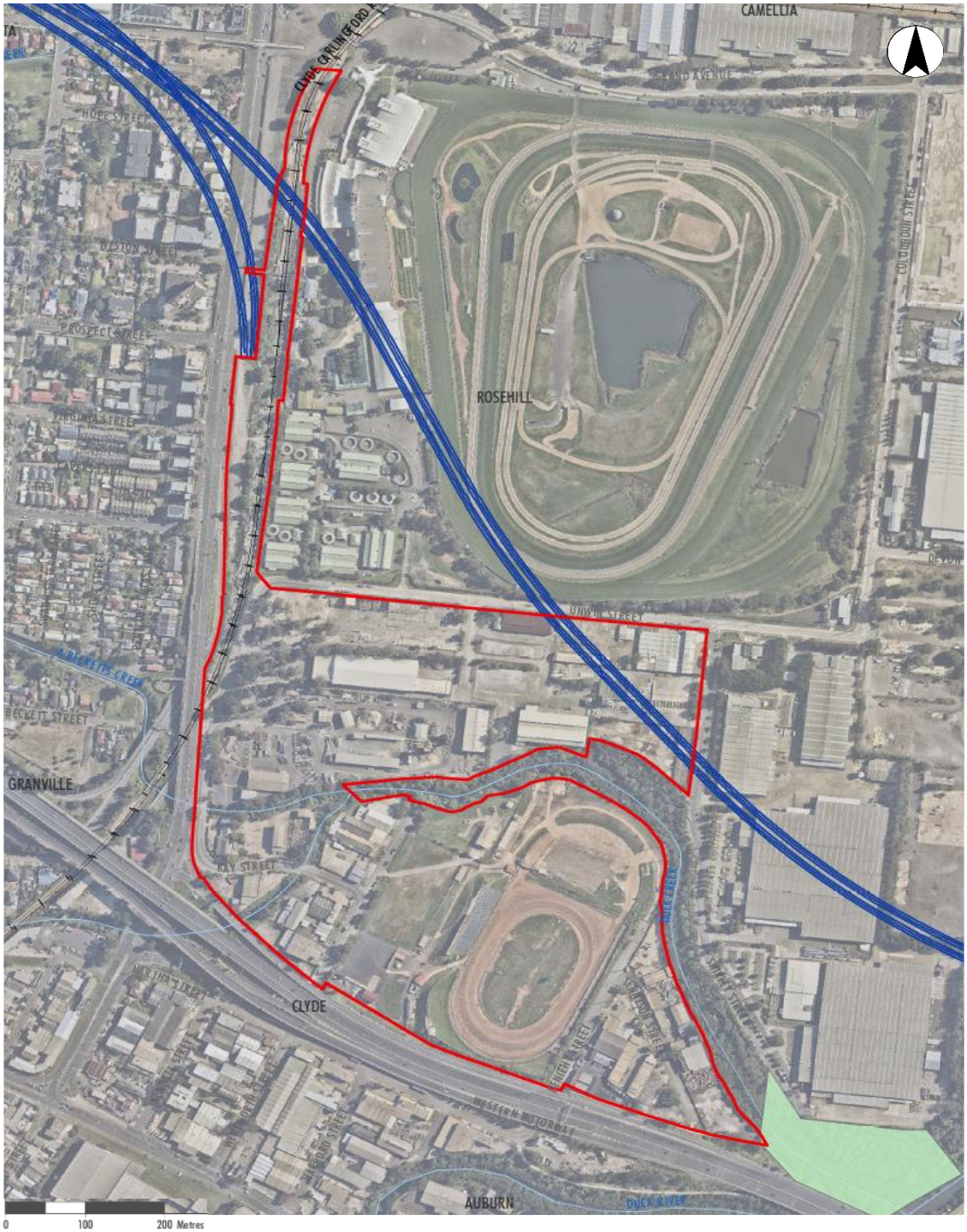


Figure 11 Fauna relocation for Clyde MSF

7.8 Unexpected Threatened Species Finds Procedure

The unexpected threatened species finds procedure should be implemented at the following construction sites as required:

- Westmead Metro Station
- Parramatta Metro Station
- Clyde MSF
- Sydney Olympic Park Metro Station.

During the development's construction, operation and decommissioning phases, the 'Unexpected Threatened Species Finds Procedure' will be implemented whenever a threatened species is unexpectedly found within the Project construction site. Any nests found in habitat features to be removed during construction will be inspected by the contractor ecologist prior to clearing to determine whether fauna are using the nest, and whether relocation of the fauna and the nest to an adjacent area is viable. As a general principle, any native animals found within the Project construction site will be avoided. Fauna will only be handled by a qualified ecologist or wildlife carer with relevant skills and experience (e.g. snake handling), and only when necessary. Should threatened fauna, or suspected threatened fauna, be encountered, the procedure outlined below will be followed. If capture is required, the 'Animal Handling Procedure' in Section 7.7 will be used.

1. If native flora or fauna is found, stop work and determine if it is a threatened species
2. If the native flora or fauna that has been found is a threatened species, or it cannot be identified, notify the Environment Manager who will then notify the Project Ecologist of the found threatened species.
3. The Project Ecologist will assess the occupied habitat within the Project construction site, assess the likely impact, and develop management options
4. If the Project Ecologist identifies that an impact is not likely to occur to the threatened species, then recommence works and maintain regular inspections of the area where the threatened species was found. All personnel are to be notified of the threatened species find via toolbox talks. Proceed to the next step if the ecologist identifies that an impact is likely to occur to the threatened species
5. The Environmental Manager will consult with DPE BCD as appropriate to determine appropriate mitigation measures. Seek and obtain the necessary approvals to recommence works
6. The Environmental Manager will notify the Department of the unexpected threatened species find
7. Recommence works once advice has been sought and implemented and the necessary approvals have been obtained.
8. Updating of ecological monitoring or off-set requirements may be undertaken, if required.

7.9 Weed and Pathogen Control and Management Procedure

Weed and pathogen control and management as detailed within Sections 7.9.1 to 7.9.6 should be implemented at the following construction sites:

- Westmead Metro Station
- Parramatta Metro Station

- Clyde MSF
- Sydney Olympic Park Metro Station.

The extent to which these weed, and pathogen control and management measures are implemented will vary in intensity and extent across the WTP project as the works progress. This is considering that many areas of work will progressively be cleared for construction, introducing greater coverage of hardstand, and eliminating the total amount of weed coverage and or potential habitat for weeds to establish. For example, more than 50% of weed infested vegetation was cleared for the delivery of works at Westmead, Clyde MSF and Clyde Dive, following which construction elements including hardstand and haul routes were installed.

Given the project continues to clear potential and actual weed infested vegetation, detailed GPS and weed mapping are not warranted for the project. Instead, the principles of weed identification, treatment, disposal and monitoring as detailed within Sections 7.9.1 to 7.9.6 will apply.

7.9.1 Vehicle Plant and Equipment Movement Vehicle Hygiene Procedure

Vehicle Plant and Equipment Movement Vehicle hygiene procedures will be implemented for any vehicle that enters the Project construction sites during construction which is likely to contact the natural ground or weeds. The procedures include:

- Inspection upon arrival at site access laydown area
- Removal of dirt and/or plant matter from newly arrived vehicles at a designated washdown area by trained site personnel
- Washing and inspection prior to vehicles being given approval to enter the Project construction site
- Inspection and washing of vehicles after leaving the Project construction site if determined to pose a risk to weed dispersion.

Any water from the washdown area will be managed in accordance with the ESCP.

7.9.2 Weed and Pathogen Inspection

During construction, the Environmental Advisor will complete the following weed and pathogen inspections at the following indicative frequencies:

- Monitor weed presence across the Project construction sites monthly
- Monitor weed species presence in exclusion zones monthly
- Targeted weed inspections prior to clearing and grubbing in the affected area
- Identify Myrtle Rust infection or areas of unexplained dieback in retained vegetation.

Any occurrences of pathogens such as Myrtle Rust and unexplained dieback would be monitored and reported.

7.9.3 Weed Treatment

Targeted weed control measures for any recorded outbreaks of Priority Weeds, WONS, or HTWs will be implemented upon discovery as soon as is practicable. The aims of weed treatment include:

- Apply weed treatments to weed infestation areas
- Weeds would be treated in line with advice from the consulting ecologist. The introduction and spread of weeds via vehicles and plant will be controlled by the Vehicle Hygiene Procedure provided in Section 7.9.1.

7.9.4 Herbicide Application Record

Where herbicide use on the Project is not applied as per the limits in Part 1 (4) of the Pesticides Regulation (2017), a qualified person under the Act will be required. All herbicides used however, must be applied as per the Safety Data Sheet (SDS) for that product. Where Herbicides are being used for commercial, agricultural or occupational purposes, a Herbicide Application Record will be retained. This record must be retained by a Sub-contractor (qualified persons) administering the herbicide and will document details as per Part 4 (36) of the Herbicide Regulation (2017).

Herbicides will not be applied:

- Adjacent to water ways unless approved for this specific use
- When plants are stressed on hot days
- After seed has been set
- Within 24 hrs of rain or when rain is imminent
- During windy conditions when the use of herbicides may affect non-targeted areas.

The Environmental Advisor will conduct follow-up inspections for identified weed infestation sites to ensure treatment was successful.

7.9.5 Weed Disposal

Where Priority Weeds, WONS, and HTWs are disturbed by construction activities, weeds and topsoil that may contain weed propagules will be removed and disposed of appropriately.

Where weeds cannot be effectively destroyed prior to topsoil stripping, weed contaminated topsoil will be isolated and either encapsulated by deep burying, or disposed of at an approved offsite licensed facility as directed by the Site Supervisor.

7.9.6 Ongoing Weed Management and Monitoring

Monitoring of weed infestations will occur as part of the routine environmental inspections throughout construction to determine effectiveness of management controls. The presence of any Priority Weeds, WONS, and HTW species and the necessary management actions will be noted as part of the routine Environmental Inspection Checklist as applicable and removed as soon as practically possible.

7.10 Erosion and Sediment Control

Specific erosion and sediment control measures are detailed within the SWMP. These are to be implemented prior to any vegetation clearing.

8 REHABILITATION AND RE-VEGETATION

8.1 Summary

Table 15 identifies the rehabilitation and revegetation measures to be implemented at each of the Project construction sites. Further detail of each management measure is provided in Section 8.2.1 to Section 8.2.4.

Table 15: Summary of rehabilitation and revegetation measures

Location	Management Type
Sydney Olympic Park Metro Station	NA
Clyde MSF	Weed Management Vegetation Retention Zones
Parramatta Metro Station	N/A
Westmead Metro Station	Weed management Vegetation Retention Zones

8.2 Management of Retained Vegetation

8.2.1 Vegetation Retention Zones

The Westmead Metro Station construction site boundary has been reduced to avoid impact to PCT 849 and mature trees. Additional opportunities for the retention and protection of mature trees would be identified during detailed construction planning, including amendments to Project construction site boundaries and location of construction elements. Canopy trimming would be considered where practicable, prior to any tree removal.

Vegetation retention zones (VRZs) protect remnant native vegetation within and adjacent to Project construction sites. In total, two vegetation retention zones have been delineated as shown in and . The vegetation retention zones are located at the following Project construction sites:

- Westmead Metro Station
- Clyde MSF.

Management actions to be carried out within the vegetation retention zones include:

- Weed management as detailed in Section 8.2.2.
- Revegetation and rehabilitation as detailed in Section 8.2.3.

Existing trees to be retained would be protected prior to the commencement of construction in accordance with Australian Standard AS4970 the Australian Standard for Protection of Trees on Development Sites and Adjoining Properties.

Sydney Metro will provide a net increase in the number of mature trees provided at a ratio of 2:1 within ten years of the date of the Project's MCoA or no later than the commencement of ten-year operation of the Project (whichever is earlier).

Figure 12 Vegetation retention zones at Westmead

Figure 13 Vegetation retention zones at Clyde

8.2.2 Weed Management

Weed and exotics species management zones will be managed for weed and exotic species by a suitably qualified bush regeneration contractor. In total, two weed and exotic management zones have been delineated as shown in and . The weed and exotics management zones are located at the following Project construction sites:

- Westmead Metro Station
- Clyde MSF.

Weed management tasks to be carried out by a bush regeneration contractor are detailed in Table 16.

Table 16: Management actions - weed and exotic species management zones.

Action	Detail
Priority weed control	Weeds that are listed as 'priority weeds' for Greater Sydney must be removed from the site or controlled depending on the category of weed and according to the provisions of the Biosecurity Act. Priority weed control is to be carried out across the weed and exotic species management zones for the duration of the management works recommended in the FFMP. Works will be undertaken according to industry best practices.
Primary weeding	Primary weeding is the first round of weeding activity and involves the removal of most of the weed biomass present (shown in Figure A-1). Primary weeding methods include: • 'cut-and-paint', 'frill and fill', long stem scrape or target spraying of woody weeds • hand-removal and spot spraying of smaller woody, vine and herbaceous weeds • spot-spraying and hand-weeding of annuals (e.g., Blackberry, Fireweed and Bidens pilosa). • primary weeding will occur prior to construction commencing.
Secondary weeding	Secondary weeding will involve the targeted removal of priority weed regrowth and hand removal and spot spraying of exotic grasses, herbaceous weeds and seedlings of woody weeds. Secondary weeding will occur approximately one to three months after the completion of primary weeding, depending on the amount of regrowth of herbaceous annuals (and other weeds that have an abundant seed source present in the soil).
Maintenance weeding	Maintenance weeding will occur after secondary weeding and be ongoing during construction works.
Herbicide application	Herbicide application should follow the procedure detailed in Section 7.9.4 above.

Figure 14 Weed and exotic flora management zones for Westmead

Figure 13 Weed and exotic flora management zones for Clyde MSF

8.2.3 Revegetation and Rehabilitation

A Revegetation Management Plan will be prepared and implemented for the renaturalisation of parts of Duck Creek and A ‘Becketts Creek and rehabilitation of the riparian corridor. In areas that are within the tidal limits of Duck Creek and A ‘Becketts Creek only species that are representative of PCT 920 (Mangrove Forests in estuaries of the Sydney Basin Bioregion and Southeast Corner Bioregion) will be used in the revegetation. Species that are locally endemic, are urban-resilient, and are likely to provide native fauna habitat and foraging value will be preferred. Revegetation and restoration works will also seek to re-use woody material and other habitat elements such as rock piles throughout the delivery of works associated with Duck Creek and A 'Becketts Creek. Elsewhere, revegetation must use species that are representative of the most appropriate plant community type in each location, depending on levels of inundation, salinity levels, and elevation as determined by an ecologist. Note: The most appropriate PCT may include the following: 1234, 1136, 781, 1808, 849, and 1800.

Note - Sydney Metro will be responsible for delivering the Revegetation Management Plan.

Station Contractors will deliver the Landscaping Plans for each Station Precinct.

There will be no impact to bat nest boxes installed within the areas of Duck Creek and A ‘Becketts Creek undergoing rehabilitation works, as they will be installed in mature native trees that will not be cleared. These nest boxes will also be marked with locations communicated to the regeneration sub-contractors.

9 MONITORING ACTIONS

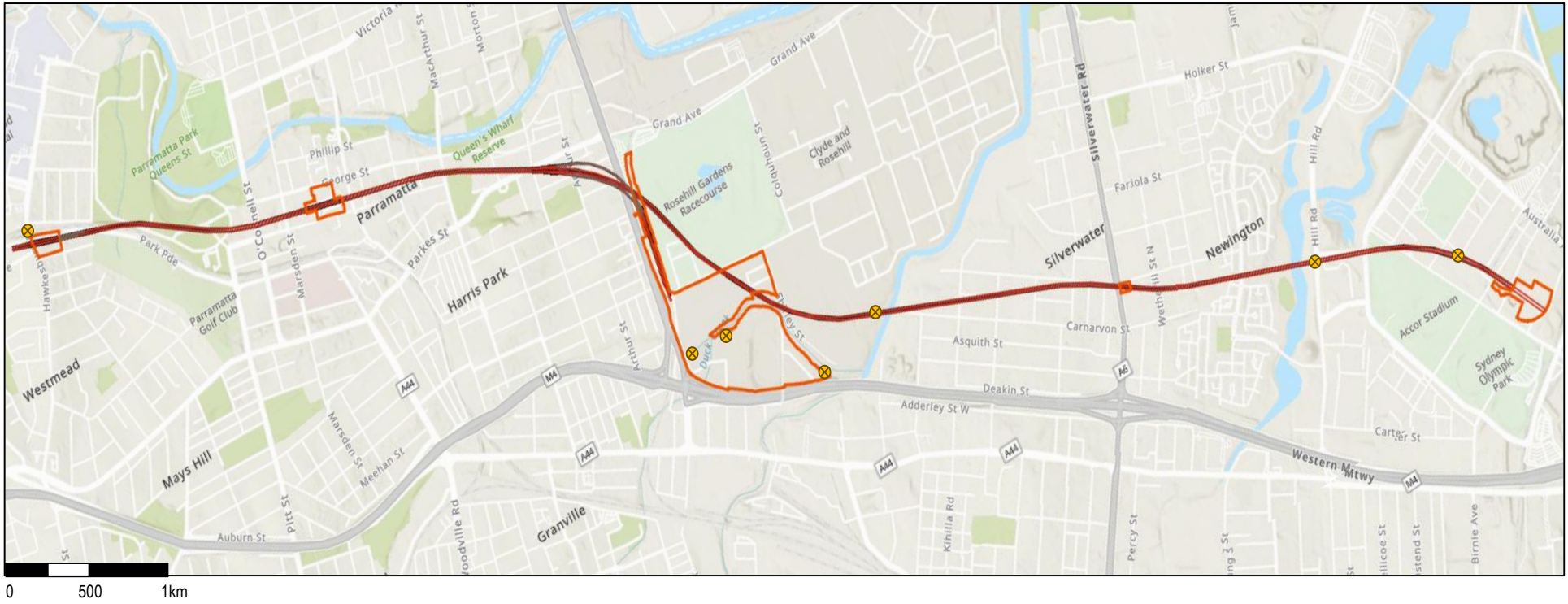
Two monitoring programs will be required to meet the CEMF, the MCoA and the REMMs (Attachment 1). This includes a GDE monitoring program to identify any impacts on groundwater dependent vegetation caused by the excavation and tunnelling works, and a revegetation monitoring program to track the effectiveness of the revegetation works (described in Section 8).

9.1 Groundwater Dependent Ecosystem Monitoring Program

Groundwater Dependent Ecosystems will be monitored using groundwater monitoring wells (GMW's) to infer any potential groundwater drawdown impacts, as well as visual observations and inspections of the health of GDE's over the course of the project works. The frequency of monitoring will occur in accordance with the Groundwater Monitoring Program as well as the Surface Water Quality Monitoring Program. Visual inspections may also form part of GLC's Weekly Inspection Checklist as deemed relevant (based on site and proximity to a GDE).

Since approval of the FFMP by the planning Secretary in April 2022, several nominated GDE inspection points (formerly referred to as BAM vegetation integrity plots for the purpose of capturing representative GDE's) were destroyed with the clearing of GDE's with the progression of works. For example, two of the three visual observation locations nominated within the western most portion of Duck Creek were cleared to deliver the Water Conveyance Structure for WTP within the Clyde construction site. The locations where visual observations of the health of GDE's will therefore be undertaken in various locations where GDE's are present. Where these locations are impacts by project works, alternative locations will be sought, however these would correlate with a known location of a GDE as depicted in Figure 6.

Any persistent changes to groundwater dependent ecosystems (GDE's) will also be determined through the monitoring of groundwater wells nearest to GDE's as part of the Groundwater Monitoring Program (GMP). The location of monitoring wells nearest to the GDE's, and which are being monitored as part of the GMP are depicted in Figure 16 below. The approximate location of these groundwater monitoring locations have been determined based on the occurrence of GDEs relative to tunnelling or excavation works. As is the case for GDE's impacted by project works, where GMW's used for monitoring GDE's are destroyed by project works, alternative locations or new wells may be nominated to monitor impacts to GDE's.



Legend

- Project boundary
- Tunnel alignment
- Indicative Groundwater Monitoring Wells

Figure 16 Indicative groundwater monitor wells to assess impacts to GDE's.

10 COMPLIANCE MANAGEMENT

10.1 Roles and Responsibilities

The GLC Project Team's organisational structure and overall roles and responsibilities are outlined in Section 7 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 17 of this Plan.

Key roles with regards to the management of flora and fauna are identified in Table 17.

Table 17: Roles and responsibilities

Role	Authority and Responsibility
Environmental Manager	• Develop and implement the FFMP • Oversee flora and fauna monitoring in accordance with this sub-plan • Oversee consideration of feasibility of native seed collection, plant propagation program, translocation and vegetation reuse at Clyde MSF • Oversee compliance tracking and reporting • Oversee the keeping of all environmental records • Release Hold Points • Engage suitably qualified consultants to support implementation of this sub-plan • In consultation with the Project Director and Construction Director, oversee the investigation and reporting of environmental incidents arising from flora and fauna impacts • Regularly engage with the key stakeholders and other interface contractors to achieve environmental alignment.
Project Ecologist	• Carry out pre-clearance surveys across the Project construction sites where required • Oversee vegetation clearing and fauna habitat removal as required • Release Hold Points in conjunction with the Environmental Manager as required • Microbat and Threatened species (fauna) management
Project Arborist	• Oversee cutting of roots if required • Ensure Project compliance with 'AS 4970-2009 Protection of trees on development sites'
Senior Environmental Advisor	• Complete inspections and monitoring, particularly of No-Go zones and site clearing limits (refer to Section 7.4.1) • Complete reporting (refer to Section 10.3) • Prepare ECMs to outline the controls in this sub-plan relevant to each work activity, particularly the identification of No-Go Zones and all site clearing limits • Liaise with the ER and / or Sydney Metro regarding site inspections • Respond to environmental incidents and non-conformances
Environmental Advisor	• Delivery of toolbox / prestart presentation (or other specific training) to inform work crews of the controls documented in the ECMs

Role	Authority and Responsibility
	• Perform regular on-site liaison and inspections • Provide environmental advice and assistance to construction personnel • Manage implementation of FFMP • Respond to environmental incidents and non-conformances
Construction Manager	• Ensures compliance with this FFMP, procedures and ECMs • Work collaboratively with environment teams to ensure the mitigation and management measures in this FFMP are integrated into construction works • Ensure that flora and fauna impacts are always considered in forward planning and scheduling
Site Supervisor	• Install and maintain environmental controls in accordance with ESCPs and ECMs, including clear delineation of site boundaries and protection of No-Go Zones • Attend inspections with the Environmental Representative, Sydney Metro / ER, or other stakeholders • Implement corrective actions raised during environmental inspections in agreed timeframes • Notify the Environmental Representative any observed impacts on flora and fauna, including weed and pest infestations, clearing outside boundary limits, fish kills, unauthorised discharges, etc.
All personnel	• Notify Site Supervisor of any observed impacts on flora and fauna, including weed and pest infestations, clearing outside boundary limits, fish kills, unauthorised water discharges, etc.

10.2 Training

The general project induction will include a component on flora and fauna management to ensure that personnel understand the potential impacts from construction and the proposed mitigation measures.

The site induction training will address elements related to flora and fauna management including but not limited to:

- Existence and requirements of this FFMP
- Clearing limits
- No-gone zones
- Relevant legislation
- Roles and responsibilities for flora and fauna management.

Targeted training in the form of toolbox talks or tailored training sessions will also be provided to personnel with a key role in flora and fauna management. Specific training may include:

- Obligations and specific responsibilities under the Project MCoA including vegetation clearing practices to minimise impacts on species, including threatened species or endangered ecological communities identified as likely to occur on site
- Responsibilities pertaining to the protection of flora and fauna under the BC Act, the EPBC Act and other relevant legislation outlined in Section 4.1 of the FFMP

- Identification and recognition of No-go Zones and measures to avoid impact outside of authorised areas
- Recognition of specific species, such as the Green and Golden Bell Frog and Southern Myotis, which may be affected by the construction works
- Response procedures in the event of an unexpected threatened species find, fauna rescue and handling of fauna and location of nest boxes
- Response procedures for avoidance of weed and pathogen control, particularly the amphibian chytrid fungus affecting the Green and Golden Bell Frog.

Specific training will be provided to personnel likely to work within or in proximity (<50 m) to flora and fauna areas. Where required, toolbox /pre-start talks will also include limits of clearing, clearing procedures, weed identification and control measures and fauna handling protocols.

Further details regarding inductions and training are outlined in Section 9 of the CEMP.

10.3 Monitoring, Inspections and Reporting

Monitoring, inspection, and reporting requirements are outlined in Table 18, including their indicative frequencies.

Additional requirements and responsibilities in relation to monitoring and inspections are documented in the CEMP.

Table 18: Inspection, monitoring and reporting requirements

Item	Frequency	Standards	Reporting	Responsibility
Inspection				
Pre-clearance survey	Prior to any clearance of an identified habitat area	Pre-clearing Survey Procedure – demarcating the extent of disturbance.	Pre-clearing survey report	Project Ecologist Senior Environmental Advisor or delegate
Pre-clearance inspection *CEMF 10.2B(i) only requires an ecologist where native vegetation is being removed.	Between 24 and 48 hours prior to vegetation clearance	Pre-clearing Survey Procedure No-go zones in place Erosion and sediment controls in place	Pre-clearance Inspection Checklist	Project Ecologist* Senior Environmental Advisor
Post-clearance inspection	Post vegetation clearance immediately after vegetation clearance	Post-clearing Survey Procedure	Post-clearance Inspection Checklist Tree Register	Senior Environmental Advisor
Site inspections	Weekly inspections	All flora and fauna management measures in place, maintained and effective, including: Erosion and sediment controls Clearing limits – Including disturbance limits within the Creeks where works are required. Protection of no-go zones Construction water discharge practices Chemical and fuel storage and spill response readiness	Environment Inspection Checklist	Site Supervisor and Environmental Advisor

Item	Frequency	Standards	Reporting	Responsibility
		Concrete disposal and washout facilities. Monitor health of retained vegetation Revegetation/rehabilitation areas will be monitored during construction for performance and weed invasion during weekly site inspections, and any other inspections or audits undertaken as part of CEMP requirements. The performance of revegetation and presence of weed infestations would be reported as part of the inspection process and include actions to be undertaken to manage performance.		
Independent site inspections	As required	Compliance with the requirements of this Plan and existing Approvals.	ER Environmental Inspection Report	Environmental Representative / Sydney Metro
Visual surveillance	Daily	No-go zone fencing and signage in place and undamaged Storage and stockpile areas maintained and being used appropriately Weed and pathogen hygiene controls in place Site speed limits obeyed at all times Any threats to animals or unexpected finds of flora and fauna	Site Supervisor's diary	Site Supervisor
Observations by Management	Monthly	Compliance with the requirements of this Plan	Management Inspection Checklist	Senior Environmental Advisor
Flora and fauna control measures	At least weekly Immediately before site closure greater than 48 hours	Ensure that all flora and fauna control measures, including ERSED and boundary fencing, are installed on the premises are inspected and works undertaken to repair and/or maintain these controls if practicable and safe to do so.	Environmental Inspection Checklist	Site Supervisor and Environmental Advisor

Item	Frequency	Standards	Reporting	Responsibility
	Within 24 hours of the cessation of a rainfall event causing: runoff to occur on or from the premises prior to any major rainfall event forecasted.			
Monitoring				
Microbat monitoring	If required as a result of pre-clearing inspections, as per the Microbat Management Procedures		Site Supervisor and Project Ecologist	
Groundwater Dependent Ecosystems (GDE) monitoring	As per the GMP		Senior Environmental Advisor	
Weed and pathogen monitoring	As per the Weed and Pathogen control and management procedure		Site Supervisor and Environmental Advisor	
Attendance of ecologist or fauna spotter/catcher during habitat clearance	As required by Vegetation Disturbance Permit	Pre-clearance survey procedure Records of fauna capture and release	Vegetation/ habitat clearance records Fauna records	Project Ecologist and Senior Environmental Advisor
Attendance of EA or arborist during excavations in tree protection zone	During excavation near TPZ	Pre-clearance survey procedure	Vegetation/ habitat clearance records	Senior Environmental Advisor and Environmental Advisor
Rehabilitation monitoring	Weekly after rehabilitation works commence	Until area is stabilised	Environmental Inspection Checklist	Site Supervisor and Environmental Advisor

Item	Frequency	Standards	Reporting	Responsibility
Reporting				
DPE Compliance Reporting	Continuous	Compliance tracking against the MCoA's applicable to flora and fauna aspects	Submission to DPE	Senior Environmental Advisor

10.4 Auditing

Audits (both internal and independent) will be undertaken to assess the effectiveness of environmental controls, compliance with this sub-plan, MCoA and other relevant approvals, licenses, and guidelines. These audits will be undertaken at planned intervals to provide information on whether the Project:

- Is meeting its compliance obligations
- Conforms to this sub-plan
- Determines if this sub-plan is effectively implemented and maintained.

GLC will undertake an internal audit within the first three months from commencement of construction and then annually for the FFMP.

The approach to internal and independent audits, including auditing schedule, is outlined further in Section 11.3 of the CEMP.

10.5 Environmental Incidents

Management of environmental incidents is detailed in Section 12.2 of the CEMP.

Examples of incidents as they relate to flora and fauna may include:

- Unapproved vegetation clearing
- Damage to threatened fauna habitat
- Spread of weeds and pathogens
- Contamination of waterways
- Unexpected threatened species finds.

10.6 Complaints Register

All complaints made by the community and stakeholders will be managed in accordance with the Sydney Metro's requirements, the Overarching Community Communication Strategy, including the Sydney Metro Construction Complaints Management System (CCMS) (2021), as well as relevant MCoAs (B1 – B6). Further details on the complaints register can be found in the Project CEMP (SMWSTWTP-GLO-1NL-EV-PLN-000001), Section 10.

11 REVIEW AND IMPROVEMENT

11.1 Continuous Improvement

The Project Management Team will review the status and adequacy of the EMS including the CEMP and Sub-plans. The objective of the review will be to ensure that it meets current Sydney Metro and GLC requirements as well as relevant environmental standards.

Continuous improvement of this FFMP will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives, and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any nonconformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

In order to ensure continual improvement and prevent recurring issues, this sub-plan will be reviewed in response to:

- Corrective actions arising from non-conformance, incidents, or audits
- Opportunity for improvement in environmental management performance which may be identified by the project team, ER or Sydney Metro
- Changes to the Gamuda Engineering (Australia) EMS.

Review of this sub-plan will occur annually as a minimum, or as needed in consultation with Sydney Metro and the ER. A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure as outlined in the CEMP.

11.2 Document Updates

The processes described above may result in the need to update or revise this sub-plan. This will occur annually as a minimum, or as needed, and may only be approved by the Environmental Manager, or delegate.

Where minor amendments are required to this FFMP, the revised FFMP will be issued to the ER for review and endorsement in accordance with MCoA A30(j).

11.3 Distribution

All GLC personnel and contractors will have access to this FFMP via the project document control management system.

The approved FFMP will be published on the GLC website in accordance with MCoA B11, before the commencement of works to which an update relates and be available for a minimum of 24 months following the completion of all phases of Construction of Stage 1 of the CSSI.

The document is uncontrolled when printed.

REFERENCES

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Standards Australia Limited (2009) Australian Standard AS4970 Protection of Trees, Standards Australia Limited, Sydney.

ATTACHMENTS

Attachment 1 – Compliance Matrix

The MCoA, REMMs, CEMF requirements and EPL requirements that relate to this FFMP are detailed in the following tables.

MCoAs

ID	Conditions of Approval	Document Reference
A2	Stage 1 of the CSSI must only be carried out in accordance with all procedures, commitments, preventative actions, performance criteria and mitigation measures set out in the documents listed in Condition A1 of this schedule unless otherwise specified in, or required under, this approval.	CEMP
A6	Where the conditions of this approval require a document or monitoring program to be prepared, or a review to be undertaken, in consultation with identified parties, evidence of the consultation undertaken must be submitted to the Planning Secretary with the document. The evidence must include:	
	(a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval;	Section 1.4, Attachment 2 and Section 10.2 of the CEMP
	(b) a log of the dates of engagement or attempted engagement with the identified party and a summary of the issues raised by them;	Section 1.4, Attachment 2 and Section 10.2 of the CEMP
	c) documentation of the follow-up with the identified party(s) where feedback has not been provided to confirm that the party(s) has none or has failed to provide feedback after repeated requests;	Section 1.4, Attachment 2 and Section 10.2 of the CEMP
	(d) outline of the issues raised by the identified party(s) and how they have been addressed; and	Section 1.4, Attachment 2 and Section 10.2 of the CEMP

ID	Conditions of Approval	Document Reference
	(e) a description of the outstanding issues raised by the identified party(s) and the reasons why they have not been addressed.	Section 1.4, Attachment 2 and Section 10.2 of the CEMP
C-B2	(c) renaturalisation of parts of Duck Creek and A'Becketts Creek and rehabilitation of the riparian corridor	Section 8.2.3
C-B8	As many mature trees as practicable must be retained. In addition, within ten (10) years of the date of this approval or no later than the commencement of ten year operation of the CSSI (whichever is earlier) there must be a net increase in the number of mature trees provided at a ratio of 2:1.	Section 8.2
C-B10	Parts of Duck Creek and A'Becketts Creek that remain open channels at the Clyde Stabling and Maintenance Facility site must be rehabilitated and / or renaturalised before operation of the CSSI commences. In areas that are within the tidal limits of Duck Creek and A'Becketts Creek, only species that are representative of PCT 920 are to be used in the revegetation. Elsewhere, revegetation must use species that are representative of the most appropriate plant community type in each location, depending on levels of inundation, salinity levels, and elevation as determined by an ecologist. Note: The most appropriate PCT may include the following: 1234, 1136, 781, 1808, 849, and 1800.	Section 8.2.3
C1	Construction Environmental Management Plans (CEMPs) and CEMP Sub-plans must be prepared in accordance with the Construction Environmental Management Framework (CEMF) included in the documents listed in Condition A1 of this schedule to detail how the performance outcomes, commitments and mitigation measures specified in the documents listed in Condition A1 of this schedule will be implemented and achieved during construction.	CEMP and this document
C5	Of the CEMP Sub-plans required under Condition C1 of this schedule, the following CEMP sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of issues raised by a government agency during consultation must be included in the relevant CEMP Sub-plan, including copies of all correspondence from those government agencies as required by Condition A6 of this schedule. Where a government agency (ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why:	Attachment 2
C6	The CEMP sub-plans must state how: a) the environmental performance outcomes identified in the documents listed in Condition A1 of this schedule will be achieved;	This document

ID	Conditions of Approval	Document Reference
	b) the mitigation measures identified in the documents listed in Condition A1 of this schedule will be implemented;	This document
	c) the relevant conditions of this approval will be compiled with; and	This document
	d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.	Section 6, Section 7 and Section 8, the CEMP
C7	With the exception of any CEMP Sub-plans expressly nominated by the Planning Secretary to be endorsed by the ER, all CEMP Sub-plans must be submitted to the Planning Secretary for approval.	Section 1.5
C8	The CEMP Sub-plans not requiring the Planning Secretary's approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all relevant undertakings made in the documents listed in Condition A1 of this schedule. Any of these CEMP Sub-plans must be submitted to the ER with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is phased no later than one (1) month before the commencement of that phase.	Section 1.5
C9	Any of the CEMP Sub-plans to be approved by the Planning Secretary must be submitted to the Planning Secretary with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is phased no later than one (1) month before the commencement of that phase.	Section 1.5
C10	Construction must not commence until the CEMP and all CEMP Sub-plans have been approved by the Planning Secretary or endorsed by the ER (whichever is applicable), unless otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans, as approved by the Planning Secretary or endorsed by the ER (whichever is applicable), including any minor amendments approved by the ER, must be implemented for the duration of construction. Where construction of Stage 1 of the CSSI is phased, construction of a phase must not commence until the CEMP and CEMP Sub-plans for that phase have been approved by the Planning Secretary or certified by the ER upon nomination by the Planning Secretary (whichever is applicable).	Section 1.5
C11	In addition to the relevant requirements of the CEMF, the Flora and Fauna CEMP Sub-plan must include, but not be limited to: a) site specific mitigation measures to manage impacts (including proposed techniques, timing, frequency and responsibility of implementing);	Section 7, Section 8 and Section 9

ID	Conditions of Approval	Document Reference
	b) measures to minimise disturbance to habitat associated with Myotis Macropus / Southern Myotis, including demolition inspections by a suitably qualified ecologist of any vegetation to be cleared and any buildings or structures identified as potential roosting habitat for microbats that are to be demolished or refurbished;	Section 7.6
	c) measures to minimise and mitigate disturbance to mangrove forests at the Clyde Maintenance and Stabling construction site to the extent necessary; and	Section 7.5 and Section 8.2.3
	d) details for undertaking and mitigating vegetation clearance through improved environmental outcomes.	Section 7.4 and Section 8.2
D2	The clearing of native vegetation must be minimised to the greatest extent practicable with the objective of reducing impacts to threatened ecological communities and threatened species habitat.	Table 11 and Section 8.2
D3	Impacts to plant community types must not exceed those identified in the documents listed in Condition A1 of this schedule, unless otherwise approved by the Planning Secretary. In requesting the Planning Secretary's approval, an assessment of the additional impacts(s) to plant community types and an updated ecosystem and / or species credit requirement under Condition D4 below, if required, must be provided.	Section 7.4
D4	Before any vegetation clearing or tree removal that must be offset, the relevant credits specified in the table below, must be purchased and retired. The retirement of credits must be carried out in accordance with the offset rules of the BC Act. Note: Credits have been calculated using the Biodiversity Assessment Method.	Section 4.2.1
D5	The requirement to retire credits in Condition D4 may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the class and number of species credits, as calculated by the Biodiversity Offsets Payment Calculator.	Section 4.2.1
D6	The Proponent must submit evidence of the retirement of credits required by Condition D4 to the Planning Secretary for information within one (1) month of receiving evidence of the retirement of credits and / or a certificate confirming payment under Condition D5 before any vegetation clearing or tree removal that must be offset under the BC Act.	Section 4.2.1 and Section 4.2.1.1 and 4.2.1.2
D6A	Impact to Key Fish Habitat (KFH) as defined in Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013 update) must be avoided where possible. KFH must be offset at a ratio of 2:1 in accordance with the documents listed in Condition A1.	Section 4.2.1 and Section 4.2.1.1 and 4.2.1.2

ID	Conditions of Approval	Document Reference
	On-ground offsetting within Duck or A'Becketts Creek catchments must be prioritised. Where there are insufficient on-ground offset opportunities within the Parramatta River catchment, a compensatory payment for the residual offset, at the rate outlined in the documents listed in Condition A1 of this schedule, must be made to the DPI Fish Conservation Trust Fund by the time specified in the Key Fish Habitat Offset Strategy required in Condition D6B. A receipt confirming payment to the DPI Fish Conservation Trust Fund must be submitted to the Planning Secretary within one (1) month of making the payment.	
D6B	A Key Fish Habitat Offset Strategy (the strategy) must be prepared in consultation with DPI Fisheries and published in accordance with Condition B11 before the commencement of operation of the Concept of the CSSI. The strategy must: (a) consider relevant policies and guidelines, including but not limited to, the NSW Biodiversity Offsets Policy for Major Projects and Policy and guidelines for fish habitat conservation and management. Update 2013 (DPI, 2013); (b) preference on-ground offsetting within Duck or A'Becketts creek catchments where practicable. Where sufficient offsets cannot be provided in those locations, alternative locations within the Parramatta River catchment may be considered; (c) consider, in order of priority: i) expanding existing mangrove or saltmarsh patches, and ii) improving condition of existing mangrove or saltmarsh patches by removing exotic or non-endemic species to allow for natural regeneration of mangrove and saltmarsh species and / or replacing these with mangrove or saltmarsh species; (d) identify outcomes to be achieved, including the form and timing for them to be achieved and the likely split between on-ground and other offsets; (e) include a program for completion of rehabilitation work identified; and (f) include a maintenance and monitoring program which establishes clear actions, timing, success targets and actions to be undertaken when success is not achieved. Note: When considering c)(i), the Proponent should investigate opportunities for reducing the gradient of steep banks that currently do not support marine vegetation and creating new levels that would be appropriate for mangrove or saltmarsh habitat.	Key Fish Habitat Offset Strategy (To be developed by Sydney Metro)
D7	Before the removal or clearing of any vegetation, or the demolition of structures identified as potential roosting sites for microbats at the Clyde Stabling and Maintenance Facility site commences, pre-clearing / demolition	Section 7.6 and Section 7.4

ID	Conditions of Approval	Document Reference
	inspections for the threatened species must be undertaken. The inspections, and any subsequent relocation of fauna and associated management / offset measures, must be undertaken under the guidance of a suitably qualified and experienced ecologist. Survey and relocation methodologies and management / offset measures must be included in the Flora and Fauna CEMP Sub-plan required under Condition C5 (refer to Conditions of Approval) or the relevant Site Establishment Management Plan required by Condition A17 (refer to Conditions of Approval).	
D8	In the event roosting sites have been identified under Condition D7, bat boxes must be provided, or suitable habitat built within the Clyde Stabling and Maintenance Facility site.	Section 7.6
D9	As many mature trees and as much urban canopy as practicable must be retained during construction. Canopy trimming should be considered where practicable prior to any mature tree removal.	Section 7.1 and Section 8.2
D120	Drainage feature crossings (permanent and temporary watercourse crossings and stream diversions) and drainage swales and depressions must be carried out in accordance with relevant guidelines and designed by a suitably qualified and experienced person.	The SWMP

REMMs

ID	Revised Environmental Mitigation Measure	Document Reference
AH5	Vegetation clearance activities within the Modification area must be supervised by a suitably qualified heritage consultant and Registered Aboriginal Party representative, to ensure that there are no impacts to potentially unidentified culturally modified trees.	Section 7.4.4.3 HMP
B1	During construction, sufficient flow and fish passage would be maintained similar to current conditions during in-stream works where feasible and reasonable	Section 7.1
B2	The A'Becketts Creek and Duck Creek crossings would be designed to: a) Provide sufficient fish passage in accordance with Policy and guidelines for fish habitat conservation and management Update 2013 (DPI Fisheries NSW, 2013)	Section 7.1
	b) Incorporate suitable scour protection	Section 7.1
	c) Avoid worsening existing flow velocities downstream from the crossing locations	Section 7.1

ID	Revised Environmental Mitigation Measure	Document Reference
	d) Incorporate a vegetated riparian zone within the realigned open channel sections where feasible and reasonable.	Section 7.1
B3	Additional investigations and assessment would be completed to confirm the potential for impacts to groundwater dependent ecosystems due to groundwater drawdown, and to identify any required mitigation through design.	Section 7.1
B4	Consider the feasibility of native seed collection, plant propagation program, translocation of juvenile and mature native plants and the reuse of vegetation proposed to be removed at Clyde stabling and maintenance facility within the Flora and Fauna Management Plan.	Section 7.4
B5	During the construction works within Duck Creek and A'Becketts Creek, the following would be considered: • platforms/temporary wharfs would be used in preference to weirs for instream construction works. • floating booms and silt curtains would be implemented around work zones. • remediation and revegetation of disturbed banks and mangrove vegetation would occur as soon as possible following disturbance.	Section 7.1 and 7.3
B6	Impacts to mangroves, coastal wetlands and other key fish habitat are to be offset in accordance with Policy and guidelines for fish habitat conservation and management (DPI, 2013) in consultation with DPI Fisheries.	Section 4.2.1
B7	Large woody debris (i.e., dead logs and trees) identified during work within Duck Creek and A'Becketts Creek would be relocated to nearby, unaffected areas of the creeks.	Section 7.4.1
B8	The proposed Bailey Bridge at the Clyde stabling and maintenance facility construction site would be designed to: • establish mangrove vegetation and placing habitat elements such as rock piles and large woody debris under the bridge and along riverbanks to provide cover for fauna. • provide landscaping in the vicinity of the works to funnel some surface water flow under the bridge, thereby allowing water to absorb into the soil and encourage plant growth. • consider deposit of fine-grained sediments under the bridge to allow mangrove roots to spread and respire effectively.	Section 7.1 and 8.2.3
B9	To avoid the spread of weeds, pests and pathogens during construction works within Duck Creek and A'Becketts Creek: • machinery, silt curtains and other plant and equipment that may facilitate the spread of Caulerpa or other pests would be washed down with fresh water and inspected for fragments before entering site.	7.9.3

ID	Revised Environmental Mitigation Measure	Document Reference
	• occurrence of any pests must be reported to NSW DPI Fisheries.	
B10	Establish and mark vegetation buffer zones in areas of vegetation removal in riparian zones.	Section 7.4 and 7.5
LV11	Opportunities for the retention and protection of existing street trees and trees within the site would be identified during detailed construction planning.	Section 8.2.1
LV12	Existing trees to be retained would be protected prior to the commencement of construction in accordance with Australian Standard AS4970 the Australian Standard for Protection of Trees on Development Sites and Adjoining Properties.	Section 8.2.1
LV13	Trees removed by Stage 1 would be replaced to achieve no net loss to tree numbers and/or canopy in proximity to the site as a minimum in the long term (and part of future stages of Metro West).	Section 8.2.1
LV14	Opportunities would be investigated with the relevant local council to provide plantings in proximity to the impacted areas prior to construction commencing where feasible and reasonable	Section 8.2.3
LV15	Investigate the opportunity for early installation of screening vegetation along the eastern boundary of the former rail corridor alongside the Rosehill Gardens Racecourse and west of the Kay Street and Unwin Street Road bridge where feasible.	Refer to Visual Amenity Management Plan
LV16	Provide vegetation that assists in the screening and visual softening of the road, bridge and other permanent engineered structures where feasible.	Refer to Visual Amenity Management Plan
NAH12	Opportunities to reduce impacts to the 'Wetlands' heritage item, particularly during vegetation removal, would be explored where possible including: • utilising the smallest possible machinery to minimise potential impacts to vegetation during construction activities. • investigate opportunities to safely tie back branches within the works areas, as opposed to cutting or removal of limbs or trees in their entirety.	Section 7.4 See CHMP

ID	Revised Environmental Mitigation Measure	Document Reference
	• the selection of the Bailey Bridge location would include consideration of any potential areas of reduced vegetation clearing	

CEMF Requirements

Clause	Requirement	Document Reference
3.4(d)	(iii) For each plan under the CEMP include a matrix of the relevant Conditions of Approval or Consent referencing where each requirement is addressed;	Attachment 1
	(iv) For each plan under the CEMP, set objectives and targets, and identify measurable key performance indicators in relation to these;	Section 3
10.1a	The following flora and fauna management objectives will apply to construction:	
	(i) Minimise impacts on flora and fauna;	This FFMP
	(ii) Design waterway modifications and crossings to incorporate best practice principles;	Table 11, the SWMP
	(iii) Retain and enhance existing flora and fauna habitat wherever possible; and	Section 8.2.1
	(iv) Appropriately manage the spread of weeds and plant pathogens.	Section 8.2
10.2a	Principal Contractors will develop and implement a Flora and Fauna Management Plan which will include as a minimum:	
	(i) The ecological mitigation measures as detailed in the environmental approval documentation	Section 7, Section 8, Attachment 1
	(ii) The responsibilities of key project personnel with respect to the implementation of the plan	Section 10.1
	(iii) Procedures for the clearing of vegetation and the relocation of flora and fauna	Section 7.4
	(iv) Details on the locations, monitoring program and use of nest boxes by fauna	Section 7.6 and 10.3
	(v) Procedures for the demarcation and protection of retained vegetation, including all vegetation outside and adjacent to the construction sites	Section 8.2

Clause	Requirement	Document Reference
	(vi) Plans for impacted and adjoining areas showing vegetation communities; important flora and fauna habitat areas; locations where threatened species, populations or ecological communities have been recorded	Sections 5.2, 5.3 and 5.4.
	(vii) Vegetation management plan(s) for sites where native vegetation is proposed to be retained	Section 8.2.1
	(viii) Identification of measures to reduce disturbance to sensitive fauna	Sections 7.6, 7.7 and 7.8
	(ix) Rehabilitation details, including identification of flora species and sources, and measures for the management and maintenance of rehabilitated areas (including duration of the implementation of such measures)	Section 8.2.3
	(x) Weed management measures focusing on early identification of invasive weeds and effective management controls	Section 7.9
	(xi) A procedure for dealing with unexpected Endangered Ecological Community (EEC) threatened species identified during construction, including cessation of work and notification of the Department, determination of appropriate mitigation measures in consultation with the DPIE EES (including relevant relocation measures) and updating of ecological monitoring or off-set requirements	Section 7.8
	(xii) Details on the methodology for vegetation mapping and survey	Section 7.4.1
	(xiii) Ecological monitoring requirements	Sections 7.4.8, Section 9 and 10.3
	(xiv) Compliance record generation and management	Section 10
10.2b	Principal Contractors would undertake the following ecological monitoring as a minimum:	
	(i) A pre-clearing inspection will be undertaken prior to any native vegetation clearing by a suitable qualified ecologist and the Contractor's Environmental Manager (or delegate). The pre-clearing inspection will include, as a minimum: • Identification of hollow bearing trees or other habitat features • Identification of any threatened flora and fauna • A check on the physical demarcation of the limit of clearing • An approved erosion and sediment control plan for the worksite • The completion of any other pre-clearing requirements required by any project approvals, permits or licences.	Section 7.4.1

Clause	Requirement	Document Reference
	(ii) The completion of the pre-clearing inspection will form a HOLD POINT requiring sign-off from the Contractor's Environmental Manager (or delegate) and a qualified ecologist;	Section 7.4.1
	(iii) A post clearance report, including any relevant Geographical Information System (GIS) files, will be produced that validates the type and area of vegetation cleared including confirmation of the number of hollows impacted and the corresponding nest box requirements to offset these impacts.	Section 7.4.5
10.2c	The Principal Contractor's regular inspections will include a check on the ecological mitigation measures and project boundary fencing.	Section 10.3
10.2d	The following compliance records would be kept by the Principal Contractor:	
	(i) Records of pre-clearing inspections undertaken;	Section 10.3
	(ii) Records of the release of the pre-clearing hold point;	Section 10.3
	(iii) Records of ecological inspections undertaken.	Section 10.3

Environment Protection Licence

The Project construction activities are designated as 'Railway activities—railway infrastructure construction' under Schedule 1 of the POEO Act. Scheduled activities under clause 48 of the POEO Act, require an Environmental Protection Licence (EPL) for the premise at which a scheduled activity is carried on. The EPL typically regulates the emissions of potentially offensive odours and dust.

No conditions from the EPL (No. 21676) have been allocated to this FFMP

Attachment 2 – Stakeholder Consultation

Engagement Log

Stakeholder	Date of Engagement/ Attempted Engagement
DPI Fisheries	• Sydney Metro sent DPI Fisheries an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document • DPI Fisheries provided comments on 13/04/2022
DPE EES	• Sydney Metro sent DPE EES an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document • DPE EES contacted Sydney Metro on 05/05/2022 stating that they could not provide comments on the FFMP within the 21-day consultation period
SOPA	• Sydney Metro sent SOPA an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document • SOPA provided comments on 27/04/2022
City of Parramatta Council	• Sydney Metro sent the City of Parramatta an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document • The City of Parramatta Council provided comments on 09/05/2022
Cumberland City Council	• Sydney Metro sent the Cumberland City Council an invitation to review and comment on the FFMP on 12/04/2022, which included a cover letter and the FFMP as a PDF document • The Cumberland City Council provided comments on the 11/05/2022 outside the 21 day consultation period. Comments have been included in Rev E of this FFMP

Comments Register

Stakeholder	Comment Raised	GLC Response	Where Addressed
DPI Fisheries	Section 4.1 lists the appropriate guidelines and specifications to support DPI Fisheries best	Noted.	Section 4.1

Stakeholder	Comment Raised	GLC Response	Where Addressed
	practise requirements and these have been carried into adequate mitigation and management measures.		
	Section 5.1.7 notes that additional areas of native vegetation are to be impacted and will be subject of SSI-10038-Mod-2. DPI requests to be notified if PCT920 (Mangroves) are to be additionally impacted. PCT920 was incorrectly offset under the Biodiversity Conservation Act (2016) and any additional impacts need to be offset under the Fisheries Management Act (1994).	Noted. SSI-10038-Mod-2 will not be impacting on additional areas of PCT 920 (Biosis 2021) therefore notification is not required.	N/A
City of Parramatta Council	Section 5.1.7 mentions that "the Modification 2 report for the Clyde MSF (SSI-10038-Mod-2) has identified additional areas of native vegetation to be impacted by Project works. This will be included in this sub-plan once approved." Will this additional native vegetation loss trigger the requirement to retire additional Biodiversity Offset Credits under the Biodiversity Conservation Act 2016?	The Biodiversity Development Assessment Report prepared for Modification 2 states that there are no additional offsetting requirements based on the impacts to Plant Community Types. There are however, additional offsetting requirements based on the impacts of up to 27 individuals and 0.14 hectares of Downy Wattle habitat equating to 1 credit (Biosis 2021)	N/A
	Section 7.4.5 states: "If this is not possible the hollow bearing limbs will be inspected by an ecologist/suitably qualified expert and placed in adjacent undisturbed vegetation to provide fauna habitat.". Does this imply that the ecologist is expected to access the tree/hollow-bearing branch? If so, a qualified arborist (having relevant climbing experience) would be more suitable to undertake this work where the hollow-bearing branch cannot be inspected from the ground.	Removal of hollow-bearing limbs will be undertaken in line with the vegetation clearing procedure (refer to Section 7.4.4). In the event that a threatened species is identified in a hollow, the Project Ecologist will determine the next steps to be undertaken, which may include engaging an arborist.	Section 7.4.4

Stakeholder	Comment Raised	GLC Response	Where Addressed
	Section 7.5 states: "Tree protection zones will be established around mature trees to be retained. Tree protection zones should be established in accordance with Australian Standard 4970 – Protection of trees on development sites." It is unclear what qualifies as a 'mature' tree. Tree protection fencing should be installed around trees that are to be retained and where construction works are within or nearby the trees' Tree Protection Zones (as per AS 4970 – 2009. This Tree Protection fencing should be installed under Project Arborist supervision.	'Mature tree' has been defined in Section 7.1 as a tree with a diameter at breast height (DBH) of 15cm or where a suitably qualified arborist or ecologist determines a specific species to be mature at a smaller DBH. Text has been added to Section 7.5 to clarify that tree protection fencing would be undertaken with supervision from the Project Arborist for circumstances where the Tree Protection Zones is encroached by more than 10%.	Section 7.1 and Section 7.5
	Point 23 in Table 11 states: "The Project Ecologist will be present onsite when excavation works are within the critical root zone of native vegetation to confirm if an arborist is required." An ecologist is not qualified to make this determination. I suggest the project arborist is supervising any excavation that encroaches into the Tree Protection Zone by more than 10% (i.e. representing 'major' encroachment' as per AS 4970 - 2009). I also note that 'critical root zone' is not a term used in AS 4970 – 2009, i.e. it is unclear what this term refers to. The two relevant terms used are Tree Protection Zone (TPZ) and Structural Root Zone (SRZ).	The 'critical root zone' has been revised to 'tree protection zone' throughout the document. Point 23 has been revised to state that the Project Arborist will be present when excavation requires encroachment of more than 10% of the tree protection zone.	Section 7.1
	Point 24 in Table 11 – reference should be made that the cutting of roots should be undertaken by the Project Arborist or supervised by the Project Arborist.	Point 24 has been revised to state that the Project Arborist will be responsible for undertaking the cutting of roots,or overseeing the cutting of roots when appropriate.	Section 7.1

Stakeholder	Comment Raised	GLC Response	Where Addressed
	Point 27, 28 and 29 of Table 11 and section 8 should include a requirement to widen the vegetated riparian zones (VRZ) in accordance with NSW Department of Industry Guidelines for controlled activities on waterfront land - Riparian Corridors (2018). Being a minimum VRZ of 20m for Duck Creek and minimum VRZ of 10m for A'Becketts Creek, so to provide an adequate buffer zone between the proposed stabling and maintenance facility and waterways. In addition, a Vegetation Management Plan rather than a Landscape Plan should be required to guide the renaturalisation and rehabilitation of the two riparian corridors to meet condition C-B2 and C-B10.	The impact has been defined for the Project and outlined in the Minister's Conditions of Approval. Refer to MCoA C-B8, which outlines the requirement for retaining as many mature trees as possible. Renaturalisation and rehabilitation of Duck Creek and A'Becketts Creek is out of scope for the Project and currently Sydney Metro's responsibility. Implementation of a Vegetation Management Plan will be considered if the scope is revised.	Section 8
	The F&F Management Plan should be updated to incorporate the requirement of engaging a Project Arborist to ensure tree protection measures/viable tree retention will be implemented in line with AS 4970 – 2009.	The Project Arborist has been included in Section 10.1, which outlines their role and responsibilities. The Project Arborist will be engaged for any activities that may impact mature trees to be retained.	Section 10.1
	The conditions appear to be silent in terms of what tree species are to be used to offset the lost trees (at a ratio the 2:1). The F&F management plan should specify that these offset trees will be locally native species.	Text has been added to Section 7.4 to clarify that trees to be replaced will be species that are locally native, are urban-resilient, and are likely to provide native fauna habitat and foraging value. Please note that this is out of scope for the Project.	Section 7.4
SOPA	Trees from original Abattoir works and Olympic era street trees. 7.4 Vegetation Clearance – pre clearing procedures (when a nominated SOPA	There will be no trees removed as part of this project scope at Sydney Olympic Park	N/A

Stakeholder	Comment Raised	GLC Response	Where Addressed
	representative would attend). Table 11: Environmental Mitigation & Management Measures also highlights awareness of 'avoiding canopy tree clearing'. SOPA strongly recommends the retention and protection the 500sqm group of Abattoir era urban canopy trees/Olympic street trees adjoining the site.		
	The submitted document appears incomplete with many of the figures and attachments missing. In particular, SOPA would like to see the figure showing the location of where monitoring of groundwater dependent ecosystems will occur.	This comment appears to be referring to a technical error when viewing the document. All figures and attachments are included in the FFMP.	N/A
	Monitoring of work being proposed within the habitats of Sydney Olympic Park should be detailed.	Details of groundwater and groundwater dependant ecosystems monitoring is included within the Groundwater Monitoring Program.	Section 9.1
	The key ecological issue of relevance to SOPA is the impact of groundwater and stormwater discharges to aquatic ecology and the document provides no information on this, instead referring to a separate stormwater sub-plan. There is a risk posed to breeding Green and Golden Bell Frogs in the Northern Water Feature and thus both groundwater and stormwater should be discharged to a creek system rather than to a freshwater wetland.	The Soil and Water Management Sub-plan, Groundwater Monitoring Program and Surface Water Quality Monitoring Program has been prepared for the Project and provided to SOPA for review. No groundwater or stormwater will be discharged into a freshwater wetland at Sydney Olympic Park. If the discharge points at Sydney Olympic Park changes as construction planning progresses, SOPA will be consulted to determine the best approach to minimising risk to Green and Golden Bell Frogs.	N/A
Cumberland City Council	The overall detail of the plan and mitigation measures is generally supported	Noted	N/A

Stakeholder	Comment Raised	GLC Response	Where Addressed
	Council's other interest is in relation to development associated with the Clyde Stabling and Maintenance Facility and any potential effect to Duck River resident Flying Fox colony	Noted. The potential effect to the Duck River resident flying fox colony is outlined in the Approval documents referred to in A1 of the Conditions of Approval and this Flora and Fauna Management Plan. Should a change in the project be required which is not consistent with the Infrastructure Approval, GLC will seek a modification to the Approval as required.	Table 4
	Unfortunately the copy of the file I downloaded didn't provide full resolution to Figure 4 Maps, however I ascertain that the majority of the site will be used for construction and essentially cleared. I raised previously the potential to give back open space as would be available following the completion of development works at the site, around commuter station access and tunnel venting structures etc. In reply I have been advised I would be included in the design process for the landscape treatment of site and look forward to participating in the process. In this regard, I would strongly support the retention and protection of significant trees on the site if at all possible, particularly the eucalypt species, as this would provide an immediate canopy and amenity to an otherwise cleared site	The provision of open space and landscaping as part of the Sydney Metro West Project does not form part of the WTP package and will be delivered by Sydney Metro following these works. In accordance with Condition of Approval D9 and Section 7.4 of this Plan, as many mature trees and as much urban canopy as practicable will be retained during construction. Canopy trimming would be considered where practicable prior to any mature tree removal.	Table 11 Section 7.4.6 & 8.2.1
	Although outside of a direct sphere of influence as located some 800m south west of the construction site, the resident Flying Fox colony over Duck	The EIS and Biodiversity Development Assessment Report (BDAR) assessed that there would be no direct or indirect impacts to the Duck	Table 4

Stakeholder	Comment Raised	GLC Response	Where Addressed
	River may be impacted by noise, light and vibration	River Flying Fox colony as a result of the project. As noted, the Duck River Flying-Fox community is located some distance away, it is also separated from the site by an operational rail corridor (which services the commuter T1 and T2 lines as well as freight movements), arterial roads Parramatta Road and the M4 Motorway and predominantly industrial land use. As such the potential for the Duck River Flying-Fox community to experience noise, light and vibration as a result of the project is highly unlikely. The BDAR identified that there is however some limited foraging habitat for this species. This is considered to be limited to the occasional incidence of individuals utilising the site for foraging. This FFMP has been developed to include provision for management of incidental occurrence of mobile individuals during relevant activities such as vegetation removal.	
	The colony is acknowledged indirectly as part of the plan however I do not see why the colony should not be monitored at intervals throughout the course of construction, to ensure mitigating measures can be undertaken should a disturbance as a result of construction occur	Given that the light, noise and vibration emitted by the construction of the project will not extend to the Flying-Fox colony, monitoring is not required.	N/A
	For reference please find a 2014 Flying Fox Management Plan attached	Noted	N/A
	Also raised in a workshop held in 2021 was the potential to salvage hollow bearing trees for relocation to a nearby bushland site in consultation with the consulting ecologist and Cumberland	Section 5.4.1 outlines the potential for the removal of hollow-bearing trees and notes that only small hollows have the potential to occur within the area, Section 7.4.3.1 also notes that all hollow bearing branches and or hollow bearing trees that have	Section 5.4.1 & 7.4.3.1

Stakeholder	Comment Raised	GLC Response	Where Addressed
		been cleared will be relocated to another area for habitat enhancement.	
	Please ensure the ecologist is aware of this	As above	Section 5.4.1 & 7.4.3.1

Comments Register – Outstanding Issues

Stakeholder	Comment Raised	GLC Response	Proposed Action
N/A			

Meeting Minutes

Copies of Correspondence

Attachment 3 – Permit to Clear Form

Attachment 4 - Pre-Clearing Inspection Checklist

Attachment 5 – Post-Clearing Inspection Checklist

Attachment 6 - Permit to Enter A ‘No-Go’ Zone