

Appendix B8

Waste and Resource Management Sub-plan Infrastructure Works (Package 4)

Parramatta Light Rail – Stage 1

September 2021

PLR1INF-CPBD-ALL-WM-PLN-000001 Rev 11

Construction Environment Management Plan Appendix B8

Waste and Resource Management Sub-plan

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Document Control

The Project Director is responsible for ensuring that this plan is reviewed and approved. The Project Director is responsible for updating this plan to reflect changes to the project, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director and/or client before being distributed / implemented.

Revision	Details
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Rev 1	Second draft submitted to TfNSW. Issued to external stakeholders for consultation.
Rev 2	Incorporation of external stakeholder consultation comments. Submission for ER Endorsement
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Glossary/ Abbreviations

Abbreviations	Expanded text
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval
DPIE	NSW Department of Planning, Industry and Environment
DPSMP	Delivery Phase Sustainability Management Plan
ECM	Environmental Control Maps
EIS	Environmental Impact Statement
ENM	Excavated Natural Material, as defined in <i>The excavated natural material exemption</i>
EPA	NSW Environment Protection Authority
EPL	Environmental Protection Licence
GREP	NSW Government Resource Efficiency Policy
JV, the	CPB Contractors and Downer EDI Works Joint Venture (Parramatta Connect)
REMMM	Revised Environmental Mitigation and Management Measures
Resource	Resource covers energy, fuel, oil, water and other materials used for construction.
Stage 1	Parramatta Light Rail – Stage 1 (Westmead to Carlingford)
SPIR	Submissions and Preferred Infrastructure Report
TfNSW	Transport for NSW
VENM	Virgin Excavated Natural Material
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>
WRMP	Waste and Resource Management Sub-plan

1 Introduction

1.1 Context

This Waste and Resource Management Sub-Plan (WRMP or Sub-plan) forms part of the Construction Environmental Management Plan (CEMP) for the Parramatta Light Rail Stage 1, Package 4 Infrastructure Works (Infrastructure Works). This WRMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA) SSI-8285, the revised environmental mitigation and management measures (REMMMs) and Environmental Performance Outcomes (EPO's) listed in *Parramatta Light Rail Stage 1 Westmead to Carlingford via Parramatta CBD and Camellia Environmental Impact Statement* (the EIS), as amended by the *Parramatta Light Rail (Stage 1) Westmead to Carlingford via Parramatta CBD and Camellia Submissions Report (incorporating Preferred Infrastructure Report)* (February 2018) (the SPIR). In addition, this Sub-plan addresses all applicable legislation and contractual requirements, including the PLR Stage 1 Infrastructure Contract Project Deed (ISD-17-6721).

1.2 Background

1.2.1 Parramatta Light Rail – Stage 1 description

Parramatta Light Rail is one of the NSW Government's major infrastructure projects being delivered to serve a growing Sydney.

Parramatta Light Rail Stage 1 (Stage 1) will connect Westmead to Carlingford via Parramatta Central Business District (CBD) and Camellia. Stage 1 is expected to be operational in 2023.

Stage 1 will create new communities, connect great places and help both local residents and visitors move around and explore what the region has to offer. The route will link Parramatta's CBD and train station to a number of key locations, including the Westmead Precinct, the Parramatta North Growth Centre, the new Western Sydney Stadium, the Camellia Town Centre, the new Powerhouse Museum and Riverside Theatre arts and cultural precinct, the private and social housing redevelopment at Telopea, the Rosehill Gardens Racecourse and the three Western Sydney University campuses.

In summary, the key features of Stage 1 include:

- A new dual track light rail network of approximately twelve (12) kilometres in length, including approximately seven (7) kilometres within the existing road corridor and approximately five (5) kilometres within the existing Carlingford Line and Sandown Line, replacing current heavy rail services
- Sixteen (16) stops that are fully accessible and integrated into the urban environment including a terminus stop at each end of Westmead and Carlingford
- High frequency 'turn-up-and-go' services operating seven days a week from 5am to 1am. Weekday services will operate approximately every 7.5 minutes in the peak period between 7am and 7pm
- Modern and comfortable air-conditioned light rail vehicles, nominally 45 metres long and driver-operated, each carrying up to 300 passengers
- Intermodal interchanges with existing public transport services at Westmead terminus, Parramatta CBD and the Carlingford terminus
- Creation of two light rail and pedestrian zones (no general vehicle access) within the Parramatta CBD along Church Street (generally between Market Street and Macquarie Street) and along Macquarie Street (generally between Horwood Place and Smith Street)

- A Stabling and Maintenance (SaM) Facility located in Camellia for light rail vehicles to be stabled, cleaned and maintained
- New bridge structures along the alignment including over James Ruse Drive and Clay Cliff Creek, Parramatta River (near the Cumberland Hospital), Kissing Point Road and Vineyard Creek, Rydalmere
- Alterations to the existing road network including line marking, additional traffic lanes and turning lanes, new traffic signals, and changes to traffic flows
- Relocation and protection of existing utilities
- Public domain and urban design works along the corridor and at Stop precincts
- Closure of the heavy rail line between Carlingford and Clyde
- Active transport corridors and additional urban design features along sections of the alignment and within Stop precincts
- Integration with the Opal Electronic Ticketing System (ETS)
- Real time information in light rail vehicles and at Stops via visual displays and audio.

An overview of Parramatta Light Rail Stage 1 route is shown in **Figure 1-1**.

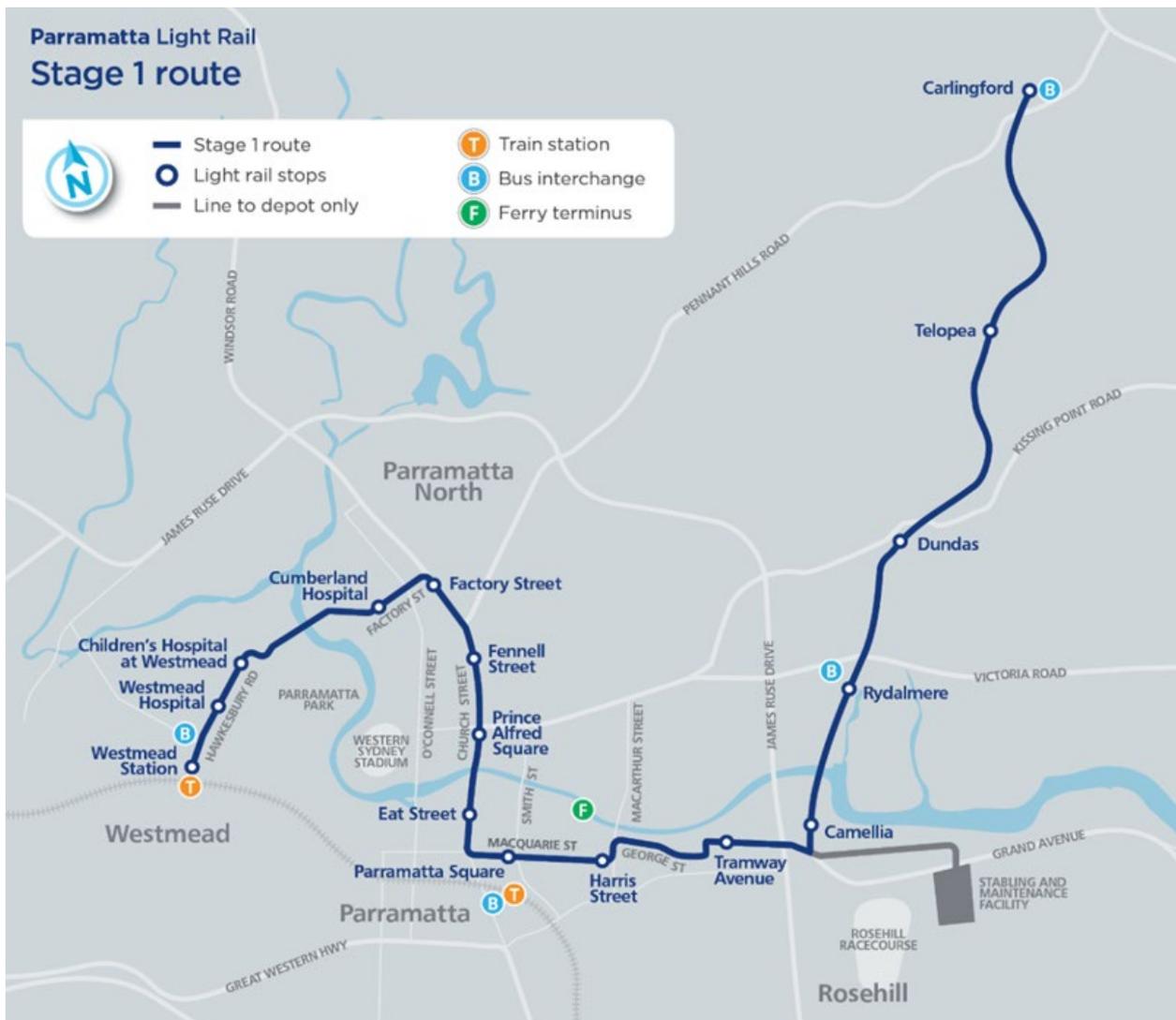


Figure 1-1 Parramatta Light Rail Stage 1 Route

1.2.2 Statutory Context

The Parramatta Light Rail is subject to environmental impact assessment under the *Environmental Planning and Assessment Act 1979* (EP&A Act). It is classified as Critical State Significant Infrastructure (CSSI). The EIS assessed impacts for Parramatta Light Rail Stage 1 (Westmead to Carlingford). This covered the light rail and associated works including road enabling work.

Stage 1 received Infrastructure Approval from the Minister for Planning under Section 5.19 of the EP&A Act on 29 May 2018 (Critical State Significant Infrastructure Application SSI-8285), subject to the conditions provided in the Instrument of Approval, specifically Schedule B – Ministerial Conditions of Approval (CoA).

The Infrastructure Approval was subsequently modified under Section 5.25 of the EP&A Act on 21 December 2018 and 25 January 2019.

The planning approval, modifications and related environmental assessment documents are located at: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8285.

1.2.3 Stage 1 Delivery Strategy

Delivery of Stage 1 is achieved through the following five packages of work:

- Enabling Works (Package 1) – Local road network improvements including O’Connell Street and George Street (off-alignment)
- Westmead Precinct Works (Package 2) – Hawkesbury Road widening and demolition at Cumberland Hospital (east and west Campus)
- Early Works (Package 3) – Remediation of the Stabling and Maintenance (SaM) Facility
- Infrastructure Works (Package 4) (the subject of this Plan) – Design and construction of civil works, public domain and light rail infrastructure up to road level/top of rail and to the top of the concrete slab at stops, including provision of utility services (excluding high-voltage power supply and cabling for rail systems), and decommissioning of the T6 Carlingford Line
- Supply, Operate and Maintain Works (Package 5) – Design and construction of the light rail systems, high-voltage power supply and stops above slab level, the supply of light rail vehicles, and the design and construction of the SaM Facility, including all light rail operations, customer service and asset management.

Each package of work is to be delivered under separate contracts on behalf of the proponent Transport for NSW (TfNSW). While the packages will commence at different times under separate construction approvals, there will be periods during which the packages works will overlap. The interactions between the packages are shown in **Figure 2-2**.

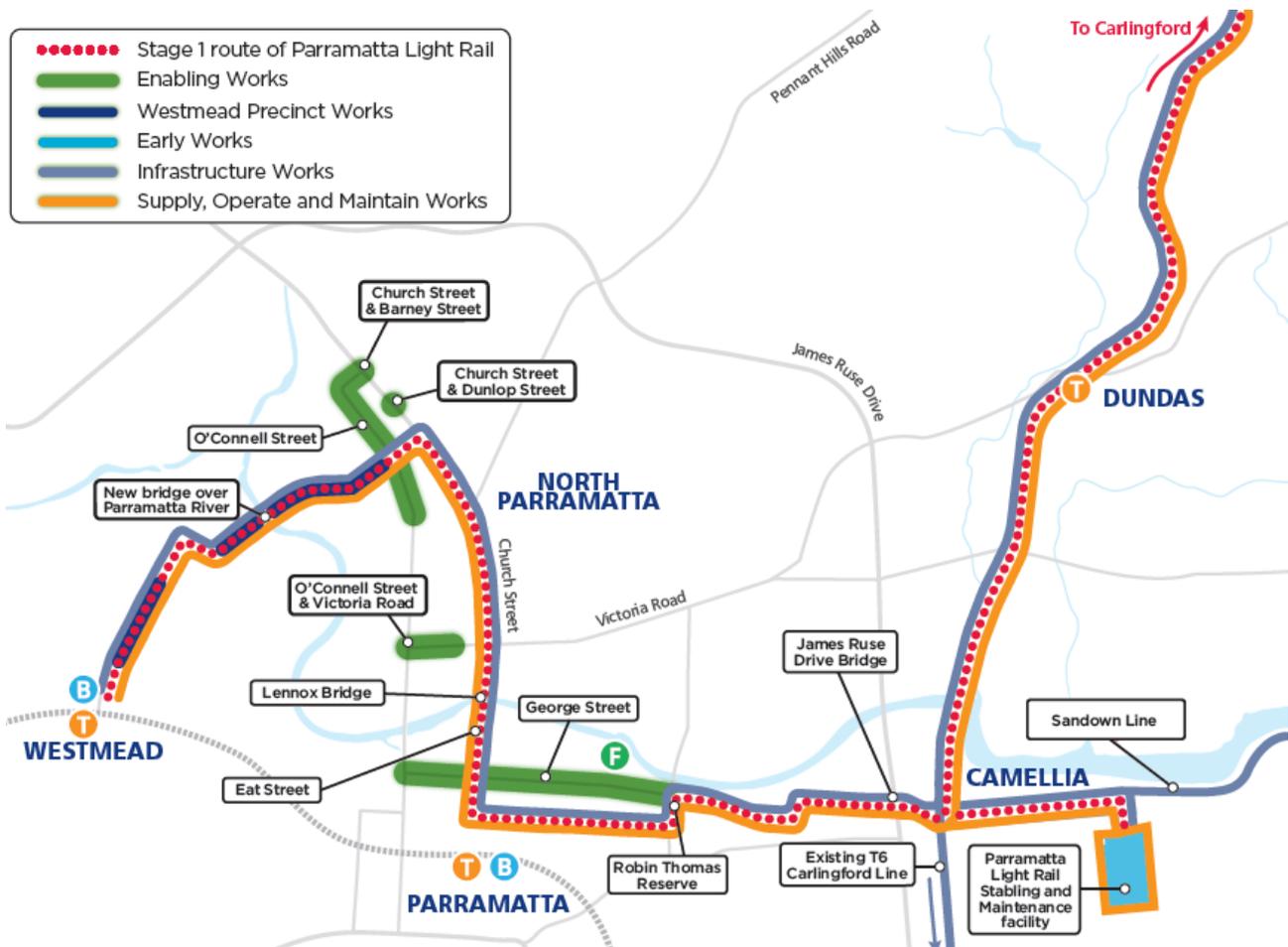


Figure 1-2 Parramatta Light Rail Stage 1 Delivery Strategy

1.3 Infrastructure Works

The CPB Contractors and Downer EDI Works Joint Venture (JV), Parramatta Connect, has been engaged to deliver Package 4 – Infrastructure Works (Infrastructure Works). In summary the Infrastructure Works include:

- Utility services adjustment and relocation works (for more than minor impact)
- Property demolition to make space for the light rail tracks and ancillary facilities
- Decommissioning of the existing Carlingford T6 heavy rail line and disused Sandown Line
- Earthworks and retaining structures
- Drainage works
- Intersection signalling works
- The light rail civil infrastructure and stop slabs
- Urban and architectural design and finishes of the corridor and public domain
- Rail, track slabs, ballasted track and grass tracks
- Footpath and kerb realignment including intersection works and road upgrades to accommodate light rail and other traffic (both temporary and permanent)
- New light rail bridges carrying the light rail over the Parramatta River (at Cumberland Hospital), James Ruse Drive, Vineyard Creek and Kissing Point Road and bridge strengthening and modifications to existing bridges as required

- Provision of the Active Transport Link for pedestrians and cyclists
- Staff and passenger facilities at each light rail terminus
- Rail/road interaction including traffic signals and road sharing
- Testing and commissioning of the Infrastructure Works.

1.4 Relationship with SOM

The Infrastructure Works is closely aligned to the Package 5, Supply, Operate and Maintain (SOM) Works which is being delivered by the Great River City Light Rail consortium. A graphical representation of the split in scope between the two packages is depicted in **Figure 1-3**.

The reasoning for dividing this work into two stages is to ensure that suitably qualified and experienced sub-contractors are in place for each specialised component; civil infrastructure, and operational systems. The Infrastructure Works will deliver the civil infrastructure components of Stage 1 and will not trigger the operational conditions with the exception of those that relate to detailed design.

An interface between the two Joint Ventures has been established to monitor cumulative impacts and the coordination of environmental complaints management, site management controls, and the delineation of incident reporting and non-conformance management. Opportunities to share information, materials and resources will also be explored to support achievement of waste and resource minimisation targets.

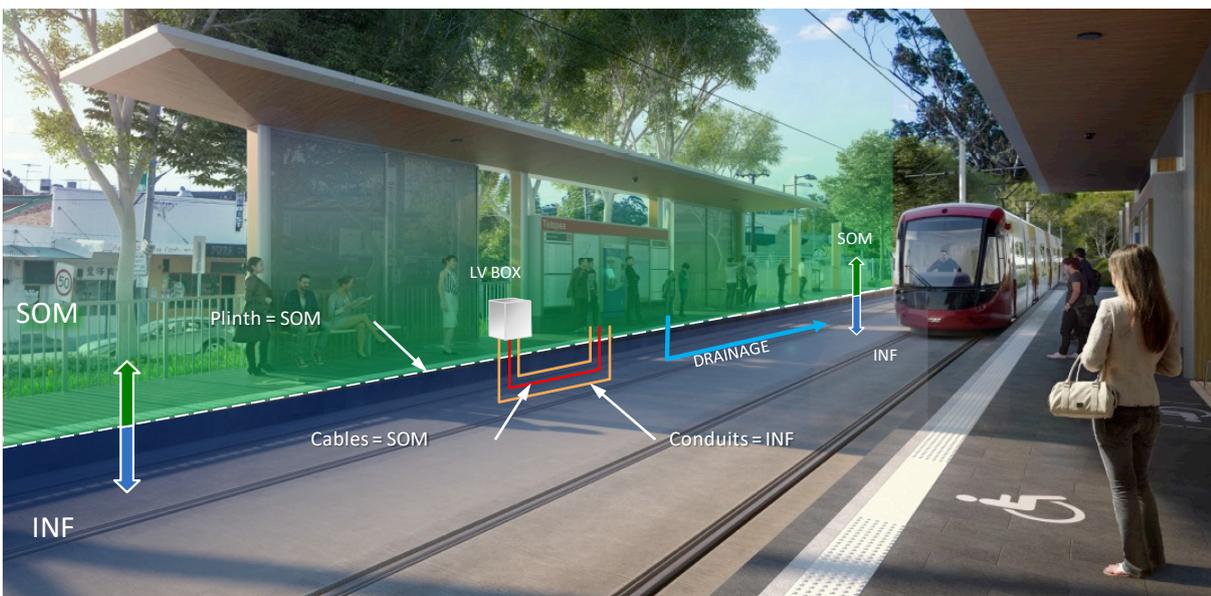


Figure 1-3 Relationship Between Infrastructure Works and the Supply, Operate and Maintain Works

1.5 Scope of the Sub-Plan

This Sub-plan outlines the mitigation and management measures the CPB Contractors and Downer EDI Works Joint Venture (the JV) will use to address potential impacts arising from waste generation and resource consumption during design and construction of the Infrastructure Works, while complying with relevant approval, statutory and contract requirements. Sections 3.2, 3.3 and 3.4 provide compliance tables identifying where in this Sub-plan relevant requirements are addressed.

This Sub-plan is applicable to all activities during construction of the Infrastructure Works, including all areas where physical works will occur or areas that may be otherwise impacted by the

construction works, and under the control of the JV. All the JV staff and sub-contractors are required to operate fully under the requirements of this Sub-plan and related environmental management plans, over the full duration of the construction program.

This Sub-plan is intended to be implemented in parallel with the Waste Management Plan (PLR1INF-CPBD-ALL-WM-PLN-000002) which has been prepared in accordance with Environment Protection Licence 21347. For completeness, waste management and mitigation measures defined in EPL 21347 are also captured in this Sub-plan.

1.6 Environmental management systems overview

The environmental management system overview is described in Section 1.5 of the CEMP and detailed in **Figure 1-4**.

Key interactions for this Sub-plan with other management plans include:

- Contaminated Land Management Sub-plan which details the controls and requirements for managing contaminated soils and asbestos
- Soil and Water Management Plan which addresses chemical storage and spill response and stockpile management
- Delivery Phase Sustainability Management Plan which defines the sustainability targets, addresses the tracking and reporting of waste and energy, and provides detailed strategies to achieve resource reductions
- Safety Management Plan details the procedures for managing asbestos containing materials.

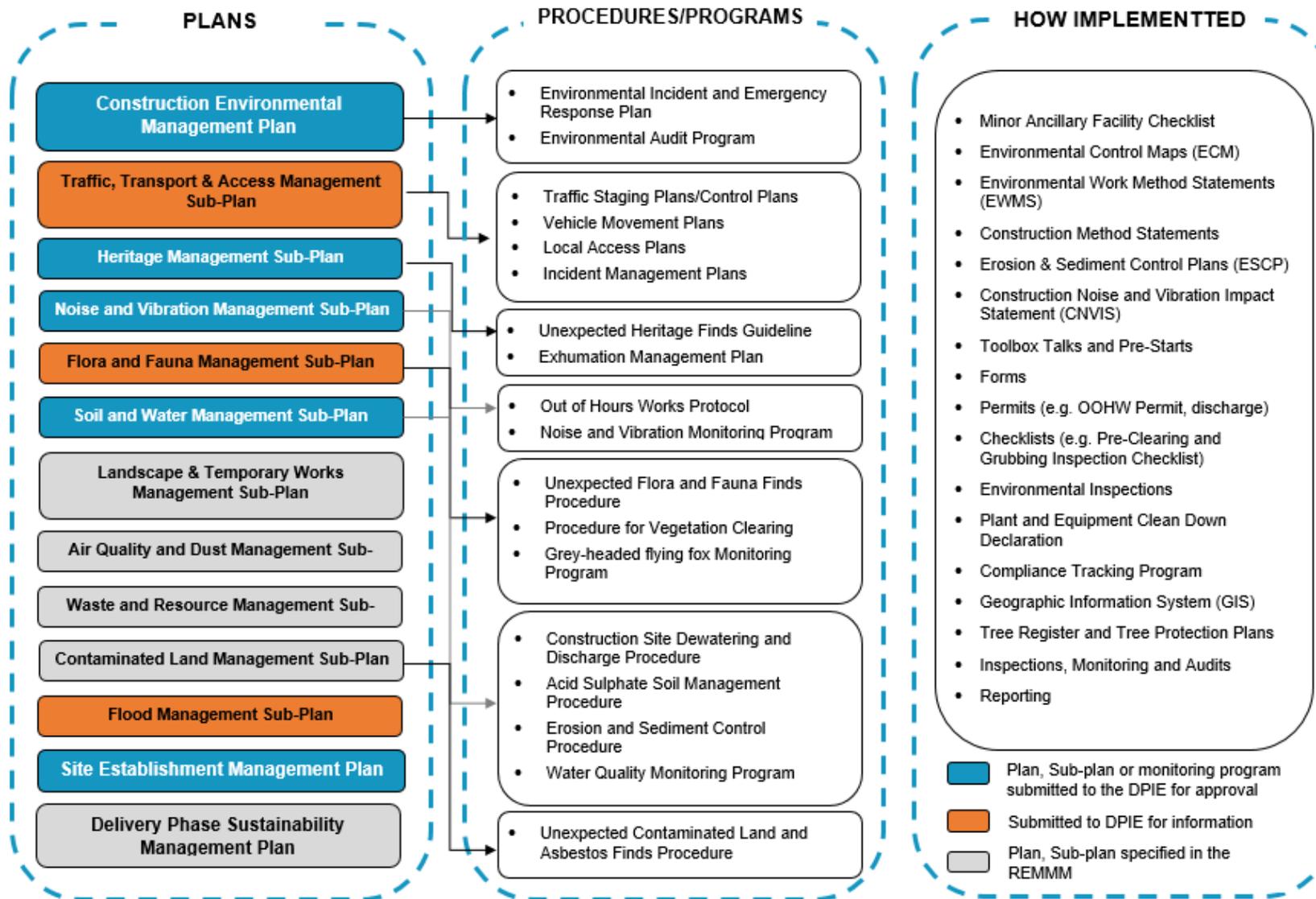


Figure 1-4 Environmental Management System

2 Purpose and objectives

2.1 Purpose

The purpose of this Sub-plan is to describe how the JV proposes to manage waste and resources during the Infrastructure Works.

2.2 Objectives

The key objective of the WRMP is to ensure all CoA, REMMMs, EPOs and licence/permit requirements relevant to waste and resources are described, scheduled and assigned responsibility as outlined in:

- The environmental impact assessment prepared for Parramatta Light Rail Stage 1
- Conditions of Approval granted to the project on 29 May 2018
- Transport for NSW's Air Quality Management Guideline 9TP-SD-107/3.0
- Parramatta Light Rail Stage 1 Submissions and Preferred Infrastructure Report
- PLR Stage 1 Infrastructure Contract Project Deed (Project Deed)
- PLR Sustainability Strategy
- EPL 21347.

2.3 Targets

The waste minimisation and resource conservation targets detailed in **Table 2-1** have been established to:

- Avoid the unnecessary production of waste where practical to do so
- Encourage resource conservation
- Promote innovation in waste re-use/recycling
- Comply with the key goals as outlined in the PLR Stage 1 Sustainability Strategy.

Table 2-1 Waste and Resource Targets

Waste and Resource Targets	Target	Aspirational
Percentage of usable spoil (surplus excavated material) reused/recycled.	100%	100%
Percentage of paving and other reusable materials that are reused.	100%	100%
Percentage of construction and demolition waste (material excluding spoil) reused/recycled.	95%	>95%
Percentage of office waste (uncontaminated material) reused/recycled.	60%	70%
Percentage of topsoil that remains productive at completion of construction.	95%	100%

Waste and Resource Targets	Target	Aspirational
Percentage of non-potable water which is used for Contractor's activities.	50%	60%
Reduction in project water use	15%	20%
Reduction in project lifecycle greenhouse gas emissions.	20%	25%
Offset a minimum of the total electricity used in construction through either one or a combination of the following: <ul style="list-style-type: none"> a) purchase of Australian Carbon Offset Credits (defined as eligible offsets under the National Carbon Offset Standard) b) purchase of renewable energy from an Accredited Renewable Energy Supplier. 	25%	30%

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1. Legislation

Legislation relevant to waste and resource management include:

- *Environmental Planning and Assessment Act 1979* (EPA Act)
- *Protection of the Environment Operations Act 1997* (POEO Act)
- Protection of the Environment Operations (Waste) Regulation 2014
- *Waste Avoidance and Resource Recovery Act 2001* (WARR Act)
- *Contaminated Land Management Act 1997* (CLM Act)
- *Biosecurity Act 2015*
- Work Health and Safety Regulation 2011
- *National Greenhouse and Energy Reporting Act 2007*
- *Environmentally Hazardous Chemicals Act 1985*.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the CEMP.

3.1.2. Guidelines and standards

The main guidelines, specifications and policy documents relevant to this Sub-plan include:

- NSW Waste and Resource Recovery Strategy 2014-21 (EPA, 2014)
- NSW Government Resource Efficiency Policy (GREP) (OEH 2014)
- Waste Classification Guidelines (EPA 2014)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 1999)
- Guidelines on Resource Recovery Orders and Exemptions (EPA, 2015)
- Environmental Best Practice Guidelines for Concreting Contractors (DEC 2004)
- Australia Dangerous Goods Code Edition 7.3 (ADG 7.3) (National Transport Commission 2014)
- PLR Stage 1 Sustainability Strategy
- IS Technical Manual v1.2
- BS 8903:2010 Principles and Framework for Procuring Sustainably – Guide
- ISO 20400 Sustainable Procurement – Guidance.

3.2 Minister's Conditions of Approval

The CoA relevant to this Sub-plan are listed in **Table 3-1** below. A cross reference is also included to indicate where the condition is addressed in this Sub-plan or other project management documents.

Table 3-1 Conditions of Approval relevant to the WRMP

CoA No.	Condition Requirements	Document Reference	How Addressed
C4	The CEMP Sub-plans must state how:	-	-
C4 a)	The environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;	Section 3.4	The relevant environmental performance outcomes for the Infrastructure Works are outlined in Section 3.4 together with actions taken to achieve implementation.
C4 b)	The mitigation measures identified in the documents listed in Condition A1 will be implemented;	Section 3.3 Section 7	The waste and resource initiatives that are identified in the documents listed in Condition A1 are reflected in the waste and resource management measures and controls listed in Section 7 in Table 7-1 . These will be implemented during pre-construction and construction phases and communicated through the processes described in Section 8.2.
C4 c)	The relevant terms of this approval will be complied with; and	Section 3.2	The terms of this approval are outlined in Section 3 and will be complied with through the preparation and implementation of this Sub-plan.

CoA No.	Condition Requirements	Document Reference	How Addressed
C4 d)	Issues requiring management during construction, as identified through ongoing environmental risk analysis, will be managed.	Section 4.2 Table 7.1	<p>Issues that require management during construction are outlined in Section 1.1 as well as their predicted impact.</p> <p>The process for ongoing environmental risk analysis is outlined in the CEMP in Section 1.5.1 and 3.1.1. The environmental risk register for the Infrastructure Works is detailed in the CEMP (Appendix A2). The risk register is reviewed annually, at minimum, and in response to significant issues, incidents and non-compliances.</p> <p>The management of these risks has been outlined in Table 7-1. These will be implemented during pre-construction and construction phases of the Infrastructure Works.</p>
E127	Waste generated during construction and operation must be managed in accordance with the following priorities:	Table 7-1	<p>The management measures that will be applied to waste generated during construction are detailed in Table 7-1.</p> <p>Management will include the prioritisation of waste according to the principles of the resource management hierarchy.</p>
a)	Waste generation must be avoided and where avoidance is not reasonably practicable, waste generation must be reduced;	Section 5.1 Table 7-1	<p>Where possible, the production of waste will be avoided and reduced as outlined in Section 5.1.</p> <p>Table 7-1 details the mitigation measures that will be undertaken to avoid and reduce the generation of waste.</p>
b)	Where avoiding or reducing waste is not possible, waste must be re-used, recycled, or recovered; and	Section 5.1 Table 7-1	<p>Strategies for waste reuse, recycling and recovery (where avoidance is not possible) are outlined Section 5.1.</p> <p>Table 7-1 details mitigation and management measures that will be undertaken to avoid and reduce the generation of waste (WM05, WM14, and WM25).</p>

CoA No.	Condition Requirements	Document Reference	How Addressed
c)	Where re-using, recycling or recovering waste is not possible, waste must be treated or disposed of.	Section 5.1 Table 7-1	Waste treatment and disposal processes will be utilised when reuse, recycling or recovery is not feasible. These methods are outlined in Section 5.1 and detailed in Table 7-1 (WM13 and WM29).
E128	The importation of waste and storage of virgin excavated natural material (VENM), treatment, processing, reprocessing or disposal of any waste, must comply with the <i>Protection of the Environment Operations Act 1997</i> , and the <i>Protection of the Environment Operations (Waste) Regulation 2014</i> , where orders or exemptions apply under the regulation.	Section 3.1 Section 5.1 Section 5.2 Appendix C	<p>The waste storage, treatment, processing and disposal protocols, as outlined in Section 3.1, Section 5.1 and Section 5.2, have been developed in compliance the <i>Protection of the Environment Operations Act 1997</i>, and the <i>Protection of the Environment Operations (Waste) Regulation 2014</i>.</p> <p>Implementation is demonstrated through VENM and ENM certificates (where material is imported) and Material Movement Permits/Material Tracking Forms (where material is treated or disposed). The Material Movement Permit and the Material Tracking Form are provided in Appendix C.</p> <p>Compliance against the requirements of this condition is assessed through monthly waste management reviews (as required by EPL 21347, condition O4.3) and audits (refer to the CEMP, Section 3.8.4).</p>

CoA No.	Condition Requirements	Document Reference	How Addressed
E129	Waste must only be exported to a site licensed by the EPA for the storage, treatment, processing, reprocessing or disposal of the subject waste, or in accordance with a Resource Recovery Exemption or Order issued under the <i>Protection of the Environment Operations (Waste) Regulation 2014</i> , or to any other place that can lawfully accept such waste. Disposal of waste at these facilities must include GPS tracking of waste vehicles, audits of waste facility receipts and cross verification with the facility. All asbestos waste over 10m ³ must be tracked through EPA's WasteLocate service.	Section 5.1.3 Section 5.4 Table 7.1 Appendix C	The storage, treatment and disposal of waste off-site will only occur at a facility licensed by the EPA. To ensure waste management practices are being followed, GPS tracking of waste vehicle will occur as well as audits of waste facility receipts. Waste disposal requirements are outlined in Section 5.1.3, Section 5.4 and Table 7.1 (WM08, WM17, WM19 and WM 20). Implementation is demonstrated through Material Movement Permits/Material Tracking Forms (Appendix C). Compliance against the requirements of this condition is assessed through monthly waste management reviews (as required by EPL 21347, condition O4.3) and audits (refer to the CEMP, Section 3.8.4).
E130	All waste must be classified in accordance with the EPA's Waste Classification Guidelines, with appropriate records and disposal dockets retained for audit purposes	Section 5.2 Table 7.1	All waste will be classified in accordance with the EPA's Waste Classification Guidelines as summarised in Section 5.2. Relevant documents and disposal dockets will be retained for audit purposes (Table 7.1, WM17).

CoA No.	Condition Requirements	Document Reference	How Addressed
E131	Asbestos or asbestos-contaminated materials that are discovered during demolition and construction activities of the CSSI must be strictly managed in accordance with the requirements under the Protection of the Environment Operations (Waste) Regulation 2014 and any guidelines or requirements in force at the date of this approval and issued by the EPA in relation to those materials	Section 5.2 Section 5.3 Contaminated Land Management Sub-plan (Section 7.3)	<p>Processes for the handling of asbestos contaminated materials are detailed in Section 5.2 and Section 5.3.</p> <p>The management of asbestos or asbestos-contaminated materials will occur by appropriately qualified and licensed contractors, in accordance with the required guidelines.</p> <p>The waste classification guidelines outlined in Section 5.2 will be followed to ensure waste is correctly categorised prior to treatment, storage or disposal.</p> <p>This has been included as mitigation measure WM08 and is addressed in detail in the Contaminated Land Management Plan (Section 7.3).</p>

3.3 Revised Environmental Mitigation and Management Measures

Relevant REMMMs are listed in **Table 3-2** below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

Table 3-2 Revised Environmental mitigation and management measures relevant to this WRMP

Ref #	Commitment	Timing	WRMP Reference	How Addressed
WM-1	<p>During detailed design and detailed construction planning, the following resource and material minimisation initiatives would be explored, and if determined to be reasonable and feasible, implemented:</p> <ul style="list-style-type: none"> • Use of recycled materials, such as the maximum permitted recycled content for asphalt and concrete (including use of fly ash and blast furnace slag) • Use of modular, prefabricated and precast structural and finishing materials • Use of wastewater or recycled water to reduce potable water demand during construction and operation • Rainwater harvesting infrastructure at the stabling and maintenance facility to provide non-potable water for operational uses. 	Pre-construction	Table 6-1 Table 7-1	<p>Resource and material minimisation initiatives will be explored and implemented where reasonable and feasible, including:</p> <ul style="list-style-type: none"> • fly ash and blast furnace slag in concrete (Table 6-1) • prefabricated materials (Table 7-1, WM03) • recycled materials (Table 6-1) • recycled water (Table 6-1) • water efficient fixtures and fittings (Table 6-1) • rainwater harvesting (Table 6-1)

Ref #	Commitment	Timing	WRMP Reference	How Addressed
WM-2	<p>A waste and resource management plan would be prepared for the project as part of the overall CEMP. This plan would set out details for managing waste generation and resource consumption. The plan would be informed by the Parramatta Light Rail Sustainability Plan and the requirements of the <i>Waste Avoidance and Resource Recovery Act 2001</i>.</p> <p>The objectives and strategies of the waste and resource management plan would include the following:</p>	Pre-construction	Table 7-1	<p>The WRMP has been developed in accordance with the relevant guidelines.</p> <p>Management controls and procedures for managing waste generation and resource consumption are provided in Table 7-1.</p>
WM-2	<p>Construction waste would be managed through the waste hierarchy established under the <i>Waste Avoidance and Resource Recovery Act 2001</i> management hierarchy.</p>	Construction	<p>Section 5.1</p> <p>Table 7-1</p> <p>Section 8.2</p>	<p>The waste management hierarchy is detailed in Section 5.1.</p> <p>Key requirements of the waste management hierarchy will be communicated to workers through the site induction, toolbox talks, daily pre-starts and within relevant ECMs (Section 8.2 of this Sub-plan and described in detail in the CEMP, Section 3.1.4 and Section 3.4).</p> <p>This has been included as mitigation measure WM01 and WM02 (Table 7-1).</p>

Ref #	Commitment	Timing	WRMP Reference	How Addressed
WM-2	Classification of waste during construction in accordance with the current guidelines.	Construction	Section 5.2	<p>All waste will be classified following the EPA's Waste Classification Guidelines and the Waste Classification Procedure.</p> <p>The waste classification guidelines outlined in Section 5.2 will be followed to ensure waste is correctly categorised prior to treatment, storage or offsite disposal. Communication of guidelines will occur during toolbox talks, daily pre-starts and will be documented on ECMs.</p> <p>This has been included as mitigation measure WM13.</p>
WM-2	Segregation of waste into stockpiles of spoil, concrete, steel, timber, paper and cardboard and vegetation to make it easier to recycle components and prevent cross contamination.	Construction	Section 5.1	<p>Waste will be segregated into stockpiles or receptacles to facilitate recycling and prevent cross contamination. The measures outlined in Section 5.1 will be followed to ensure waste is correctly separated. Dedicated waste storage areas will be established for each waste material to aid this process.</p> <p>Separation protocols will be communicated through toolbox talks, daily pre-starts and documented in the ECM for relevant sites.</p> <p>This has been included as mitigation measure WM14.</p>

Ref #	Commitment	Timing	WRMP Reference	How Addressed
WM-2	Procurement of materials would be carried out on an 'as needed' basis to reduce over-ordering and wastage, and exploring opportunities to reuse materials, where applicable.	Construction	Table 7-1	Materials will be ordered when required. Table 7-1 details the management measures that will be undertaken to reduce wastage and promote reuse or recycling of materials. This has been included as mitigation measure WM04.
WM-2	Targets for the recovery, recycling or reuse of construction waste, and beneficial reuse of spoil. A Construction Waste and Reuse Plan (this plan) would be prepared as part of the CEMP. It would ensure resource and materials use, waste disposal and energy use is minimised by tracking and reporting performance, and applying corrective action as required.	Pre-construction Construction	Section 2.3 Section 5.1	Targets for recycling and reuse of construction waste and spoil are outlined in Section 2.3. Strategies to achieve these targets are outlined in Section 5.1. Regular inspections and audits will be conducted to ensure waste disposal and resource use is minimised. Tracking and reporting performance on waste disposal and energy use and applying corrective action as required is addressed in the Delivery Phase Sustainability Management Plan (Section 6.2). A cross-reference is included in Section 1.6 of this Sub-plan.
WM-2	Identification of carbon and energy strategies and initiatives to minimise carbon and energy use associated with construction (e.g. selection of equipment, inclusion of renewable energy sources to power temporary facilities and equipment, designing site offices for energy efficiency, and efficient operation of vehicles and equipment).	Pre-Construction Construction	Section 6	The project team will implement resource conservation practices where possible to minimise carbon and energy use. Section 6 details the energy efficient work practices that will be implemented. Adherence to these protocols will be ensured through ongoing communication and awareness initiatives.

Ref #	Commitment	Timing	WRMP Reference	How Addressed
WM-2	Consideration of materials mitigation and management measures including use of recycled materials, recycling and reuse of materials on site, use of materials with lower embodied impact, and consideration of whole of life costs during procurement.	Construction	Section 5 Section 6 Table 7-1 Delivery Phase Sustainability Management Plan	<p>Table 7-1 details the mitigation and management measures to reduce the impact of waste materials.</p> <p>Section 5 and Section 6 outlines the protocols for material reuse and recycling and resource conservation. These protocols will be communicated during the site induction, toolbox talks, and daily pre-starts and will be documented within the relevant ECMs.</p> <p>This has been included as mitigation measure WM05, WM06, WM09 and WM14.</p> <p>The use of materials with lower embodied impact and consideration of whole of life costs during procurement is addressed in the Delivery Phase Sustainability Management Plan (Section 4.1, 4.2 and 5.1.4)</p>
WM-2	Prior to disposal/removal or reuse off-site, all wastes would be classified in accordance with the waste classification guidelines (Waste Classification Guidelines (OEH, 2016) and Waste Avoidance and Resource Recovery Strategy 2014-2021 (EPA, 2014) to ensure the most appropriate disposal or reuse option.	Construction	Section 5.2	<p>Onsite waste classification will be conducted in accordance with the waste classification guidelines.</p> <p>The waste classification guidelines outlined in Section 5.2 will be communicated during the site induction, toolbox talks and daily pre-starts and documented in ECMs for specific work areas to ensure waste is correctly categorised prior to treatment, storage or disposal.</p>

Ref #	Commitment	Timing	WRMP Reference	How Addressed
WM-2	Monitoring and compliance requirements.	Pre-Construction	Section 7 Section 8.3 Section 1.1	<p>All employees and subcontractors working on site will undergo site induction training relating to waste and energy conservation.</p> <p>In accordance with the audit program (refer to the Section 8.4 and the CEMP, Section 3.8.4), audits will focus on compliance, WRMP implementation and sub-contractor performance.</p>
WM-3	The project would achieve a diversion rate for construction waste from landfill of a minimum of 90 per cent of waste by volume, with a target of 95 per cent. The project would also reuse 100 per cent of paving and other reusable materials or facilitate reuse of such materials. Contaminated waste which cannot be diverted from landfill would be excluded from this calculation. Where targets cannot be achieved, the project must demonstrate all feasible measures have been taken to achieve as close to the targets as possible.	Construction	Section 2.3 Table 5-1 Table 5-2 Table 6-1	<p>Targets for the Infrastructure Works are outlined Section 2.3. The targets will be achieved through the measures detailed in Table 5-1, Table 5-2 and Table 6-1.</p> <p>Targets will be communicated to relevant staff during the site induction, toolbox talks and daily pre-starts and documented on ECMs for specific work areas.</p> <p>Tracking and reporting performance against targets is addressed in the Delivery Phase Sustainability Management Plan (Section 6.2). A cross-reference is included in Section 1.6 of this Sub-plan.</p>

Ref #	Commitment	Timing	WRMP Reference	How Addressed
WM-4	Construction waste would be segregated and stockpiled on site, with materials such as bricks and tiles, timber, plastic, metals and existing track materials (such as rail and ballast materials) being separated where practicable and sent to a waste facility with recycling capabilities.	Construction	Table 7-1	<p>Waste will be segregated into stockpiles or other receptacles prior to being transported offsite to a waste facility, as outlined in Section 5.1.</p> <p>Dedicated waste storage areas with clear labelling will be established for each waste stream to aid in recycling and disposal.</p> <p>Separation protocols will be communicated through the site induction, toolbox talks, daily pre-starts and will be documented in ECMs for specific work areas.</p> <p>This has been included as mitigation measures WM14 and WM15.</p>
WM-5	The disturbance, movement and disposal of asbestos containing materials would be carried out in accordance with the <i>Work Health and Safety Regulation 2011</i> and other relevant guidelines.	Construction	Section 5.1 Table 7-1	<p>The handling and disposal of asbestos and clinical wastes will be managed in accordance with the relevant guidelines.</p> <p>Section 5.1 outlines waste handling procedures that will be communicated to staff through the site induction, toolbox talks, and daily pre-starts and will be documented in the ECMs for specific work areas.</p> <p>This has been included as mitigation measure WM08 and is addressed in detail in the Contaminated Land Management Plan (Section 7.3).</p>

Ref #	Commitment	Timing	WRMP Reference	How Addressed
WM-6	Where possible and fit for purpose, spoil would be beneficially reused within the project before off-site reuse or disposal options are pursued.	Construction	Table 7-1 Appendix A – Spoil Management Strategy	<p>Spoil will be reused within the project footprint if feasible, otherwise it will be transferred off-site for reuse or disposal.</p> <p>The strategies for spoil management are outlined in Appendix A – Spoil Management Strategy.</p> <p>This will be communicated to relevant staff through the site induction, toolbox talks, daily pre-starts and will be documented in the ECMs for specific work areas.</p> <p>This has been included as mitigation measure WM25.</p>
WM-6	A spoil management strategy would be developed prior to the commencement of construction and implemented during construction. The strategy would identify spoil disposal sites and describe the management of spoil on-site and during off-site transport.	Pre-Construction; Construction	Table 7-1 Appendix A – Spoil Management Strategy	<p>The strategies for spoil management are outlined in Appendix A – Spoil Management Strategy.</p> <p>This has been included as mitigation measure WM25.</p>
HY-6	Excavate pre-classified contaminated materials and transfer such materials directly into haulage trucks for off-site disposal at a waste facility licensed to accept the contaminated material.	Construction	Section 5 Contaminated Land Management Sub-plan Table 7-1	<p>Pre-classified contaminated materials will be immediately transferred into haulage trucks and disposed of once excavated.</p> <p>Handling and disposal procedures for managing pre-classified contaminated materials is outlined in the Contaminated Land Management Sub-plan.</p> <p>This has been included as mitigation measure WM29.</p>

Ref #	Commitment	Timing	WRMP Reference	How Addressed
HY-6	Where possible, reuse excavated materials as fill on other parts of the project in preference to disposing off-site in accordance with OEH's Waste Classification Guidelines (2016).	Construction	Table 7-1	A Spoil Management Strategy (Appendix A) has been prepared to guide the beneficial reuse of excavated materials across the project. This requirement has been included as mitigation measure WM-25.

3.4 Environmental Performance Outcomes

Relevant Environmental Performance Outcomes (EPOs) are listed in **Table 3-3** below. This includes reference to requirement outcomes, the timing of when the commitment applies, and relevant documents or sections of the environmental assessment influencing the outcome and implementation.

Table 3-3 Environmental Performance Outcomes relevant to this WRMP

EPO Ref	Environmental Performance Outcome	Timing	WRMP reference	How Addressed
EPO-SG-3	Any contamination on project sites would be remediated to suit future land use.	Construction	Section 5.2 Contaminated Land Management Plan	Waste classification, including contaminated waste, is addressed in Section 5.2. Detailed requirements associated with the investigation and remediation of contaminated sites is detailed in the Contaminated Land Management Plan.
EPO-SU-1	The project would be carried out in accordance with the Parramatta Light Rail Sustainability Strategy.	Pre-construction Construction	CEMP Section 3.1.2 Table 5-1 Table 5-2 Table 6-1	This EPO is an overarching performance criterion of the CEMP and is a goal of the waste management hierarchy. The PLR Stage 1 Sustainability Strategy is referenced in Section 3.1.2 and measures to achieve implementation are detailed in in Table 5-1, Table 5-2 and Table 6-1.
EPO-SU-2	The project would comply with the relevant requirements of the NSW Government Resource Efficiency Policy.	Pre-construction Construction	Section 6	Relevant requirements of the GREP have been addressed in Table 6-1 of this Plan. Remaining initiatives are captured within the Delivery Phase Sustainability Management Plan, including reporting requirements (Section 6.2).

4 Environmental aspects and impacts

4.1 Construction waste streams and resource use

The following potential construction related waste streams have been identified:

- Demolition wastes from existing structures that require demolition, pipe work, pavements and concrete pathways
- Steel from reo and other sources as well as steel from rail
- Excavation wastes including usable spoil such as ENM/VENM (subject to waste classification)
- Contaminated/unsuitable spoil material, such as excavated materials from the existing (and former) rail corridors or industrial areas
- Potential asbestos containing materials from excavation and the demolition of existing buildings or structures
- Vegetation from removal of shrubs and trees
- Packaging materials associated with items delivered to site such as pallets, crates, cartons, plastics and wrapping materials
- Wastes produced from the maintenance of various heavy construction equipment including liquid hazardous wastes from cleaning, repairing and maintenance
- Non-hazardous wastes from worker's facilities such as toilets
- General wastes including office wastes, scrap materials and biodegradable wastes.

The following materials have been identified that will be consumed during the Infrastructure Works:

- Prefabricated steel furniture and signage
- Liquid fuel (diesel and petrol)
- Lubricating oil
- Premix concrete
- Road sub-base and road base
- Timber/plywood
- Rock gabions
- Asphalt and bitumen
- Bentonite
- Concrete, sand and cement
- Precast concrete pipes and conduits
- Paving stones
- PVC conduit
- Paint
- Sleepers and ballast
- Structural fill (where existing subgrade material is not suitable)
- Energy
- Water.

4.2 Impacts

The potential environmental impacts associated with construction waste generation and resource use include:

- Generation of construction waste
- Generation of excavated soil and rock
- Generation of vegetation waste from corridor clearing
- Generation of domestic waste from construction personnel
- Consumption of non-renewable resources such as energy, diesel and other chemicals (mitigation measures addressed in the Delivery Phase Sustainability Management Plan)
- Greenhouse gas emissions due to consumption of energy from non-renewable resources (mitigation measures addressed in the Delivery Phase Sustainability Management Plan).

5 Waste management

5.1 Waste management hierarchy

Waste management for the Infrastructure Works will adopt the principles of the waste management hierarchy as embodied in the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) and the *Protection of the Environment Operations Act 1997* (POEO Act). The hierarchy, depicted in **Figure 5-1**, focusses on avoidance and resource recovery practices in preference to disposal.

The JV is committed to the objectives of responsible management of waste and will ensure that the Infrastructure Works complies with this hierarchy and waste management compliance obligations.

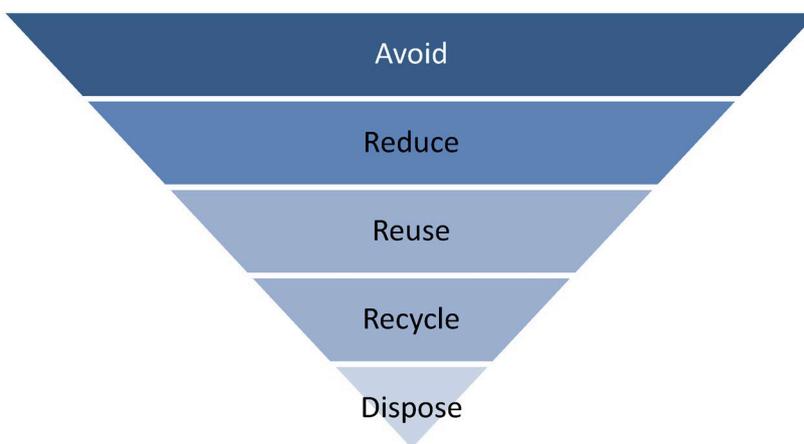


Figure 5-1 Waste Management Hierarchy

5.1.1 Reuse and recycling

Waste separation and segregation will be undertaken on-site, where practicable, to facilitate reuse and recycling. Key practices include:

- Waste segregation onsite – Waste materials, including spoil, demolition waste, concrete, asphalt, steel and other materials, will be separated onsite into dedicated bins/areas for either reuse onsite or collection by a waste contractor and transport to offsite facilities. The bins and/or stockpiles will be labelled to prevent cross contamination.
- Waste separation offsite at an appropriately licenced facility – Wastes to be deposited into one bin where space is not available for multiple bins. The waste will then be sorted offsite by a waste contractor.

Where waste cannot be reused onsite, it will be transported using an appropriately licensed waste management contractor. All transport vehicles will be covered, and tailgates secured prior to trucks leaving the work site. All vehicles will be appropriately licenced where required. The material reuse options outlined in **Table 5-1** will be implemented where reasonable and feasible.

Table 5-1 Material Reuse Options

Material Type	Reuse Options
Native Vegetation (logs, mulched timber)	Vegetation (weed free) shall be mulched and reused onsite for stabilisation in revegetated areas. The remainder will be sent to a composting facility. Re-use of mulch will occur in accordance with the Mulch Order 2016.
Concrete	Concrete components will be crushed and reused on site for access tracks, erosion controls and laydown areas. It is noted that large concrete slabs/blocks are not suitable for reuse and – subject to acceptance – would be recycled offsite at an approve facility.
Asphalt	Asphalt will be milled and re-used onsite as a base layer for access roads or transferred to a batching plant for reuse.
Spoil	Cut and fill earthworks will be balanced where possible to optimise reuse.
Aggregate	Aggregate will be reused onsite for access tracks and laydown areas.
Ballast	Ballast will be reclaimed, sampled and tested for reuse within ballast track formation or foundation improvements. Alternatively, ballast will be used for working platforms, haul roads and other temporary works requirements. Contaminated ballast that cannot be efficiently cleaned will be removed from site and disposed of at an appropriately licensed facility.
Timber formwork	Formwork will be reused multiple times onsite and stored for use on future jobs/sites if in suitable condition.

5.1.2 Waste handling and storage

Where waste is required to be handled and stored onsite prior to onsite reuse or offsite recycling/disposal, the following measures apply:

- Spoil, topsoil and mulch will be stockpiled separately onsite in allocated areas. Management controls for dust mitigation and surface water management will be implemented as per the Air Quality and Dust Management Sub-plan and the Soil and Water Management Sub-plan.
- Liquid wastes will be stored in appropriate containers in bunded areas until transported offsite. Bunded areas will have the capacity to hold 110 per cent of the liquid waste volume for bulk storage or 120 per cent of the volume of the largest container for smaller packaged storage.
- Hazardous waste will be managed by appropriately qualified and licensed contractors, in accordance with the requirements of the *Environmentally Hazardous Chemicals Act 1985* and the EPA waste disposal guidelines.
- All other recyclable or non-recyclable wastes will be stored in appropriate covered receptacles (e.g. bins or skips) in appropriate locations onsite. Contractors will be commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.

5.1.3 Waste disposal

Wastes that are unable to be reused or recycled may be exported to an EPA licensed waste facility for storage, treatment, processing, reprocessing or disposal. Disposal of waste at these facilities must include the preparation of a Material Movement Permit and Material Tracking Form, GPS tracking of waste vehicles, audits of waste facility receipts and cross verification with the facility. Details of waste types, volumes and destinations are to be recorded in the Waste Management Register (**Appendix B**). In addition, all asbestos waste over 10m³ must be tracked through EPA's WasteLocate service.

Nominated materials, waste and disposal facilities are included in the Waste Management Plan (PLR1INF-CPBD-ALL-WM-PLN-000002).

5.2 Classification of waste streams

Where waste cannot be avoided, reused or recycled, it will be classified and appropriately disposed to an appropriately licensed facility. The classification of waste is undertaken in accordance with the EPA Waste Classification Guidelines Part 1: Classifying Waste (2014). This document identifies six classes of waste: Special, Liquid, Hazardous, Restricted Solid, General Solid (putrescible) and General Solid (non-putrescible). The six-step process to classifying waste is described in the sections below.

Step 1: Is it 'special waste'?

Establish if the waste should be classified as special waste. Special wastes are: clinical and related, asbestos, waste tyres. Definitions are provided in the guidelines.

Note: Asbestos and clinical wastes must be managed in accordance with the requirements of Clauses 42 and 43 of the *Protection of the Environment Operations (Waste) Regulation 2005*.

Note: Where asbestos is mixed with other waste to form asbestos waste, the generator must continue to assess the waste in accordance with the remainder of the steps in this guide. Asbestos waste can only be disposed of at a waste facility that can lawfully receive asbestos and other class of waste with which it is mixed (if any).

If it is established that the waste is not special waste, progress to waste classification under step 2.

Step 2: If not special, is it 'liquid waste'?

If it is established that the waste is not special waste it must be decided if it is 'liquid waste'. Liquid waste means any waste that: has an angle of repose of less than 5° above horizontal becomes free-flowing at or below 60° celsius or when it is transported is generally not capable of being picked up by a spade or shovel.

Liquid wastes are sub-classified into:

- Sewer and stormwater effluent
- Trackable liquid waste according to *Protection of the Environment Operations (Waste) Regulation 2005* Schedule 1 Waste to which waste tracking requirements apply
- Non-trackable liquid waste.

If it is established that the waste is not liquid waste, progress to waste classification under step 3.

Step 3: If not liquid, has the waste already been pre-classified by the NSW EPA?

The EPA has pre-classified several commonly generated wastes in the categories of hazardous, general solid waste (putrescibles) and general solid waste (non-putrescibles). If a waste is listed as 'pre-classified', no further assessment is required.

Note: Wastes that have been classified by the EPA cannot be reclassified by any other party. A list of all the pre-classified waste streams is located in *NSW EPA Waste Classification Guidelines – Part 1: Classifying Waste (pg. 7-10)*.

If it is established that the waste is not pre-classified waste, progress to waste classification under Step 4.

Step 4: If not pre-classified, is the waste hazardous?

If the waste is not special waste (other than asbestos waste), liquid waste or pre-classified, establish if it has certain hazardous characteristics and can therefore be classified as hazardous waste.

Hazardous waste includes items such as explosives, flammable solids, substances liable to spontaneous combustion, oxidizing agents, toxic substances and corrosive substances.

Waste classified as hazardous waste cannot be disposed of in NSW and must be treated prior to disposal. Suitable waste treatment facilities are detailed in the Waste Management Plan (PLR11NF-CPBD-ALL-WM-PLN-000002).

If it is established that the waste is not hazardous waste, progress to waste classification under Step 5.

Step 5: If the waste does not have hazardous characteristics, undertake chemical assessment to determine classification

If the waste does not possess hazardous characteristics, it needs to be chemically assessed to determine whether it is hazardous, restricted solid or general solid waste (putrescible and non-putrescible). If the waste is not chemically assessed, it must be treated as hazardous.

Waste is assessed by comparing Specific Contaminant Concentrations (SCC) of each chemical contaminant, and where required the leachable concentration using the Toxicity Characteristics Leaching Procedure (TCLP), against Contaminant Thresholds (CT).

If it is established that the waste is not hazardous or restricted waste, it is then general solid waste. Progress to waste classification under step 6 and determine whether the general solid waste is putrescible or non-putrescible.

Step 6: Is the general solid waste putrescible or non-putrescible?

If the waste is chemically assessed as general solid waste, a further assessment is available to determine whether the waste is putrescible or non-putrescible. The assessment determines whether the waste is capable of significant biological transformation. If this assessment is not undertaken, the waste must be managed as general solid waste (putrescible).

5.3 Classification of potential waste streams

The types of wastes which may be generated during construction are detailed in **Table 5-2** together with waste classifications.

Table 5-2 Classification of potential waste streams

Construction Activity	Waste Type	Waste Classification	Approx. quantity	Proposed reuse/recycling/disposal methods	Reuse / Recycle Target
Earthworks/ excavation	Vegetation (weed free): trees, grass	General Solid Waste Non-Putrescible (pre-classified)	850m ³	Where possible and fit for purpose, green waste will be mulched and beneficially reused within the alignment before off-site reuse or disposal options are pursued.	100% reuse/ recycle
	Vegetation (containing weeds or contaminated): trees, grass	General Solid Waste Non-Putrescible (pre-classified)	850m ³	Removal and disposal in accordance with the <i>Protection of the Environment Operations (Waste) Regulations 2014</i> and <i>Waste Classification Guidelines (OEH 2009)</i> .	N/A
	Topsoil	General Solid Waste Non-Putrescible (pre-classified)	18,700T	Topsoil will be stored in designated stockpiles within the alignment where the material can be regularly aerated.	95% topsoil remains productive at completion
	Spoil (ENM or VENM)	General Solid Waste Non-Putrescible (pre-classified)	156,000T	Subject to analytical waste classification, spoil will be beneficially reused within the alignment before off-site reuse or disposal options are pursued.	100% of useable spoil
	Contaminated spoil	Chemical Assessment/ Hazardous Waste	64,000T	Removal and disposal in accordance with the <i>Protection of the Environment Operations (Waste) Regulations 2014</i> and <i>Waste Classification Guidelines (OEH 2009)</i> .	N/A
	Rock fragments	General Solid Waste (non-putrescible)	1,350m ³	Rock fragments will be stored in designated stockpiles onsite or appropriate receptacles (e.g. bins or skips). Material that is excess or not suitable for reuse will be collected regularly by subcontractors and transferred to approved recycling/disposal facilities.	95% of uncontaminated construction/ demolition waste

Construction Activity	Waste Type	Waste Classification	Approx. quantity	Proposed reuse/recycling/disposal methods	Reuse / Recycle Target
Demolition/ Construction	Concrete	General Solid Waste (non-putrescible)	16,200T	Concrete will be stored in designated stockpiles onsite or appropriate receptacles (e.g. bins or skips). Material that is excess or not suitable for reuse will be collected regularly by subcontractors and transferred to approved recycling/disposal facilities.	95% of uncontaminated construction/ demolition waste
Demolition/ Construction	Asphalt	General Solid Waste(non-putrescible)	15,600T	Asphalt will be stored in designated stockpiles onsite or appropriate receptacles (e.g. bins or skips). Material that is excess or not suitable for reuse will be collected regularly by subcontractors and transferred to approved recycling/disposal facilities.	95% of uncontaminated construction/ demolition waste
	Bricks	General Solid Waste (non-putrescible)	2,000m ³	Bricks will be stored in designated stockpiles onsite or appropriate receptacles (e.g. bins or skips). Material that is excess or not suitable for reuse will be collected regularly by subcontractors and transferred to approved recycling/disposal facilities.	95% of uncontaminated construction/ demolition waste
	Steel	General Solid Waste (non-putrescible) (excluding rail)	400T	Steel will be stored in appropriate receptacles (e.g. bins or skips) and reused for other purposes during construction if feasible to do so. Excess steel will be collected regularly by subcontractors and transferred to approved recycling/disposal facilities.	95% of uncontaminated construction/ demolition waste
	Timber/Wood	General Solid Waste (non-putrescible) (excluding rail sleepers)	350T	Timber/wood will be stored in appropriate receptacles (e.g. bins or skips) and reused for other purposes during construction if feasible to do so. Excess or contaminated materials (e.g. rail sleepers) will be collected regularly by subcontractors and transferred to approved recycling/disposal facilities.	95% of uncontaminated construction/ demolition waste

Construction Activity	Waste Type	Waste Classification	Approx. quantity	Proposed reuse/recycling/disposal methods	Reuse / Recycle Target
	General Mixed Construction Waste	General Solid Waste (non-putrescible)	4,000T	Construction waste will be separated as far as reasonably practicable to minimise general mixed construction waste. Material will be stored in appropriate receptacles (e.g. bins or skips) and collected regularly by subcontractors and transferred to approved recycling/disposal facilities.	95% of uncontaminated construction/ demolition waste
Demolition/ Construction	Asbestos Containing Material	Special Waste	3,500T	Asbestos containing material will be managed by appropriately qualified and licensed contractors, in accordance with the requirements of the <i>Work Health and Safety Regulation 2011</i> and the <i>Protection of the Environment Operations (Waste) Regulations 2014</i> .	N/A
	Ballast	Waste classification subject to chemical assessment	10,800T	Ballast will be reused for other purposes during construction if feasible to do so. Hazardous waste will be managed by appropriately qualified and licensed contractors, in accordance with the requirements of the <i>Environmentally Hazardous Chemicals Act 1985</i> and the EPA waste disposal guidelines.	100% reuse/ recycle where permitted by waste classification
	Redundant conduits, pipes and cables	General Solid Waste (non-putrescible)	500T	All recyclable or non-recyclable wastes will be stored onsite in appropriate covered receptacles (e.g. bins or skips). Contractors will be commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.	95% of uncontaminated construction/ demolition waste

Construction Activity	Waste Type	Waste Classification	Approx. quantity	Proposed reuse/recycling/disposal methods	Reuse / Recycle Target
	Soil and water from Non-Destructive Digging	Liquid Waste	5,000T	Solid and liquid material collected through NDD would be separated. Subject to chemical assessment, materials would be reused onsite.	100% reuse/ recycle where permitted by waste classification
Wash-down and maintenance of equipment	Oils	Liquid Waste	5,000L	All waste oils will be stored in appropriate covered receptacles (e.g. drums) in bunded sheds or pallets. A licenced contractor will be commissioned to regularly remove/empty the receptacles to approved disposal or recycling facilities.	100% of uncontaminated oil
	Used chemicals	Chemical Assessment Required	2,000L	All used chemicals will be stored in appropriate covered receptacles (e.g. drums) in bunded sheds or pallets. A licenced contractor will be commissioned to regularly remove/empty the receptacles to approved disposal or recycling facilities.	N/A
Dust suppression	Wastewater	Liquid Waste – Chemical Assessment may be required	5,000KL	Collected wastewater that cannot be reused on site (e.g. for dust suppression) would be removed by a licensed contractor and taken to an appropriately licensed liquid waste facility for treatment or disposal.	50% non-potable water use for Contractor's activities
Office activities	Food scraps	General Solid Waste (putrescible)	50T	All non-recyclable wastes will be stored in covered receptacles (e.g. bins or skips) in appropriate locations onsite. Contractors will be commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.	50% of uncontaminated office waste

Construction Activity	Waste Type	Waste Classification	Approx. quantity	Proposed reuse/recycling/disposal methods	Reuse / Recycle Target
	Paper/Cardboard	General Solid Waste (non-putrescible)	50T	All recyclable wastes will be stored in covered receptacles (e.g. bins or skips) in appropriate locations onsite. Contractors will be commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.	100% of uncontaminated office waste
	Plastic	General Solid Waste (non-putrescible)	50T		100% of uncontaminated office waste
	Glass	General Solid Waste (non-putrescible)	20T		100% of uncontaminated office waste
Sewage	Sewage	Liquid Waste – Chemical Assessment may be required	75T	Sewage from temporary site amenities will be removed by a licensed contractor and taken to an appropriately licensed liquid waste facility for treatment or disposal.	N/A

5.4 Waste exemption

Clause 51 Protection of the Environment Operations (Waste) Regulation 2005 enables the EPA to grant exemptions to the licensing and payment of levies for the land application or use of waste. The EPA has issued general exemptions for a range of commonly recovered, high volume and well characterised waste materials that allow their use as fill or fertiliser at unlicensed, off-site facilities.

The general Resource Recovery Exemptions and Orders that may be applicable to the Infrastructure Works are defined in **Table 5-3** below. These are general gazette exemptions that do not require approval. Other general Resource Recovery Exemptions and Orders may be utilised during construction where consistent with achieving the project's waste targets.

A specific exemption may be granted where an application is made to the EPA.

Table 5-3 Waste Recovery Exemptions and Orders, and associated conditions

Exemption/Order	General Conditions
<p>The excavated natural material exemption 2014</p> <p>The excavated natural material order 2014</p>	<p>At the time the excavated natural material is received at the premises, the material must meet all chemical and other material requirements as detailed in the 'the excavated natural material order 2014'. This includes a written sampling plan, characterisation sampling, and analytical testing in accordance with defined test methods.</p> <p>The excavated natural material can only be applied to land as engineering fill or for use in earthworks.</p> <p>The consumer must keep a written record of the following for a period of six years:</p> <ul style="list-style-type: none"> a) the quantity of any excavated natural material received; and b) the name and address of the supplier of the excavated natural material received. <p>The consumer must provide any records required to be kept under this exemption available to authorised officers of the EPA on request.</p> <p>The consumer must ensure that any application of excavated natural material to land must occur within a reasonable period of time after its receipt.</p>
<p>The excavated public road material exemption 2014</p> <p>The excavated public road material order 2014</p>	<p>The excavated public road material can only be applied to land within the road corridor for public road related activities including road construction, maintenance and installation of road infrastructure facilities.</p> <p>The excavated public road material can only be stored within the road corridor at the site where it is to be applied to land.</p> <p>The excavated public road material cannot be applied to private land.</p> <p>The consumer must ensure that any application of excavated public road material to land must occur within a reasonable period of time after its receipt.</p> <p>Records must be retained for a period of six years.</p>

Exemption/Order	General Conditions
<p>The mulch exemption 2016</p> <p>The mulch order 2016</p>	<p>The raw mulch can only be applied to land for the purposes of filtration or as a soil amendment material or used either singularly or in any combination as input material(s) to a composting process.</p> <p>At the time mulch is received at the premises, the material must meet all requirements as detailed in the 'the mulch order 2016'.</p> <p>Where written measures for the land application of mulch are required under 'the mulch order 2016', a processor must provide these to the consumer. The consumer must apply the mulch to land in accordance with the written measures.</p> <p>The consumer must ensure that they do not cause or permit the migration of leachate from the land application site.</p> <p>The consumer must not undertake further processing of the mulch at the land application site.</p> <p>The consumer must ensure that any application of mulch to land occurs within a reasonable period of time after its receipt.</p>
<p>The recovered aggregate exemption 2014</p> <p>The recovered aggregate order 2014</p>	<p>The material must meet all chemical concentration and other material requirements for recovered aggregate under "the recovered aggregate order 2014". This includes a written sampling plan, characterisation sampling, and analytical testing in accordance with defined test methods.</p> <p>The recovered aggregate can only be applied to land for road making activities, building, landscaping and construction works. This approval does not apply to any of the following applications:</p> <ul style="list-style-type: none"> • Construction of dams or related water storage infrastructure • Mine site rehabilitation • Quarry rehabilitation • Sand dredge pond rehabilitation • Back-filling of quarry voids • Raising or reshaping of land used for agricultural purposes • Construction of roads on private land unless: the relevant waste is applied to land to the minimum extent necessary for the construction of a road, and a development consent for the development has been granted under the relevant Environmental Planning Instrument (EPI), or it is to provide access (temporary or permanent) to a development approved by a Council, or the works undertaken are either exempt or complying development.

Exemption/Order	General Conditions
<p>The reclaimed asphalt pavement exemption 2014</p> <p>The reclaimed asphalt pavement order 2014</p>	<p>The reclaimed asphalt pavement can only be:</p> <ul style="list-style-type: none"> • applied to land for road related activities including road construction or road maintenance activities being: <ul style="list-style-type: none"> a) use as a road base and sub base b) applied as a surface layer on road shoulders and unsealed roads and c) use as an engineering fill material. • used as an alternative input into thermal processes for non-energy recovery purposes in the manufacture of asphalt. <p>The consumer must ensure that any application of reclaimed asphalt pavement to land or any use of reclaimed asphalt pavement in connection with a process of thermal treatment must occur within a reasonable period of time after its receipt.</p>

6 Resource management and conservation

The JV Team is dedicated to implementing resource conservation best practice and the reduction of greenhouse gases through energy efficient work practices. Initial resource conservation opportunities that are being explored by the JV are detailed in **Table 6-1**.

The project has committed to a minimum 20% reduction and aspirational 25% reduction in project Lifecycle greenhouse gas emissions when measured against the projects base case (DPSMP Section 4.3). This incorporates the embodied carbon within resources and those released during material disposal (end of life).

Opportunities to reduce consumption will be explored during design review and value engineering workshops. Opportunities that indicate resource reduction (materials, water, waste and energy) will be logged, tracked and managed through the Sustainability Opportunities Register (DPSMP Appendix B). The Sustainability Opportunity Register is a stand-alone register which will remain live until project completion is achieved.

Revised quantities from the design will be incorporated into the Projects Carbon Inventory Report (Life Cycle Assessment) and reported in the Sustainability in Design Works Report Package at each stage of design phase (SDR, PDR, DDR and AFC). The JV will use the Energy and Carbon Inventory to demonstrate scale and key areas of resource impacts across the infrastructure lifecycle. The inventory will highlight the inputs with the highest carbon risk (impact) and guide areas of opportunity that the JV should focus resources on to influence carbon reduction over the infrastructure lifecycle.

Consumption quantities of water, energy, carbon and materials will also be monitored throughout construction to update the Life Cycle Assessment. The process for the development of the Life Cycle Assessment is outlined in the DPSMP.

Table 6-1 Resource Conservation Opportunities

Resource	Predicted Consumption	Resource Conservation Opportunities
Potable water	25,000 KL (Actual at Sept 2021 is 52,543KL)	<ul style="list-style-type: none"> • Use of non-potable alternatives (e.g. collected rainwater, waste water) • Use of non-potable water for concrete batching plants • Use of non-potable water for landscaping solutions • Minimise the use of water filled barriers where feasible • Use of waterless urinals • Use of water efficient taps and fittings • Use of non-potable water for non-destructive digging • Use of Jemena’s Recycled Water facility at Camellia.

Resource	Predicted Consumption	Resource Conservation Opportunities
Electricity	2,700,000 kW (Actual at Sept 2021 is 1,023,371 kW))	<ul style="list-style-type: none"> • Uptake of energy efficient construction practices • Installation of Sustainable Site Sheds and fit out of existing buildings • Use of energy efficient fittings and fixtures (where feasible) • Use of energy efficient or solar powered lighting for temporary construction facilities • Optimising the alignment of grade and radius' • Purchase of GreenPower.
Fuel	14,300,000 L (Actual at Sept 2021 is 2,163,790 L)	<ul style="list-style-type: none"> • Use of biodiesel and other low carbon fuels in vehicles and equipment • Use of fuel efficient/hybrid construction equipment • Promote efficient operator behaviour; switch off construction plant, vehicles and equipment when not in use to minimise idling • Use of mains connections for site facilities (where feasible) • Optimise haulage distances and material handling practices • Develop and implement a Green Travel Plan.
Cement	4,200 M ³ (Actual at Sept 2021 is 41,402m ³)	<ul style="list-style-type: none"> • Procure a minimum of 25% substitution of fly ash or 50% blast furnace slag in line with AS5100.5 (where feasible) • Procure lower carbon intensive manufactured concrete
Steel	20,000 T (Actual at Sept 2021 is 6,741 T)	<ul style="list-style-type: none"> • Procure Macro Synthetic Fibre non-steel reinforcement within embedded track (subject to ASA approval and stray current collection requirements) • Procure a minimum of 60% of reinforcing steel that has been manufactured using energy reducing processes • Procure a minimum of 60% of fabricated structural steelwork supplied by a steel fabricator/steel contractor accredited to the ASI Environmental Sustainability Charter (ESC).
Asphalt	25,000 T (Actual at Sept 21 is 8,712 T)	<ul style="list-style-type: none"> • Use of reclaimed asphalt pavement (RAP) material in new asphalt pavement and sub-base • Use of TonerPave (low CO₂ asphalt) (where feasible) • Use of PlastiPave (asphalt product utilising waste soft plastics) (where feasible).

Resource	Predicted Consumption	Resource Conservation Opportunities
Timber	50 T (Actual at Sept 21 is 429 T)	<ul style="list-style-type: none"> • Use reusable formwork, where practicable • Procure a minimum of 95% (by cost) of timber products that are either re-used timber, postconsumer recycled timber or Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification (PEFC) certified timber.
Aggregates	305,000 T (Actual at Sept 21 is 240,607 T)	<ul style="list-style-type: none"> • Use of recycled and recyclable materials where possible • Reuse of suitable site won material.

7 Environmental control measures

Specific measures and requirements to meet the objectives of this WRMP and to address contract specifications, CoA and REMMMs are outlined in **Table 7-1**.

Table 7-1 Waste, energy, and water management and mitigation measures

ID	Measure/Requirement	How Implemented	When to implement	Responsibility	Reference
WM01	All site personnel will attend a project induction in waste and resource management, including reuse/recycling targets and the principles of the waste hierarchy.	Project training (induction, toolbox or specific training)	Construction	Environment and Sustainability Manager	Best practice REMMM WM-2
WM02	Reflecting the waste hierarchy, waste management principles and targets will be incorporated into site specific management plans and procedures.	Environmental Control Map	Pre-construction Construction	Environment and Sustainability Manager	Best practice REMMM WM-2
WM03	Prefabricated materials will be used where possible.	Environmental Design Review Report	Pre-construction Construction	Project Engineer	Best practice
WM04	Procure materials on an 'as needed' basis to reduce over-ordering and wastage.	Project training (induction, toolbox or specific training)	Construction	Project Engineer	REMMM WM-2
WM05	Recycled materials from the demolition phase will be reused to the maximum permitted extent (e.g. asphalt and concrete). The remainder will be transferred to a recycling facility.	Environmental Work Method Statements	Construction	Environment and Sustainability Manager	CoA E127 REMMM WM-2
WM06	Concrete components will be crushed and reused on site, where possible. Excess material will be transferred to a recycling facility.	Environmental Work Method Statements	Construction	Environment and Sustainability Manager	Best practice REMMM WM-2

ID	Measure/Requirement	How Implemented	When to implement	Responsibility	Reference
WM07	Cover unconsolidated stockpiles with geofabric, hydro mulch or other revegetation applicants where stockpiles are to be left standing for extended periods.	Environmental Inspection Checklist	Construction	Environment and Sustainability Manager	Best practice
WM08	Asbestos or asbestos-contaminated materials that are discovered during demolition and construction activities will be strictly managed in accordance in accordance with the requirements of the <i>Work Health and Safety Regulation 2011</i> , the <i>Protection of the Environment Operations (Waste) Regulations 2014</i> and the Asbestos and Air Quality Management Plan. All asbestos waste over 10m ³ must be tracked through EPA's WasteLocate service.	Safe Work Method Statements	Construction	Site Supervisor	CoA E131 CoA E129 REMMM WM-5
WM09	Recycling receptacles will be inspected frequently to monitor contamination levels that would restrict recycling potential.	Environmental Inspection Checklist	Construction	Environment and Sustainability Manager Site Supervisor	Best practice REMMM WM-2
WM10	Liquid wastes (e.g. waste oil) will be stored in appropriate containers in bunded areas (with 110% capacity of the largest container) and disposed at an appropriately licensed facility.	Environmental Inspection Checklist	Pre-construction Construction	Environment and Sustainability Manager Site Supervisor	Best practice
WM11	Waste truck loads will be covered prior to trucks leaving the worksite.	Environmental Inspection Checklist	Construction	Site Supervisor	Best practice

ID	Measure/Requirement	How Implemented	When to implement	Responsibility	Reference
WM12	Spill kits will be maintained and located near high risk areas on site including waste oil storage areas and plant refuelling sites.	Environmental Control Map Environmental Inspection Checklist	Pre-construction Construction	Environment and Sustainability Manager Site Supervisor	Best practice
WM13	Excavated materials and contamination (including VENM and ENM) will be classified, handled, stored and reused or removed from site in accordance with the requirements of this Sub-plan and the Waste Classification Guidelines.	Project training (induction, toolbox or specific training) Environmental Control Map	Construction	Environment and Sustainability Manager	CoA E127 REMMM WM-2
WM14	Materials will be segregated into stockpiles of spoil, concrete, steel, timber, paper and cardboard and vegetation to maximise recycling opportunities and sent to a waste facility with recycling capabilities.	Project training (induction, toolbox or specific training) Environmental Control Map	Construction	Environment and Sustainability Manager	CoA E127 REMMM WM-2 REMMM WM-4
WM15	Labelled storage containers (bins, skips, tanks, etc) will be provided at each work area, where possible, and in sufficient numbers to facilitate segregation of waste.	Environmental Control Map Environmental Inspection Checklist	Construction	Environment and Sustainability Manager Site Supervisor	CPB Contractors Mandatory Minimum REMMM WM-4
WM16	Waste and recycling containers must be emptied at a frequency that is sufficient to ensure their correct use. If a bin needs to be collected contact your supervisor or Environmental Coordinator.	Environmental Control Map	Construction	Site Supervisor	CPB Contractors Mandatory Minimum

ID	Measure/Requirement	How Implemented	When to implement	Responsibility	Reference
WM17	Ensure waste and contaminated material is transported by a licensed contractor (as required) and received at an appropriately licensed site for storage, treatment, processing, reprocessing or disposal (Appendix B). All appropriate documents and disposal dockets will be retained for audit purposes (refer to Section 8).	Project training (induction, toolbox or specific training) Waste audits	Construction	Environment and Sustainability Manager	CoA E129 CoA E130 REMMM WM-2
WM18	The relevant licences of waste facilities utilised for the disposal or handling of waste will be obtained to ensure they are legally compliant.	Principle risk assessment	Pre-construction	Environment and Sustainability Manager	CPB Contractors Mandatory Minimum
WM19	All waste disposal vehicles must be equipped with an operating GPS tracker.	Contract specifications Waste audits	Construction	Environment and Sustainability Manager	CoA E129
WM20	Conduct annual audits of waste facility receipts and cross verification with the facility.	Waste audits	Construction	Environment and Sustainability Manager	CoA E129 REMMM WM-2
WM21	Excess concrete and concrete washout will not be discharged to land or stormwater; a bunded and lined concrete washout facility must be used.	Project training (induction, toolbox or specific training) Environmental Inspection Checklist	Construction	Site Supervisor	CPB Contractors Mandatory Minimum

ID	Measure/Requirement	How Implemented	When to implement	Responsibility	Reference
WM22	Onsite and offsite concrete batching plants will use non-potable water where available.	Project training (induction, toolbox or specific training) Audits Environmental Inspection Checklist Procurement Management Plan	Construction	Site Supervisor	Best practice
WM23	An adequate number of fully maintained concrete washout pits will be maintained on-site at all times.	Project training (induction, toolbox or specific training) Environmental Inspection Checklist	Construction	Site Supervisor	CPB Contractors Mandatory Minimum
WM24	Burial or burning of waste is not permitted.	Project training (induction, toolbox or specific training) Environmental Inspection Checklist	Construction	Site Supervisor / Project Engineer	CPB Contractors Mandatory Minimum
WM25	The on-site management of spoil, beneficial reuse and disposal of spoil will comply with the Spoil Management Strategy (Appendix A).	Environmental Control Map Environmental Inspection Checklist Spoil Management Strategy	Construction	Environment and Sustainability Manager	CoA E127 REMMM WM-6

ID	Measure/Requirement	How Implemented	When to implement	Responsibility	Reference
WM26	Fuel and oil storage for machinery and plant will be secured and stored within bunded areas/containers on compound sites during works and removed on completion of works.	Environmental Control Map Environmental Inspection Checklist	Construction	Environment and Sustainability Manager	Best practice
WM27	All waste data will be collated and tracked using the Waste Register (Appendix B).	Waste Audits	Construction	Environment and Sustainability Manager	CBP Contractors Mandatory Minimum
WM28	The site will be maintained in a clean and tidy condition and rubbish will be regularly removed from site.	Environmental Inspection Checklist	Construction	Site Supervisor	Best practice
WM29	Pre-classified contaminated materials will be transferred directly into haulage trucks for off-site disposal at a waste facility licensed to accept the contaminated material.	Waste Audits	Construction	Environment and Sustainability Manager or other independent party as required by the IS Technical Manual v1.2 and the CEMP audit requirements.	CoA E127 REMMM HY-6
WM30	Investigate and where feasible implement the resource conservation opportunities detailed in Table 6-1 of this Sub-plan.	Environmental Design Review Report	Pre-construction	Environment and Sustainability Manager	Best practice.

ID	Measure/Requirement	How Implemented	When to implement	Responsibility	Reference
WM31	Where possible and fit for purpose, green waste will be mulched and beneficially reused within the alignment before off-site reuse or disposal options are pursued. Green waste containing weeds or contaminated material must be classified and disposed to an appropriately licensed facility.	Environmental Control Map	Construction	Site Supervisor	Best practice
WM32	Ensure that any waste generated outside of the premises is not received at the premises except VENM, or as expressly permitted by a resource recovery exemption under the POEO Act.	Material Movement Permit	Construction	Site Supervisor	EPL 21347 (O4.4)
WM33	Where waste is received at the premises or transported offsite in accordance with a Resource Recovery Order and/or Exemption, ensure that all document/record keeping requirements (as required by the respective order/exemption) are retained.	Material Movement Permit	Construction	Site Supervisor	EPL 21347 (O4.5)
WM34	Ensure that all documents/records are retained which evidence that all waste transported from the premises was taken to a facility/premises that lawfully accept that waste type (refer to Waste Management Plan).	Material Movement Permit Materials Tracking Form	Construction	Site Supervisor	EPL 21347 (O4.6)

ID	Measure/Requirement	How Implemented	When to implement	Responsibility	Reference
WM35	Excavated material suitable for re-use within the premises may be transported from one part of the premises to another part of the premises by road in accordance with this Sub-plan, including Appendix A (Spoil Management Strategy)	Materials Characterisation Form Materials Tracking Form	Construction	Site Supervisor	EPL 21347 (O4.7)

8 Compliance management

8.1 Roles and responsibilities

The JV Team's organisational structure and overall roles and responsibilities are outlined in Section 3.2 of the CEMP. Specific responsibilities for the implementation of environmental controls related to waste management and resource use are detailed in Section 7 of this Sub-plan.

8.2 Training

All employees and subcontractors working on-site will undergo site induction training relating to waste and resource management issues. The induction training will address elements related to waste and resource management including:

- Existence and requirements of this Sub-plan
- Relevant compliance obligations
- Incident response, management and reporting
- Waste reporting, tracking and monitoring requirements
- Efficient use of plant and materials
- Documentation and record keeping requirements
- Waste/material storage, segregation and transportation requirements
- Potential for contaminated material (including asbestos containing material) to be present on site and management requirements
- Appropriate location, use and maintenance of spill kits near high risk areas on site including waste oil storage areas and plant refuelling sites.

Targeted training in the form of toolbox talks, daily pre-starts or specific training will also be provided to personnel with a key role in waste and resource management.

Further details regarding staff induction and training are outlined in Section 3.4 of the CEMP.

8.3 Monitoring and inspection

Monitoring and inspection requirements relevant to the management of waste and resources are identified in **Table 8-1**.

8.4 Reporting

Reporting requirements relevant to the management of waste and resources are identified in **Table 8-2**.

A Waste/Material Tracking Register (**Appendix B**) will be maintained by the Environment and Sustainability Manager to record the management of waste from the Infrastructure Works. The waste register will be populated with the waste transfer forms and include the following details:

- Date/time
- Waste classification
- Description of waste

- Volume or weight
- Transporter name and waste licence number
- Receiving facility name, address and EPA licence
- Description of waste use (reused, recycled, stockpiled or disposed of)
- Location of reuse (if reused onsite)
- Invoice number/ receiving facility ref number.

8.5 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this Sub-plan, CoA and other relevant approvals, licenses and guidelines. As detailed in Section 3.8.4 of the CEMP, the audit program includes the following audit categories.

- **Compliance** – Compliance audits will focus on contractual obligations as defined in the Infrastructure Works Contract. In addition, waste audits will be undertaken to assess completeness of waste facility receipts.
- **System** – System audits will assess compliance with the documented EMS including the WRMP. Audits will review the design and implementation of critical controls.
- **Sub-contractor** – Sub-contractor audits will assess compliance against environmental and sustainability specifications, including waste and resource requirements.

Table 8-1 Inspection and Monitoring Requirements

Item	Scope	Timing	Frequency	Responsibility	Records / Reporting
Environmental site inspections	Environmental site inspections to check: <ul style="list-style-type: none"> • Stockpile management • Waste bin labels, capacity and cross contamination • Waste storage • Covering of loads • Concrete washout • Housekeeping 	Construction	Weekly	Environmental Coordinator(s)	Environmental inspection checklist
Spoil Tracking	Reconciliation of mass haul Total volume %'s contaminated/uncontaminated %'s reused onsite/reused offsite/disposed to landfill	Construction	Monthly	Sustainability Coordinator / Environmental Coordinator(s)	Monthly Progress Reports Annual Sustainability Report GPS Tracking Materials Tracking Form
Topsoil	Total topsoil won %'s topsoil contaminated / uncontaminated % topsoil remaining productive at completion of construction.	Construction	Monthly	Sustainability Coordinator / Environmental Coordinator(s)	Topsoil and Stockpile Inspection Form Monthly Progress Reports Annual Sustainability Report

Item	Scope	Timing	Frequency	Responsibility	Records / Reporting
Construction and Demolition Waste Tracking	Construction and Demolition Waste (excluding spoil) reused/recycled	Pre-construction early works and Construction	Monthly	Sustainability Coordinator / Environmental Coordinator(s)	Monthly Progress Reports Annual Sustainability Report
Waste to Destination monitoring	Audit of the waste disposal of significant waste streams (spoil, asphalt, construction and demolition waste). (Refer to ICSA Was-2)	Construction	Bi-annually	Sustainability Coordinator	Waste to destination audit reports Material Movement Permit Materials Tracking Form
Office Waste Tracking	Percentage of office waste reused / recycled	Design and Construction	Monthly	Sustainability Coordinator	Monthly Progress Reports Annual Sustainability Report
Office Waste Inspection	Reduction in office waste Percentage of incorrect waste disposal	Construction	Monthly	Sustainability Coordinator	Annual Sustainability Report
Water consumption monitoring	Reduction in water usage Percentage of potable vs non-potable water	From project award to completion	Monthly Annual Reconciliation	Sustainability Coordinator	Monthly Progress Reports Annual Sustainability Report

Item	Scope	Timing	Frequency	Responsibility	Records / Reporting
Energy and Greenhouse Gas emissions	Collection and collation of <ul style="list-style-type: none"> • Electricity consumption • Fuels / Lubricants/ Solvents • Other greenhouse gas emissions. 	From project award to completion	Monthly Annual Reconciliation	Commercial Manager Sustainability Coordinator	JDE Subcontractor Fuel Reporting Form Monthly Progress Reports Annual Sustainability Report NGER Reporting
Renewable energy usage	Total electricity used AND purchase of Australian Carbon Offset Credits (defined as eligible offsets under the National Carbon Offset Standard); OR purchase of renewable energy from an Accredited Renewable Energy Supplier	From contract award to demobilisation	Monthly Reconciled annually	Sustainability Coordinator	Monthly Progress Reports Annual Sustainability Report

Item	Scope	Timing	Frequency	Responsibility	Records / Reporting
Material Consumption	Concrete – total and Percentage of Supplementary Cementitious Material (SCM) Steel – total and % recycled content Asphalt – total and % recycled content Aggregates– total and % recycled content Other significant materials identified through ISCA Base Case	Construction	Monthly Reconciled annually	Sustainability Coordinator	Monthly Progress Reports Annual Sustainability Report
Green Travel	Monitoring of Green travel in accordance with the Green Travel Plan	Construction	Annually	Sustainability Coordinator	Green Travel Plan Report
Odour Monitoring	Monitoring of odour at spoil retention sites in accordance with the Materials Tracking and Environmental Management Plan (Appendix A).	Construction	Hourly during periods of receipt or handling of potentially malodourous materials and twice daily during other periods.	Environmental Coordinator(s)	Odour Monitoring Form (Contaminated Land Management Sub-plan)

Table 8-2 Reporting Requirements

Report	Scope	Timing	Frequency	Responsibility	Submission
Monthly Progress Reports	<p>Progress against the requirements of the Sub-plan including:</p> <ul style="list-style-type: none"> • Spoil Tracking • Topsoil preservation • Construction and Demolition Waste Tracking • Office Waste Tracking • Water consumption • Energy and Greenhouse Gas emissions • Renewable energy usage • Material Consumption. 	Monthly, within seven Business Day after the end of the relevant calendar month.	Monthly	Environment and Sustainability Manager with input from Sustainability Coordinator	TfNSW
NGER Reporting	Report energy and greenhouse gas emissions	End of financial year	Annually	Commercial Manager	CPB Corporate to report to the Australian Government

Report	Scope	Timing	Frequency	Responsibility	Submission
Annual Sustainability Report	Annual reconciliation: <ul style="list-style-type: none"> • Spoil Tracking • Topsoil preservation • Construction and Demolition Waste Tracking • Office Waste Tracking • Water consumption • Energy and Greenhouse Gas emissions • Renewable energy usage • Material Consumption. 	31 August	Annually	Sustainability Coordinator	TfNSW IC
Green Travel Plan Report	Update on achievements of the Green Travel Plan	31 August (attached to annual Sustainability Report)	Annually	Sustainability Coordinator	TfNSW IC
ISCA Materials Calculator or Life Cycle Assessment	Development of: <ul style="list-style-type: none"> Base Case Design Phase As-Built phase 	ISCA Design and As-built Submissions		Sustainability Coordinator	Internal ISCA
Waste to destination audit reports	Report of observations and recommendations waste disposal of significant waste streams (spoil, asphalt, construction and demolition waste). (Refer to ICSA Was-2)	Within 10 days of audit	Six monthly	Sustainability Coordinator	Internal ISCA

9 Review and improvement

9.1 Continuous improvement

Continuous improvement of this Sub-plan will be achieved through the ongoing evaluation of performance against environmental policies, objectives and targets. Specific actions to be undertaken include:

- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement.

9.2 WRMP update and amendment

The processes described in Section 3.8 to Section 3.12 of the CEMP may result in the need to update or revise this Sub-plan. This will occur as needed.

Only the Environment and Sustainability Manager, or delegate, has the authority to change any of the environmental management documentation.

A copy of the updated Sub-plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 3.10.2 of the CEMP.

Appendix A – Spoil Management Strategy

A.1 Purpose

The purpose of this Spoil Management Strategy (SMS) is to:

- Identify appropriate spoil storage and disposal sites
- Minimise spoil removal and associated impacts on stakeholders, community and the environment
- Maximise the beneficial reuse of spoil material
- Manage spoil on-site and transport of spoil off-site.

This SMS forms part of the Construction Environmental Management Plan (CEMP) for the Parramatta Light Rail Stage 1 – Infrastructure Works.

A.2 Scope

This SMS applies to the generation, storage, transport, reuse and disposal of spoil from the Infrastructure Works.

A.3 On-site Management and Storage

Spoil will be managed in accordance with the following hierarchy:

1. Avoidance of spoil generation through design and management
2. Reuse of spoil within the alignment (targeting 100% reuse of useable spoil)
3. Beneficial reuse of spoil outside the alignment for site levelling, development or rehabilitation
4. Disposal of spoil outside the alignment for a non-beneficial uses (landfilling).

In addition to the requirements of the WRMP, the following controls will apply to the management and storage of spoil:

- Topsoil reuse will be maximised on site to minimise the import of external topsoil for revegetation and landscaping purposes wherever practicable
- The amount of spoil being generated will be reduced through the design and construction methodology to achieve a reuse/recycling target of 100% (usable spoil)
- Excess spoil (VENM and ENM) will be transported to a secure site and stored separately to prevent cross contamination. Spoil will be sampled, analysed and characterised according to the Waste Classification Guidelines: Part 1 Classifying Waste (NSW EPA, 2014).

A.4 Off-site Transport and Disposal

Any spoil that cannot be reused due to contamination must be collected by a licensed waste contractor and exported to a site licensed by the EPA for the storage, treatment, processing, reprocessing or disposal of the subject waste, or in accordance with a valid Resource Recovery Exemption or Order. Approved spoil disposal locations are detailed in Table A-1. Alternative disposal locations may be utilised subject to approval of the Environment and Sustainability Manager.

Prior to off-site disposal, a Material Movement Permit must be prepared by the Site Engineer and Environmental Coordinator (Appendix C). Each load of material must be recorded on a Material Tracking Form which is cross-referenced to the appropriate Material Movement Permit. All Material Movement Permits must be recorded in a Waste Management Register (Appendix B) and reconciled against disposal dockets.

All disposal vehicles must be equipped with GPS tracking. In addition, all construction spoil haulage vehicles and construction plant must be clearly marked as being for the CSSI in such a manner to enable immediate identification within at least 50 metres of the vehicles and plant.

Table A-1 Spoil Disposal Locations

Facility Name	Lawfully Received Spoil Types	EPL
Brandown Pty Ltd Lot 90 Elizabeth Drive, Kemps Creek 2171	<ul style="list-style-type: none"> • General solid waste (non-putrescible) excluding biosolids • Excavated Natural Material (soils) • VENM • Soils (Arsenic 40mg/kg; Cadmium 2mg/kg; Copper 200mg/kg; Mercury 1.5mg/kg; Zinc 600mg/kg; Petroleum Hydrocarbons C6-C9 150mg/kg; Petroleum Hydrocarbons C10-C36 1600mg/kg; Polycyclic aromatic hydrocarbons 80mg/kg; Polychlorinated biphenyls (individual) 1mg/kg. No Acid Sulfate Soil or Potential Acid Sulfate Soil is to be received at the Premises.) 	5186 and 12618
Cleanaway Co. Pty Ltd 42-46 Charles Street, St. Marys, NSW 2760	<ul style="list-style-type: none"> • Contaminated soil treatment • Non-thermal treatment of hazardous and other waste 	20271
Cleanaway Erskine 85-87 Quarry Road, Erskine Park, NSW 2759	<ul style="list-style-type: none"> • General solid waste (putrescible) as defined in Schedule 1 of the POEO Act • General solid waste (non-putrescible) as defined in Schedule 1 of the POEO Act 	20986
Dial A Dump Industries 76-82 Burrows Road, Alexandria, NSW 2015	<ul style="list-style-type: none"> • Soils (that meet the CTI thresholds for General Solid in Table 1 of the Waste Classification Guidelines as in force from time to time with the exception of the maximum threshold values for contaminants specified in the 'Other Limits' column) – also referred to as 'GSW-Recyclable' 	4679
SUEZ Kemps Creek Resource Recovery Park 1725 Elizabeth Drive, Kemps Creek 2178	<ul style="list-style-type: none"> • General solid waste (non-putrescible) including waste which is subject to general or specific immobilisation approvals which have a restriction that they may only be disposed of at waste disposal facilities which have currently operating leachate collection systems • Asbestos waste • Restricted solid waste (including wastes assessed as Restricted Solids Wastes which are also subject to general or specific immobilisation approvals which have a restriction that they may only be disposed of at waste disposal facilities which have currently operating leachate collection systems) 	4068

Facility Name	Lawfully Received Spoil Types	EPL
SUEZ Lucas Heights Resource Recovery Park New Illawarra Rd, Lucas Heights NSW 2234	<ul style="list-style-type: none"> • General solid waste (putrescible and non-putrescible) • Asbestos waste • Any waste that is below licensing thresholds in Schedule 1 of the POEO Act 	5065
SUEZ Wetherhill Park Resource Recovery Facility 20 Davis Road, Wetherill Park, NSW 2164	<ul style="list-style-type: none"> • General solid waste (putrescible) • VENM • Asbestos waste 	4548
Veolia Environmental Services 37 Grand Avenue, Camellia, NSW 2142	<ul style="list-style-type: none"> • General solid waste (non-putrescible) 	4806
Veolia Environmental Services Clyde Transfer Terminal Parramatta Road, Clyde, NSW 2142	<ul style="list-style-type: none"> • General solid waste (putrescible) as defined in Schedule 1 of the POEO Act • General solid waste (non-putrescible) as defined in Schedule 1 of the POEO Act 	11763
Veolia Environmental Services Horsley Park Waste Management Facility Wallgrove Road, Horsley Park, NSW 2175	<ul style="list-style-type: none"> • Waste that is below licensing thresholds in Schedule 1 of the POEO Act • Asbestos waste 	11584
Waste Science Pty Ltd Soil Recycling Facility 17 Turners Lane, Cootamundra	<ul style="list-style-type: none"> • Contaminated soil treatment (heavy metals, total polycyclic aromatic hydrocarbons (PAHs), Total Petroleum Hydrocarbons (TPHs), Phenols, cresols and Benzene, Toluene, Ethylbenzene, Xylene (BTEX) and Cyanide) 	13413

Appendix B – Waste Management Register

Date	Time	Waste Classification	Description Of Waste	Amount		Transporter		Receiving Facility		Waste Licence no.	Description of Waste Use (reused, recycled, stockpiled or disposed of)	Location of Reuse, if reused on site	Invoice no. / receiving facility ref. no
				(tonnes)	(m ³)	Name	Waste Licence no.	Name	Address				

Signature: _____

Date: _____

Appendix C – Material Movement Permit and Material Tracking Form

SECTION 1: GENERAL DETAILS							
Completed by Environment / Engineers	Permit No.	MMP #PERMIT NUMBER (Enviro)			Rev.	Date	
	Source Location				Chainage	Eg. CH600 – CH660	
					Depth (m)	Eg. below surface material to 0.7m	
					Stockpile ID	If material is stored in a stockpile	
	Material Type	Eg. Asphalt			Quantity (estimated)	m ³ / T	
	Report ID	Waste Classification Report					
	Waste Classification	<input type="checkbox"/> General Solid	<input type="checkbox"/> Restricted Solid	<input type="checkbox"/> Hazardous Waste	<input type="checkbox"/> ENM	<input type="checkbox"/> VENM	<input type="checkbox"/> Other: <u>Specify</u>
	Special Waste (Asbestos)	Yes / No			Bonded / Friable		
	Acid Sulphate Soils (ASS)	Yes / No			Treated / Untreated		
	Disposal subject to Resource Recovery Exemption and Order	Yes / No			Exemption / Order Name and Date <i>Review additional requirements or reporting of the exemption and order</i>		

SECTION 2: ON-SITE RETENTION					
Completed by Supervisors /		Yes	No	N/A	Comments
	Are materials being temporarily stockpiled?				Stockpile number and location. Add to stockpile register
	Are materials being re-used along the alignment?				Must be suitable for relevant land use State location within site
	Are the materials being sent to Camellia Asbestos Fill Location?				Attach

SECTION 3: OFF-SITE DISPOSAL					
Completed by Supervisors / Engineers		Response			
	Place of disposal (full name and address)				
	EPL License No. of receiving facility (if applicable)				
	Consignment / booking number				
		Yes	No	N/A	Comments
	Has Waste Class Report been sent to receiving facility?				Attach correspondence
	Is S143 Cert been exchanged (applicable only to non-licensed facility)?				
Confirm that trucks have GPS tracking (mandatory)					
Environment	Is the material suitable for receiving facility/location?				
	Are all required documents provided?				

REFER TO NEXT PAGE FOR PERMIT SIGNOFF

SECTION 4: PERMIT HOLDER				Completed by Permit Holder	
I confirm and accept the conditions stated in this Permit and associated work activity documents. I will ensure strict adherence to these conditions and all persons under my control will be advised accordingly.					
Permit Holder		Signature		Date & Time	

SECTION 5: PERMIT ACCEPTANCE				Completed by Environment	
I authorise work to proceed in strict accordance with the conditions stated in this Permit and supporting documents (Waste Classification Reports, Material Characterisation Reports)					
Permit Issuer		Signature		Date & Time	

SECTION 6: COMPLETION OF WORKS				Completed by Permit Holder	
I confirm that the material movement was undertaken in accordance with the conditions of this Permit and associated documents.					
Comments/Notes from the Works:					
Permit Holder		Signature		Date & Time	

SECTION 7: PERMIT SURRENDER				Completed by Environment	
This Permit has been surrendered for the works specified					
Permit Issuer		Signature		Date & Time	

SECTION 8: REVISION HISTORY (EPL 21647, Clause O4.1 e)				Completed by Environment	
Where the place of disposal changes after the plan has been made, an amendment to the plan can be made as an addendum that includes an update points a) to d) above					
Revision	Date	Change			
Rev 0		Place of disposal changes / classification changes / quantity changes			
Rev 1					
Rev 2					

Materials Tracking Form

Environment

To be prepared in triplicate
 (White copy – source site, Blue copy – destination site, Green copy – retained in book)

Material Movement Permit Reference:	
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Haulage Information

Transport Company	
Operator Name	
Truck Rego / Plant ID	
Truck Type	
PLR Section	
Date / Time Loaded	
Tipping Dockets Attached (<i>off-site disposal</i>)	<input type="checkbox"/> Yes <input type="checkbox"/> No

Material Information

Source Location (Chainage)	Depth	Material type	Destination	Volume (m ³)
Total				

 Driver (Name & Signature)

 Source Foreman/Supervisor (Name & Signature)

Appendix D – Environmental Representative Endorsement



21 October 2021

Transport for NSW

Attention to: [REDACTED]
Senior Manager Environment
Parramatta Light Rail
130 George St, Parramatta, NSW 2150

**Review of Appendix B8 – Waste and Resource Management Sub-Plan.
Infrastructure Works Stage 1 - Parramatta Light Rail
(PLR1INF-CPBD-ALL-WM-PLN-000001 Rev 11)**

Pursuant to SSI8285 Condition of Approval A23 (d) i), as the approved Environmental Representative, I confirm that I have reviewed the updated Appendix B8 – Waste and Resource Management Sub-Plan. Infrastructure Works Stage 1 - Parramatta Light Rail (PLR1INF-CPBD-ALL-WM-PLN-000001, Rev 11), dated 01/09/2021, prepared by Parramatta Connect, for consistency with the requirements of the Conditions of Approval.

In my opinion the aforementioned document remains consistent with the requirements included in or required under the terms of the Conditions of Approval for the Parramatta Light Rail (Stage 1) development.

Yours sincerely,

Australian Quality Assurance & Superintendence Pty Ltd (AQUAS)

A handwritten signature in black ink, appearing to be 'John', is written over a large black rectangular redaction box.

Filename : AQ1148.05 PLR CPBD WRMP rev11 endorsement 211021

For more information about the Parramatta Light Rail project, visit Parramattalightrail.nsw.gov.au

Call: 1800 139 389

Email: Parramattalightrail@transport.nsw.gov.au

