Rozelle Interchange
WestConnex

JOHN HOLLAND | CPB CONTRACTORS

Rozelle Interchange and Western Harbour Tunnel - Southern Tunnelling Works

2022-2023 Annual Sustainability Review

Project:	Rozelle Interchange and Western Harbour Enabling Works
Document Number:	RIC-JHC-RPT-00-EN-000-013
Revision Date:	29/06/2023

Document Approval

Rev	Date	Prepared by	Reviewed by	Approved by	Remarks
A	29/06/2023	[redacted]	[redacted]	[redacted]	Internal draft for review
0	31/08/2023	[redacted]	[redacted]	[redacted]	Final copy for issuing.

Contents

1 Background

The purpose of this Annual Sustainability Review is to present the John Holland and CPB Contractors Joint Venture (JHCPB) progress against the WestConnex Stage 3B: Rozelle Interchange and Western Harbour Tunnel Enabling Works Project (RIC) and Western Harbour Tunnel and Warringah Freeway Upgrade Stage 3A: Western Harbour Tunnel – Southern Tunnelling Works (WHT STW) objectives and targets set out in the Scope of Work and Technical Criteria (SWTC). This report provides an opportunity to detail the Project achievements between April 2022 to March 2023 and investigate opportunities for improvement for 2023-2024. The results from this report will be reviewed by key stakeholders including the Project Senior Leadership Team (SLT), client representatives– Transport for New South Wales (TfNSW), and other key stakeholders where relevant, and made publicly available on the Rozelle Interchange Project Website.

The Project has incorporated the addition of WHT STW to this review. This scope of works was a variation issued to the Rozelle Interchange and Western Harbour Tunnel Enabling Works Design and Construction Deed, to further the initial WHT enabling works completed from Emily St, Rozelle to Cove Street, Birchgrove. Points of note for this variation are:

- The same design and method are being utilised as per Rozelles tunnelling scope.
- There will be no fit out of the tunnel, the scope is excavation only – all mechanical and electrical and commissioning is out of scope.
- Approximately 1/3 of the road pavement will be installed and drainage adjacent to this pavement (not including external connections to external facilities such as water treatment plants or stormwater connections).
- Excavation material will be Hawkesbury sandstone, the same as RIC.

SWTC requirements remain the same for this variation and will be tracked the same as per RIC's systems, the IS rating addition of scope is discussed in Section 3.3, only change in targets is the APIC spend which has increase from $34 to $44.7 million.

1.1 Scope

This review presents project-to-date (PTD) data and outlines performance from the annual review period between April 2022 to March 2023. The annual review tracks the Project's performance against the sustainability requirements listed in SWTC D.5 Table D.5-2 and the nominated targets required under Appendix C.1 of the SWTC.

This review also details the progress towards achieving the Project's Infrastructure Sustainability Council (ISC) IS As-Built rating across seven main elements:

1. Energy and greenhouse gas (GHG);
2. Water;
3. Materials;
4. Waste;
5. Workforce training and participation;
6. Sustainable Procurement; and
7. Infrastructure Sustainability (IS) rating strategy.

2 Previous Annual Review

This is the fourth annual sustainability review required for the Project. Issues identified and recommendations from the third annual review are detailed in the table below. Updates on the status of implementation are also provided.

Table 1 Close out of 2021-2022 Actions

	Recommendation	Comment	Status for Q1 2023
1.	Switch M5 offices to Grasshopper Environmental to improve office waste diversion.	Grasshopper Environmental has a higher waste diversion rate than Bingo. The M5 offices are currently using Bingo, however improved performance can be achieved by switching suppliers. Preliminary discussions with the Project Managers at this site have begun.	The M5 offices have been converted to Grasshopper Environmental to help increase office waste separation.
2.	Continue to investigate soft plastic recycling options.	The Project is continually seeking to identify soft plastic recycling options to enhance diversion rates by liaising with existing and potential suppliers. While to date the Project has been unable to find a satisfactory solution, the Project should continue to investigate opportunities in 2022-2023. The primary issue remains a lack of suitable recycling infrastructure in NSW.	The project had liaised with waste companies such as grasshopper and bingo to find solutions. An avenue of soft plastic recycling with incoming packaging was assessed, this involved using a baler to compress and bundle loose soft plastics, this was not continued due to lack of companies willing to take the waste stream and low return on investment.
3.	Implement biodiesel transition.	JHCPB has been investigating opportunities to use B5 biodiesel on the Project site. In 2022-2023, recommend commencing roll out of this on a small-scale, and increasing volumes if successful and where supported by a cost-benefit analysis.	Bio-diesel has been implemented onsite since July-22 and the project has used 59kL since then. Bio-diesel is currently being included in the WHT STW scope for larger plant.
4.	Continue geopolymer trials.	One geopolymer trial has been undertaken on site to date. Recommend ensuring additional on-site trials are undertaken in the 2022-2023 period to ensure continued momentum for the research.	The Geopolymer trial is ongoing with its second pour occurring within the reporting period, development of the mix is ongoing with future trials continuing on other John Holland projects as mix is finalised.
5.	Identify further opportunities to use bespoke low carbon concrete.	While the bespoke low carbon concrete continues to be used on site, recommend further discussions with the site teams to identify additional application opportunities, including in permanent pavement.	Project has implemented Envisia ; it is being regularly supplied to the project and used within kerbs, footpaths and F-Type barriers.
6.	Finalise a system for calculating total material spend on the Project	The Project's approach to the Mat-2 credit requires a calculation of total material spend on the Project. Recommend discussing with the commercial team the best method to export this data from Project systems.	The project is in the process of developing this, further work is required to finalise this due to the difference between the way construction contractors build tender estimates and ISC requirements.

	Recommendation	Comment	Status for Q1 2023
7.	Continue to identify opportunities to increase office waste diversion percentages.	Office waste diversion has been tracking in the right direction. However, the Project should continue to consider methods to increase office waste diversion to ensure achievement of Was-2 Level 2.	Other than M5, other sites such as the training academy and WHT offices have had office recycling audited.. Actions implemented from these audits were procuring bins that allow for more visible separation and separated skip bins for paper/comingled waste.
8.	Continue to use the Multi-Criteria Analysis tool to capture significant decision making on the Project for Man-7	The Man-7 credit requires significant decisions on the Project to be assessed using qualitative and quantitative criteria. A tool has been developed to facilitate this process, and it is recommended this continue to be used going forward.	Rozelle is tracking significant decisions through any risk and design changes. From these decisions, ones identified as significant will be assessed using the MCA tool.
9.	Submit Dis-1 Credit Interpretation Request (CIR) to ISC for consideration and determination.	The Project is seeking a ruling in regard to the Dis-1 Level 2 credit (peak stormwater flows). A CIR has been prepared and pending a final internal review should be sent to ISC for consideration and determination.	CIR for Dis-1 has been reviewed and submitted, ISC's response suggests a social, environmental and geomorphic assessment to be developed on its effect of increasing peak stormwater flow. This assessment is being conducted by an external consultant.
10.	Conduct an internal bin audit of all sites and implement recommendations where warranted.	The bin layout and ratio of general waste to recycling bins should be reviewed and optimised to enhance office waste diversion rates.	As per #7 a site wide bin audit was conducted to assess how accessible recycling was over the project. The outcomes of this were supplying additional recycling bins in offices where it was lacking.
11.	Consider ways to optimise Return and Earn bin performance.	The Return and Earn bins have recently been installed on the Project surface sites. It is recommended to monitor the progress of this initiative and identify/implement opportunities to enhance performance if required.	Return and Earn was trialled and given toolboxes to spread information of use and benefits to project. It has proven very effective in smaller sites such as ICL/VRE where a culture can be created/retained.
12.	Update water, materials, waste and energy forecasts.	As a result of additional scope awarded to the Project during the reporting period, the forecasts for water, materials, waste and energy will require updating. Recommend this occur prior to As-Built submission.	The sustainability team in coordination with the WHT plant and engineering team has developed a forecast for material/water/energy consumption for the WHT scope.
13.	Propose 100% GreenPower to TfNSW for consideration.	Increasing the Project's green power consumption is an easy and effective way of reducing the Project's GHG emissions impact. It is the best value ($/$CO_2$-eq) means of reducing the Project carbon footprint. Recommendation to open conversations on this with the client.	The project is increasing Greenpower when its EnergyAustralia contract is renewed in Aug-22. Due to the extension in contract from WHT this will allow time for this increase to contribute towards the overall project %.

	Recommendation	Comment	Status for Q1 2023
14.	Purchase energy offset credits in line with SWTC requirements (6%).	The tender for offset purchase has been prepared, and should be issued to market in the 2022-2023 period.	Procurement of carbon offsets has been finalised. The project has calculated the total tonnage of carbon the project must offset, alongside finding an offset project which is risk adverse and has significant social benefits. Details will be stipulated in the next review.
15.	Propose increasing the volume of biodiesel to TfNSW	Unlike electricity there is no direct means to prevent emissions related to fuel. The emissions intensity of biodiesel is significantly lower than fossil fuel sourced diesel. This option should be presented to TfNSW.	Increasing the volume of Bio-Diesel was trialled within WHT STW within a bulk tanker. This trial has been paused due to the premium being 37.5c/L which is significantly higher than the proposed 5c/L threshold.
16.	Lock in strategy to achieve innovation credits	In the Project's ISC Design submission, a number of innovation credits did not achieve verification due to challenges identifying a peak body verifier considered suitable by ISC. In 2022-2023, a new strategy should be established to ensure these credits are verified in As-Built.	Strategy for innovation credits has been developed and assessed to what level each innovation will obtain. Relevant independent bodies have been identified and are in the process of being enagaged.

3 Sustainability Performance

Table D.5-2 of the SWTC describes the minimum sustainability targets JHCPB needs to achieve in the design and construction of the Project. Table 2 details JHCPB's current performance against these requirements.

Table 2. Performance against the Project Sustainability Targets

Category	Minimum Requirement	Performance PTD
IS Design Rating	55/100	88.8
IS As-Built Rating	55/100	Rating expected 2025
Percentage of usable spoil (uncontaminated surplus excavated material) reused/recycled.	80%	98.15%
Percentage of construction and demolition waste (uncontaminated material excluding spoil) reused/recycled.	80%	92.60%
Percentage of construction stage energy sourced from renewable energy generated onsite and/or accredited GreenPower	20%	18.9%
Percentage of construction stage energy use offset (in accordance with the Australian Government National Carbon Offset Standard)	6%	In progress. Project is preparing to go to market to purchase offsets.
Percentage of annual operational stage energy sourced from renewable energy generated onsite and/or accredited GreenPower	6%	Operator requirements
Percentage of non- potable water demand which is sourced from non-potable water sources during construction.	15%	86.00%

Category	Minimum Requirement	Performance PTD
Percentage of non-potable water demand which is sourced from non-potable water sources during operation.	15%	Opportunities to meet and exceed demand are in progress
Percentage of water (rainwater, stormwater, wastewater, groundwater, tunnel inflow water) generated/collected during construction which is reused, recycled or reclaimed.	15%	10.33%
Percentage of water (rainwater, stormwater, wastewater, groundwater, tunnel inflow water) generated/collected during operation which is reused, recycled or reclaimed.	5%	Opportunities to meet and exceed demand are in progress
Percentage of cement replacement material, measured by mass, used in concrete during the construction stage.	5%	37.17%
Percentage of recycled material used in road base and subbase during the construction stage.	10%	62.36%
The Project Company must source 100% of all timber products used in the Project from either reused/recycled timber or from sustainably managed forests that have obtained Forest Management Certification (FMC).	100%	92.52%

The identification and tracking of sustainability opportunities and initiatives is integrated with the Project-wide risk management approach. Identified sustainability opportunities are recorded in the Project *Sustainability in Design & Construction Opportunities Registers* and assessed on a feasible and reasonable basis considering whole of life Project impacts.

3.1 Key activities

The key activities undertaken during the reporting period are set out in Table 3.

Table 3. Construction Activities 2022-2023

Location	Activities 2022-2023
Tunnels	• WHT excavation commenced • 6 Roadheads in operation to date for WHT • WHT Water Treatment Plant commissioning • M&E continues substation fit out and cable pulling for commissioning • TCF continues for tunnel pavement and structural works • Demolition of Tunnel Shed C • RIC tunnel excavation completed
VRE	• Various utilities /ITS works e.g. Anzac sign bars installed, camera installations • Various M&E works e.g. cable & fibre hauling • Drainage works • Victoria Road Bridge complete • Hornsey St bus bay construction and opening • Permanent retaining wall installation • Permanent roadworks including final wearing course (asphalting) • Bulk excavation of cut and covers and dives including material haulage • Landscaping works • Cut and cover and dive construction • Major traffic switches • Demolition of Eastern Temporary Access Road (ETAR) • Demolition of Western Temporary Access Road (WTAR) • Construction of Eastern Shared User Path towards Anzac • Construction of Western Shared User Path towards future parklands • Construction of permanent public staircase – East and West of Victoria Rd Bridge • Commence M&E fit out in the M4 WB Cut and Cover • Construction of Lilyfield Rd pocket park (south)
ICL	• Cut and Cover FRP • Piling works • Bulk excavations of dives • Permanent and temporary ground support • Asphalting works • Pavement subgrade and pavement works • Bulk excavation works • Shared user path works • Permanent road works – including barriers and kerbs • Street Lighting installation • Sub-station commissioning works • Temporary barriers and bus bay adjustments • Commenced permanent restoration works for utility areas • Sydney Trains pilot cable • Landscaping works • Ventilation Facility structure completed • Architectural green wall façade of ventilation facility underway

RRY	• Ventilation Facility construction underway and shaft excavation completed • Vertical gardening works of Ventilation Facility completed • Architectural steel bridge structures of Ventilation Facility completed • Demolition of Water Treatment Plant C • M4 Cut and cover, roof slab completed • M4 Cut and cover backfill works • Demolition of Gordon St office • Backfilling works at decline B and C completed • Spoil haulage and off-site disposal • Utilities work • MOC2 buildings, pump rooms, substations underway • Drainage channel excavation ongoing • Landscaping works • Wetland ponds construction commenced
CWL	• Utilities works (Ausgrid, Sydney Trains, Jemena, Sydney Water) • Drainage works • Bulk earthworks • Dredging marine sediment for scour protection & drainage channel • Piling works – bored piling/sheet piling • Abutments, capping beams and piers for bridge scope • Retaining wall construction for land bridge ramp • Steel girder installation at Pigtail Bridge & Land Bridge • Concrete plank installation at Whites Creek & City West Link Drainage Bridges • Various road construction activities - road furniture installation, kerbs & line marking • TCS & ITS works • Barrier construction • Temporary and permanent pavement works • Landscaping works

3.2 Management and Governance

The Project Sustainability Management System aligns with IS V1.2 Man1-Man7. A regular audit schedule ensures that the management system meets SWTC requirements and ISC targets. In addition, management and governance actions are reported regularly to senior management via weekly face-to-face meetings, and quarterly and annual reporting processes, with feedback regularly provided. Management and Governance actions completed by the Sustainability team during the review period are listed below:

- Six-monthly Independent Sustainability Professional (ISP) reviews undertaken by:
    - Environment & Sustainability Manager for Infrastructure and Major Projects (John Holland Group)
    - Sustainability Specialist for Infrastructure and Major Projects (John Holland Group)
- Quarterly Sustainability Audits undertaken by:
    - Environment & Sustainability Manager for Infrastructure and Major Projects (John Holland Group)
    - Sustainability Specialist for Infrastructure and Major Projects (John Holland Group)
    - Environment Manager (Internal – JHCPB)
- Annual independent stakeholder audit conducted by John Holland Stakeholder Community Engagement Manager to meet Sta-3 and Sta-4 IS credit requirements (04Mar23). No non-conformances received, and the Project was commended for the promptness of responses to community issues ahead of requirements.
- Waste to Destination (W2D) audits were conducted, on the following streams:
    - General waste: Environmental Treatment Solutions – Veolia (28Jun22)
    - Spoil haulage and disposal: Sydney Gateway Project (16Nov22)
- Energy monitoring and modelling audit undertaken (28Apr22) by CPB Sustainability Manager reviewing methods of tracking electricity and fuel usage on the project. The sustainability energy model was also review and suggestions around validating model for As-Built data given.

3.3 Design

Following the Project's IS Design score of 88.8 awarded, the sustainability team has begun developing the As-Built submission following feedback from verification from the R2 submission. The details of credit development and feedback incorporation from Design is illustrated in Section 4.7.

The project has collaborated with the Design team throughout the reporting period regarding:

- Setting up and amending the Climate Change Adaptation Plan to include the scope and associated climate risks regarding WHT STW. This is being drafted and will be delivered early Q2 2023.
- Addressing ISC requirements and comments for Lan-4 Flooding Mitigation. The team has coordinated with the design team to provide flood maps catered towards the IS submission and addressed comments regarding flood modelling for climate change.

The Project has also continued to focus on the incorporation of low carbon alternatives into design, with a particular focus on utilising alternative concrete mixes that use a high proportion of supplementary cementitious materials. This has included:

- Using the mix design approved for 3x C&C protection slabs, the project was able to integrate this Low Carbon Concrete (LCC) mix into the base layer of stone pavements and rubber soft falls which are permanent pieces in the parklands. This is to be implemented over the next review period.

- Continuing to participate in a bespoke geopolymer and glass sand mix trial in partnership with UNSW, TfNSW, John Holland and Boral. The second Geopolymer pour was 2x 1.5m3 blister island slabs located on Brenan St (06Sep22). This pour worked from the initial trial lessons learnt to further improve the mix, there was improvements from the initial pour on workability and strength. Further developments have been made to improve the mixes workability after extended mixing in Agitator.

Value engineering has been incorporated throughout the Western Harbour Tunnel – Sothern Tunnelling Works design. Through adjustments of tunnel orientation alongside innovation with access and facility location the project was able to reduce 170,255t of carbon through this re-design, this was later submitted towards the “Excellence in Environmental Outcomes” ISC awards 2023. The following initiatives contributed towards this saving:

- Eliminating the temporary construction site at the corner of Victoria Road/Darling Street by establishing a spoil load-out zone within the pre-existing WHT C&C.
    - Reduction in program, resource consumption, sensitive receiver, and community broader impact.
- Optimising the driven tunnel alignment.
    - Reduction in program, resource consumption.
- Optimising the ventilation tunnel alignment
    - Reduction in program, resource consumption.

3.4 Procurement

The Sustainability team continued to work with the Commercial Team on:

- Showcasing of APIC spend within Sustainability Quarterly Reports. Aboriginal Participation in Construction spend targeted at $44.7 million. At the end of the reporting period, $133.1 million had been spent, ~298% of the target.

- Non-cost evaluation of tenders. Non-cost evaluation equates to 25% for each package.

- Ensuring emphasis on local procurement was maintained: 99% of all contracts awarded in Australia, 84% in New South Wales, 37% in Greater Western Sydney and 13% locally awarded (City of Sydney and Inner West City Councils).

- Engagement with high-value subcontractors to identify sustainability opportunities pre- and post-contract award, including Grasshopper Environmental (waste disposal contractors) and H.L. Landscapes (final parklands design and landscaping),

Actions relating to the sustainable management of resources on the Project are listed below:

- Over 14% of excavated spoil has been beneficially reused on-site through careful planning and cross-discipline cooperation, including for the establishment of piling pads, construction platforms, temporary bunding, backfill and more. Excavated tunnel spoil has been retained on the Project for use in final parkland backfill by the surface works team, with significant material and truck mileage (emissions) savings anticipated as a result.

- Continued utilisation of bespoke low carbon concrete (LCC). At the date of review the Project had implemented:
    - Bespoke LCC**:** 3,445m^3.
    - Recycled Glass Sand: 150 T= ~825,000 glass bottles
    - Emesh (recycled plastic fibres)**:** 4560 kg

3.5 Stakeholder Engagement

The team worked with the Stakeholder Engagement Team to ensure Sta-1 to Sta-4 credits were adequately addressed through the Communication Strategy as well as through community notifications, and stakeholder engagement channels.

The Stakeholder Engagement team continues to use the approved Digital Engagement Strategy. The team continues to receive positive community feedback in response to the digital engagement strategies. A weekly digital communication is sent to 5000 residents including tailored tunnelling email notifications depending on location.

Stakeholder engagement actions undertaken during 2022-2023 are also summarised below:

- The Rozelle Interchange hosted 15 toddlers and their parents from the local preschool 'Rozelle Community Childcare Centre'. (05Dec22)
- Family Day hosted for workers and family members to come onsite for site tours, food, carnival games, face painting, a petting zoo, over 500 people were in attendance and 2.5K raised for the Harding Miller Foundation. (18Jun22)
- In June 2022 a survey was distributed to residents and businesses, this aimed to gather general feedback about our project communications, content and the way they receive information.
- Introduced the Annandale Troll (art work) to his home underneath the Light Rail bridge.
- Community Day at Rozelle Rail Yards held with 250 members of the community visiting the site. (21Aug22)
- $68,000 raised for the Harding Miller Foundation during the Project’s end of year Gift Drive.
- Ongoing fortnightly meeting with TfNSW communication and Stakeholder team to discuss the project updates.
- Ongoing meetings with Inner west council every two months to discuss project update and any parking issues in the community.
- Quarterly updates continue to be sent to between 4500 and 6000 subscribers.
- On-street parking checks ongoing in response to community feedback, to discourage unreasonable worker parking occurring 2x a week.
- Bi-weekly street clean-ups ongoing.

3.6 Knowledge Sharing

The Project team continue to pursue knowledge share opportunities to ensure the preservation of intellectual capital and continual improvement processes from one Project to another. The following knowledge share opportunities were participated in during the 2022-2023 reporting period.

- Junglefy tour and knowledge share, the sustainability team was given a tour of the facilities of Junglefy's labs at UTS. The benefits that plants have on ambient carbon reduction along with examples of implementation and studies conducted were shown. (15Jun22)

- TfNSW road projects knowledge share, the RIC sustainability team presented on social procurement and training alongside low carbon concrete initiatives onsite. This was received by TfNSW and wider projects under them. (26Jul22)

- Sustainability team presented at the Engineers Australia professional forum on geopolymer, bespoke low carbon concrete, and social initiatives on the Project. (14Jun22)

- John Holland Sustainability Specialist Knowledge share:

    - Early subcontractor engagement prior to tendering was presented to the wider JH team, this sets up a good platform and how to for meet the requirements of the Pro-2 IS credit. (29Sep22)

    - The project presented on its Supplier Sustainability Performance Monitoring Meeting system and reporting accountabilities to the wider JH group, this was a part of the sustainability tools event.

- TfNSW/Transurban Sustainability team bought onsite to discuss initiatives and project development details, this gave a great platform for sharing advice and potential ideas. (18Oct22)/(24Oct22)

- Operational Sustainability and Environment Forum (OSEF) #4 & 5 were attended.

- WestConnex Sustainability Knowledge Share Workshop – Meeting between RIC, M4 & M5 link, TfNSW and Transurban. (17Nov22)

- Monthly CPB Tunnelling BU meetings between RIC, M6, SBT, ETP and Cross River Rail. This platform allows for discussion on general initiatives and IS rating progress/advice for credits.

3.7 Workforce and Skills Development

The Sustainability Team worked closely with the People and Capability Team (P&C) to ensure targets and actions related to workforce and skills development are tracked monthly with information relayed to the Sustainability Team on a quarterly basis. Actions undertaken to the date of report include the below:

- Continued focus on diversity in employment on the Project resulting in:

    - 13.8% female Senior Leaders

    - 46% of the women engaged are in Non-Traditional roles

- 4.39% of all JHCPB inducted personnel identify as Aboriginal & Torres Strait Islander

- Sustainable job starts = 644 personnel engaged on the Project for over 6 months, who were previously unemployed for > 6 months.

- JHCPB has surpassed the overall Skills and Employment target of 296 points reporting 3072 points by Q1 2023.

4 Performance per Target Area

4.1 Energy and Greenhouse Gas Reduction

4.1.1 Operational Energy and Greenhouse Gas Reduction

Implementing sustainability in design has the greatest potential to reduce energy consumption over the life of the asset as over a 50 year period 95% of greenhouse emissions related to the project can occur during the operational phase. During the tender, several opportunities to reduce operational energy and GHG emissions, including renewables, were identified and these are detailed in the Sustainability Plan. Updates on the opportunities are summarised in Table 4.

Table 4. Operational Energy Reduction Opportunities identified in the Sustainability Plan and EEGHES

Opportunity	Description	Status
LED lighting design	Reduced energy and resource consumption through an LED lighting design. The design significantly reduces the number of fittings required in comparison to similar existing NSW tunnels which use end-to-end fluorescent fittings or high-pressure sodium lights. When compared to interior zone tunnel high-pressure sodium (HPS) lights, as used on the East Link and Airport Link, the number of fittings can be reduced with LED lights as they can be oriented to spread the light evenly whilst meeting lighting standards. LED light banks also have a longer operational life and lower operational power demand	Implemented
Optimised Ventilation	Reduced power consumption through the design of the ventilation system, which incorporates low pressure fans that consume about 50 per cent less energy compared with a high-pressure fan solution. These low-pressure fans are oriented vertically which also reduces the total ventilation structural footprint by 20 to 30 per cent, reducing the amount of embodied energy associated with construction materials used.	Implemented – 335 and 450kw fans have been procured and are being commissioned.
Drainage pumping	A single low point sump system within the tunnel uses gravity to reduce the energy requirements to pump water to the water treatment plant on the surface when compared to a multiple sump system. The use of a single point reduces materials and maintenance requirements.	Implemented
Road design	Road and tunnel design will be optimised to minimise energy consumed by vehicles using the motorway, reduce greenhouse gas emissions, and reduce the demand on the tunnel ventilation system e.g. tunnel grades limited to 4%.	Implemented

Opportunity	Description	Status
Renewables	A feasibility study will be conducted to explore potential renewable energy options, particularly on the roof of the Motorway Operations Centre and maintenance facilities. This will reduce operational GHG emissions by supplying renewable power directly to the facility and back into the tunnel.	Optimisation of the building design to enable future placement and maintenance of panels. The option to install PV panels during Project delivery was presented to TfNSW and Transurban who have decided not to implement.

These opportunities have been transferred to the *Sustainability in Design Opportunities Registers* and have been tracked through the detailed design phase to demonstrate savings as part of the IS Design Submission.

In addition to the opportunities identified during the planning phase, the JHCPB design team have been able to identify additional areas for reducing the operational energy demand, which are listed in the *Sustainability in Design Opportunities Registers*. The designers have identified the following opportunities:

Table 5. Operational Energy Reduction Opportunities identified in the Sustainability in Design process and submitted as part of R1 Design-IS V1.2

Opportunity	Description	Status at Q1 2023
Optimisation of in-tunnel fan speeds	Enabling the system to be tailored to traffic volumes (i.e. low fan speed or less fans operating during low traffic periods) to reduce energy consumption.	Procured and being constructed and commissioned.
Optimisation of transformer sizes	Transformer size optimised to reduce electrical loads (10% reduction in electrical demand expected)	Procured and being constructed and commissioned.
MVAC- HVAC system requirements improved for energy reduction	Cooling requirements reduced to 27C from 24C at EER and LV switch rooms. Cooling requirements reduced to 30C at substations and HV rooms.	EER's and LV Switch rooms – procured and being constructed and commissioned to 27C. HV Rooms – procured and being constructed and commissioned to 30C.
Optimisation of design of tunnel fans	Type and layout of tunnel fans optimised to reduce motor size and tailor motor sizes for each ventilation location as opposed to larger motors and standardised sizes across Project.	Procured and being constructed and commissioned.
Brushless Fan motors	Brushless motors included in design to increase energy efficiency	Not implemented: Due to incorrect sizing of fans denoted in initiative, does not hold the same savings – not pursued.
LED lighting	Use of LED lighting underground - including transition zones and ancillary zones	Implemented

4.1.2 Construction Energy and Greenhouse Gas Reduction

Table 6. JHCPB Construction energy reduction target

Category	Requirement/ Target	Performance PTD
Percentage of construction stage energy sourced from renewable energy generated onsite and/or accredited Green Power	20%	18.9%

Table 7. Construction Energy Reduction Opportunities identified and assessed in the Sustainability Plan and EEGHES

Opportunity	Description	Status
Carbon Offset	6% of construction energy use will be offset in accordance with the Australian Government National Carbon Offset Standard.	Reviewing contract to procure 8910 tonnes of carbon to fulfill SWTC requirement, of 6% of construction energy use. Social benefits incorporated into projects chosen. To be procured May23.
Accredited Green Power	20% of construction energy to be 100% renewable either through onsite renewables or purchase of Accredited Green Power.	18.9%

Opportunity	Description	Status
Local Procurement	Producing or procuring goods and services locally to reduce transport fuel emissions.	37% suppliers from GWS, 13% supplier from City of Sydney and Inner West Council. 99% of all contracts awarded to Australian-based companies.
Alternative, lower carbon materials	Considering emissions intensity of construction materials e.g. concrete, asphalt and steel.	The below have been implemented in permanent non-structural works: • Envisia (up to 70% cement replacement) • Emesh • Glass Sand • Geopolymer concrete trials
Plant and equipment emissions	Evaluating fuel efficiency as part of construction plant and equipment selection and ensuring appropriate emissions testing is undertaken.	Implemented. EPA tier 3 compliance is mandated in Plant contracts and assessed via onboarding inspections & testing.
Solar powered lighting	Trailer mounted lighting towers fitted with solar panels, battery storage system and LED fixtures are now a viable alternative to diesel powered lighting towers. These towers will be used in preference to traditional diesel driven lighting towers wherever possible, particularly during site establishment.	Implemented at Surface Works sites where feasible
Spoil handling	Minimising the double-handling of spoil to reduce transport fuel emissions. This will include the sharing of spoil between the Project sites and other external sites where appropriate.	Implemented
Increase in GP purchase	Increasing GP purchase during delivery to >40%	In progress. The Project is tracking at 18.9% GreenPower, this percentage will be increased in Aug23 upon contract renewal.

4.1.2.1 Electricity Use

The Project has committed to purchasing 20% Green Power as the preferred method to meeting the renewable energy target (rather than generating solar energy).

The Tunnels power contract was awarded to Energy Australia in October 2019 and includes the 20% GreenPower requirement. Tunnel Power commenced in April 2020, and performance against the Project target is provided in Figure 2.

The Project recommended increasing its Green Power purchase commitments to ensure the 20% target was met, this contract is being renewed in Aug23 to which the green power will be increase for RIC +WHT. Project to date Green Power consumption across tunnel and surface works is currently tracking at 18.9%. There is a notable spike in Nov22, this was due to a large portion of unaccounted for energy (UFE) bringing down our consumption, green power is supplied outside of this factor so was not effected.

It is estimated that 146,488,758 kWh of electricity has been consumed on the Project to date (Figure 1). Of this, 41,524,912.64 kWh was consumed during the review period. The Energy Model estimates that 291,563,000 kWh of electricity will be consumed during the construction phase of the Project. This figure includes electricity consumption of tunnelling machinery, tunnel lighting and ventilation during construction as well as site offices, crib sheds, and other onsite electrical plant and equipment, this figure obtained from the energy model has been updated to include the scope of WHT STW.

The electricity used to date represents 50% of the total estimated electricity consumption for the construction phase of the Project (RIC scope only). Based on the Energy Model estimate, the PTD electricity consumption appears to be lower than projected due to the assumptions that were made to the energy model in Design from the burn rates provided.

Electricity consumption is tracked via monthly invoices from two main suppliers:

- Energy Australia - main supplier for tunnel electricity
- Shell Energy - main supplier for surface works

During the review period, the number of operating road headers changed from 3 to 6 as all tunnelling resources have converted to WHT STW excavation, all road headers for this project are running. However, energy consumption from ventilation and lighting has increased as the expanse of excavated tunnel requiring ventilation and illumination has increased. Figure 1 illustrates the monthly breakdown of electricity consumption across the Project. The review period is outlined in red.

The Project's performance on Green Power purchase is on track to meet targets.

Figure 1. Electricity consumption on the Project PTD

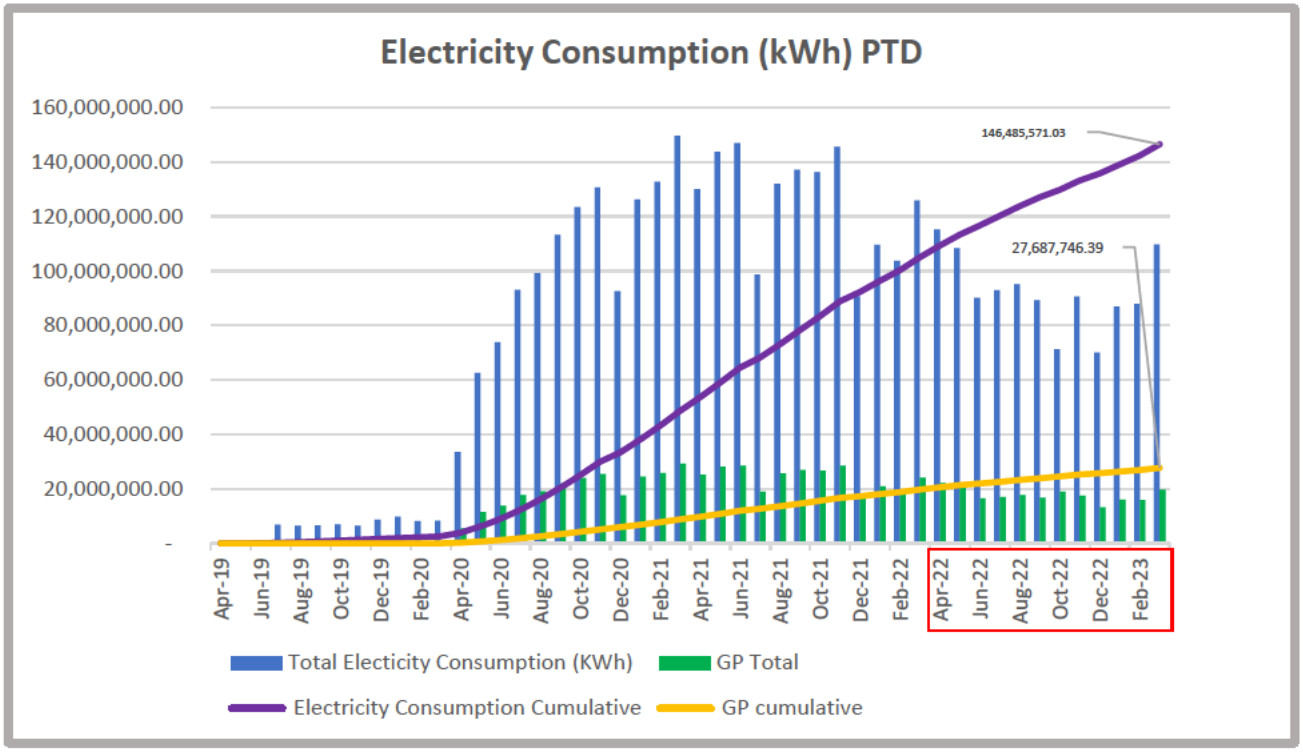
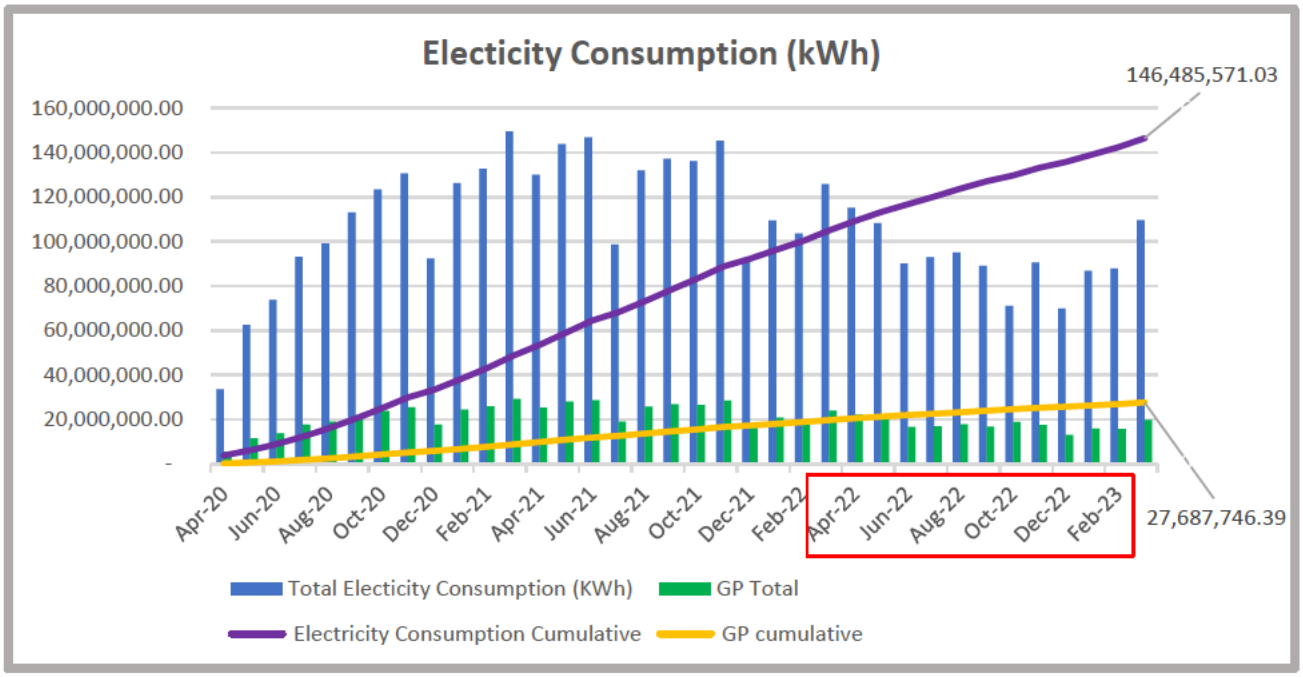


Figure 2. Green Power Purchase Performance 2022-2023 PTD



4.1.2.2 Fuel Consumption

Fuel usage is also an important contributor to the consumption of energy and generation of greenhouse gas emissions. The Energy Model for the Project estimates that 25,884 kL of diesel and 754 kL of petrol would be consumed in the construction of the Project (26,638 kL in total fuel). This includes mobile construction plant and equipment and excludes haulage.

Fuel consumption during delivery is tracked on a monthly basis using invoicing from Refuelling Solutions, the Project Wide fuel supplier, and data supplied by contractors in line with the National Greenhouse Gas and Energy Reporting (NGERs) Act 2007. NGERs data is tracked through a digital platform for subcontractor reporting (Project Pack Web).

During the review period, a total of 3,096 kL of diesel and 18 kL of petrol was consumed on the Project for a combined fuel consumption of 3,114 kL. To date, 16,542.85 kL of fuel has been consumed. This equates to 62% of the forecasted estimate for fuel consumption. Monthly and cumulative consumption of Diesel and Petrol are presented in Figure 3 and Figure 4 respectively. This model has been updated to include the scope of WHT STW, this would have lowered the usage % due to the addition of works.

Biodiesel is considered a greener alternative to pure diesel, with each 100L of B5 used emitting approximately 13.5kg of CO_2 less than ordinary diesel and offers other safety benefits including reduced VOCs and a higher flashpoint. Bio-diesel has been implemented onsite, initially being delivered in a designated IBC for eligible plant. Since then, bio-diesel has been addedinto the main fuel tank for WHT, this allowing for it to be used in larger plant in a lower concentration than 5% and will not inhibit supply. 59,128L has been used within this review period.

Figure 3. Fuel consumption on the Project - Diesel PTD

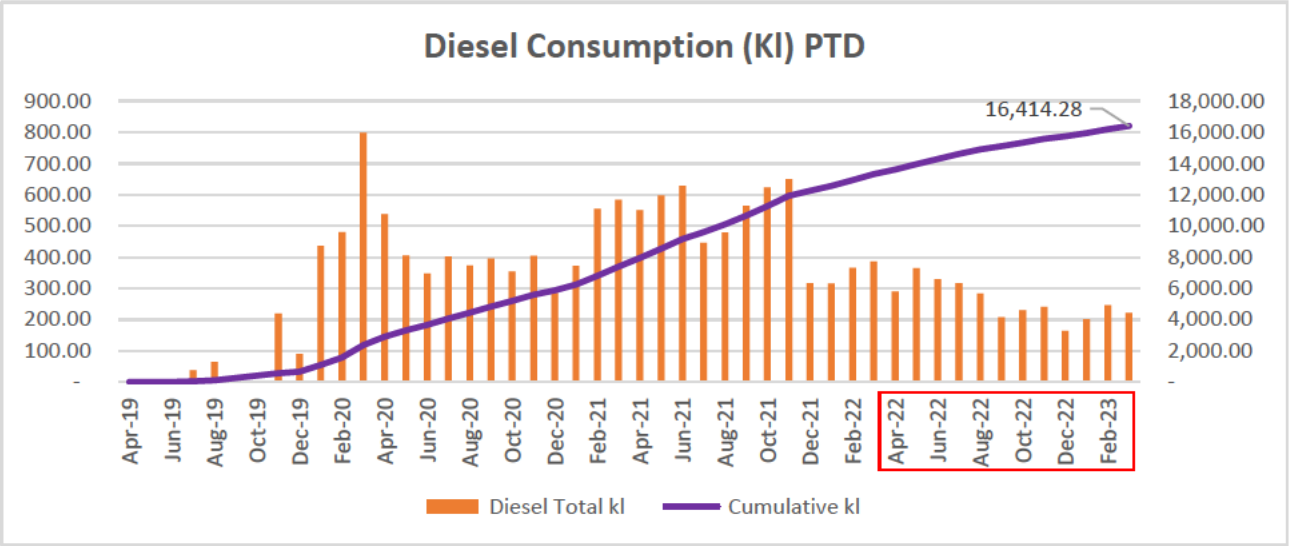
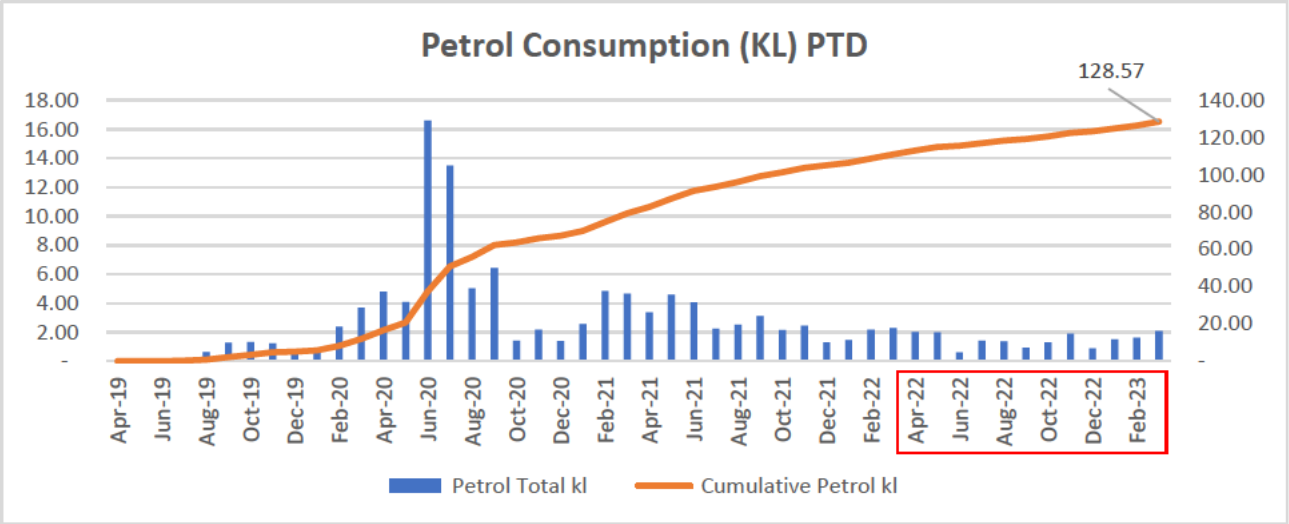


Figure 4. Fuel Consumption on the Project – Petrol PTD

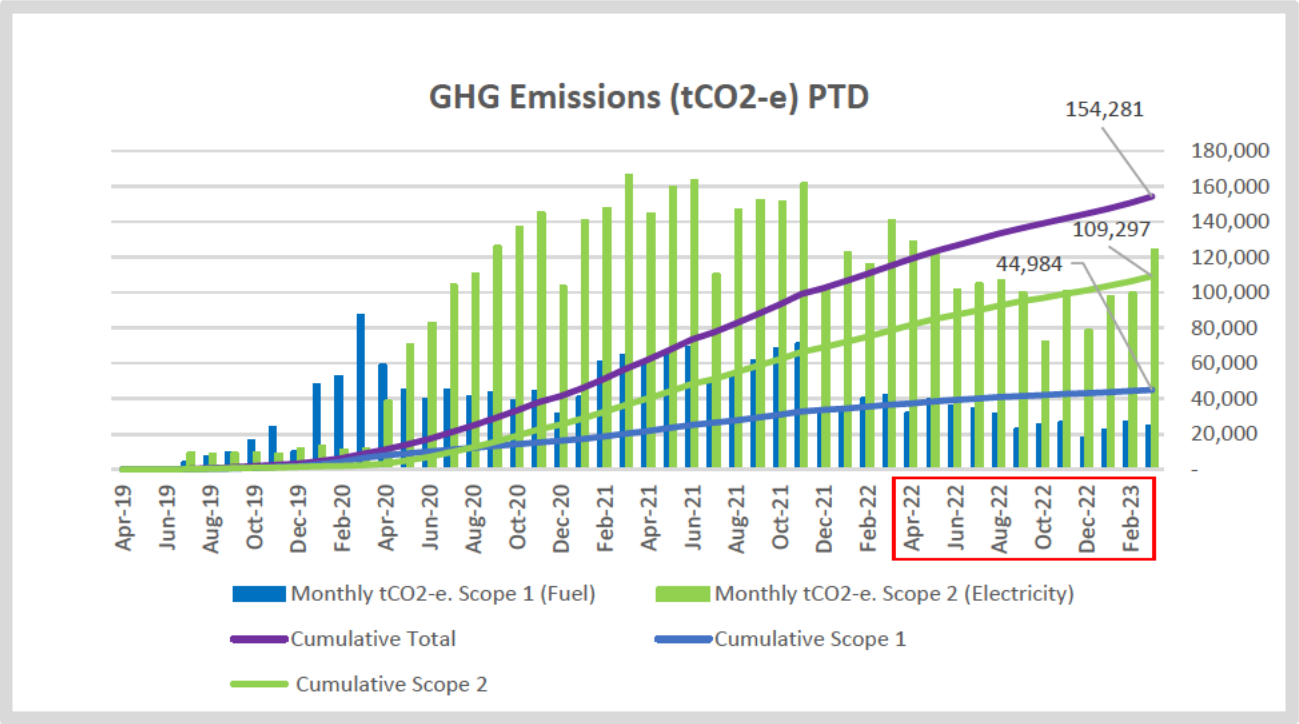


4.1.2.3 Greenhouse Gas Production

Figure 5 displays the current tonnes CO_2 (Scope 1 & 2) generated from the project as a result of electricity and fuel consumption. The most recent update of the model estimates 233,295t CO_2 during construction. The Project has currently emitted 138,238t CO_2, of which 33,901t CO_2 correspond to the review period. Project to date emissions amounts to 59% of the Project's forecasted emissions. This figure from the model is inclusive of the WHT STW scope which has decreased the overall usage % due to the addition of works.

The project is required to offset 6% of construction stage energy consumption. At the date of review, electricity emissions amounted to 93,653t CO_2 and fuel emissions at 44,584t CO_2. The project will utilise the Energy Model and internal forecasts to model the remaining energy consumption. The Project Sustainability team has worked with the commercial team to prepare a tender for offset purchase, which will soon be issued to market in line with SWTC D.5-2.6 and IS V1.2 Ene-2, the project will focus on procuring offsets with additional social benefits alongside carbon abatement.

Figure 5. GHG Emissions on the Project



4.2 Water

4.2.1 Operational Water

Table 8. JHCPB Operational water reuse targets

Category	Requirement / Target	Performance PTD
Percentage of non-potable water demand which is sourced from non-potable water sources during operation.	15%	In Progress. Reuse opportunities for irrigation including the use of a small reverse osmosis plant for salt removal from treated water from the operational water treatment plant, this has been implemented in July23.

Category	Requirement / Target	Performance PTD
		Rainwater tanks at operational facility has been designed and implemented.
Percentage of water (rainwater, stormwater, wastewater, groundwater, tunnel inflow water) generated/collected during operation which is reused, recycled or reclaimed.	5%	As above

An operational water reuse strategy has been developed and is with DPIE for comments, this will detail the assessment behind water reuse for the operator for RIC.

Implemented water reuse opportunities and efficiencies during detailed design include:

- Rainwater harvest tanks for domestic purposes at operational facilities (MOC2)
- Water Efficiency Labelling Scheme (WELS) rated tapware specified at operational buildings and public use facilities
- Recirculation and capture of fire Hydrant and deluge pump test water
- Operational water treatment plant media filter washing

In addition, the treatment of tunnel groundwater during operations for irrigation and tunnel washing via a reverse osmosis water treatment plant has been approved by the client and is being implemented.

4.2.2 Construction Water

Table 9. JHCPB Construction water reuse targets

Category	Requirement / Target	Performance PTD
Percentage of non-potable water demand which is sourced from non-potable water sources during construction.	15%	86.00%
Percentage of water (rainwater, stormwater, wastewater, groundwater, tunnel inflow water) generated/collected during construction which is reused, recycled or reclaimed.	15%	10.33%

As part of the planning approval requirements (CoA E198) a *Construction Water Reuse Strategy* (CWRS) (RIC-JHC-PLN-00-PL-430-002) was developed which sets out the options for the reuse of collected rainwater and groundwater during construction on the Project. The strategy identified and assessed opportunities to reduce the consumption of water and increase the level of water reused during construction. The CWRS was submitted to DPIE prior to the commencement of tunnelling and has been approved. For WHT STW a separate CWRS has been developed STW-JHC-STG-00-EN-002-000002 to fulfil the requirements of CoA E127, this plan continues to stipulate the water re-use opportunities and plan for the tunnelling scope for WHT STW.

The project performed an assessment within the reporting period to identify the total non-potable water demand for the project, this was due to incorrect tracking prior. Using the Sustainability Water Model the project was able to identify what avenues for water re-use are reasonable and feasible based on the scope of works. This calculation identified that the project is using 86% of its forecasted non-potable demand.

Water continues to be re-used at RIC during construction for:

- Surface water is currently captured and transferred into sediment holding tanks (e.g. tanks located at Western Harbour Tunnel, M4 and M5 C&C) where it is transferred to WTPs for treatment and utilised for earth compaction, wheel wash and belt wash, and dust suppression.
- Rainwater is being captured at Rozelle Rail Yards (RRY), City West Link (CWL), Iron Cove Link (ICL) surface sites and Site C. Tank capacity ranges from 5-10kL across sites. The rainwater tanks at Site C were removed during demolition of the acoustic sheds at these locations in late 2022.
- Surface water was being captured at the Site C WTP for discharge/water cart use, this was demobilised in early 2023 with the demobilisation of the site offices at Gordon Street. This was replaced by the a temporary WTP at the future Maintenance and Operations Centre (MOC) and WHT STW plant. Options for reuse are being developed for the temporary plant at MOC as access becomes available.
- Utilisation of polymer as well as remote-controlled sprinkler for dust suppression (at space constrained sites).

Water re-use is being set up for WHT STW

- Tunnel water is captured in treated water tanks at the WHT C&C WTP, once treated it is discharged or re-used.
  - Treated tunnel water is being re-used for water carts, wheel washes, misters and road wetting hoses.
- Rain water tanks are being set up towards the end of the reporting period to be established for domestic use in the site office.

Total use for the period is obtained for all water meters and reported in the quarterly sustainability dashboards. As detailed in Figure 6, the Project has consumed 965,144 kL of potable water to date. This is approximately 94% of the 1,031,972 kL total potable water consumption predicted for the Project during delivery in the Project's water model. The water model has been updated to include both RIC and WHT STW into account providing a gross water consumption across the entire project.

RRY finished using Road headers for tunnelling in May22 which showed a drop in potable usage, tunnelling resumed in July22 with the commencement of WHT STW.

Figure 6: Monthly volumes of potable and non-potable water used on the Project PTD

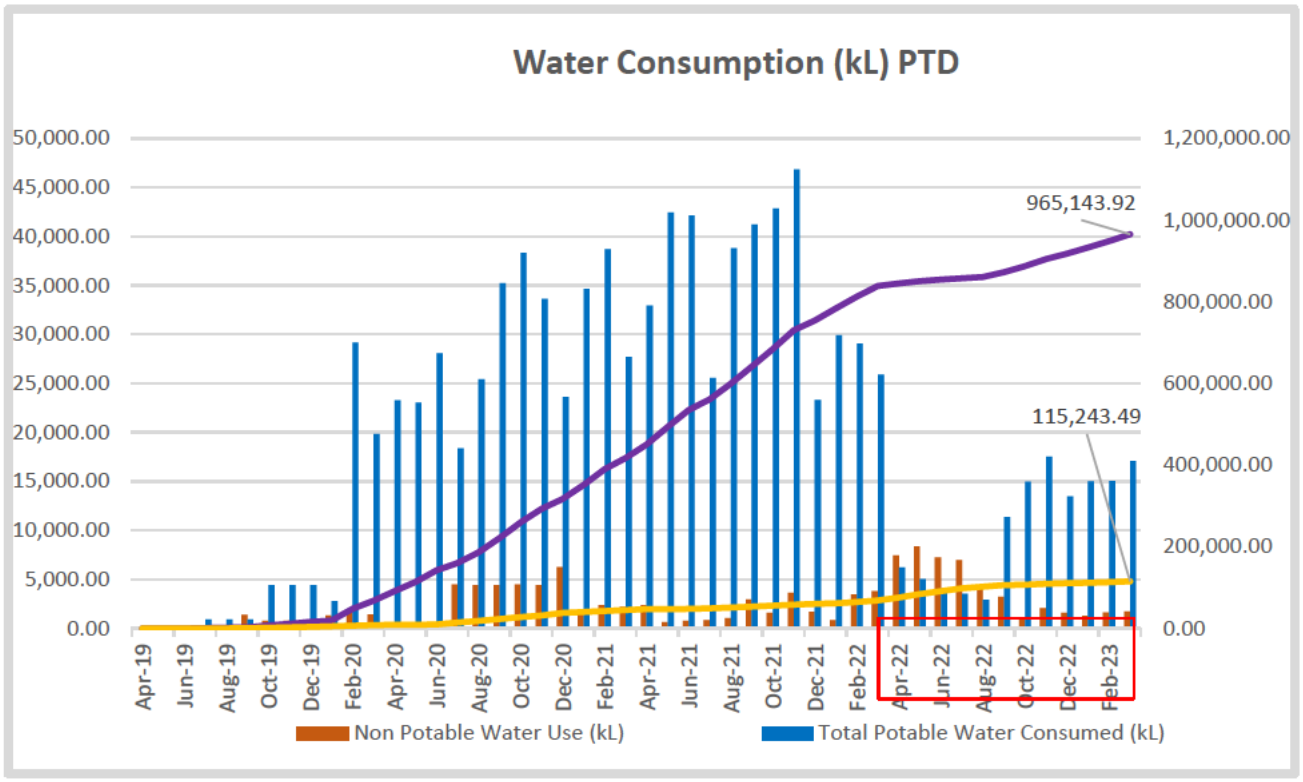


Figure 7. Non-Potable Water Replacement Performance 2022-2023

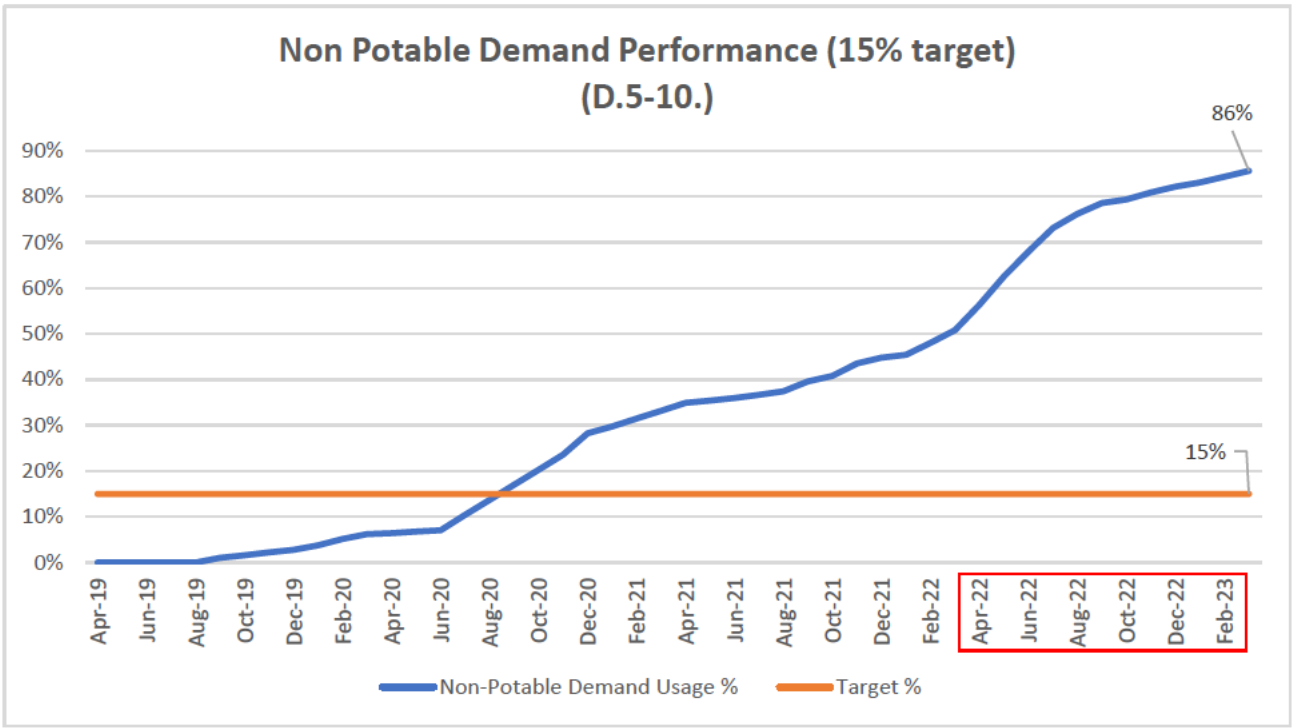
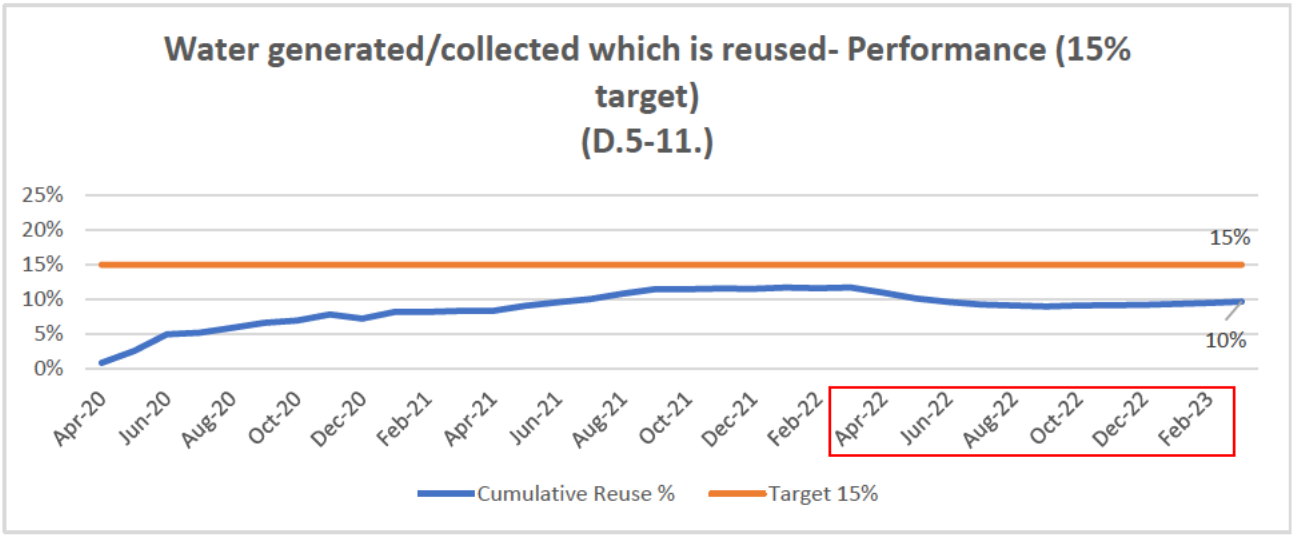


Figure 8. Water Generated/Collected which is Reused-Performance 2022-2023



4.3 Materials

The Project will use a significant amount of material during construction, including steel, concrete, quarry products and asphalt. These materials contribute considerably to the Project's carbon footprint. The SWTC targets, detailed in Table 10, are directed at reducing the amount of materials used and/or selecting materials with lower embodied environmental impacts.

Table 10. JHCPB Material targets

Category	Requirement / Target	Performance PTD
Percentage of cement replacement material, measured by mass, used in concrete during the construction stage.	5%	37%
Percentage of recycled material used in road base and sub-base during the construction stage.	10%	62%
The Project Company must source 100% of all timber products used in the Project from either reused/recycled timber or from sustainably managed forests that have obtained Forest Management Certification (FMC).	100%	93%

The Sustainability Plan identified several opportunities to optimise resource efficiency (materials, energy, water, land), minimise construction materials or replace traditional materials with low embodied environmental impact materials. Table 11 lists some of these opportunities, as well as additional opportunities identified during the detailed design phase.

Table 11. Construction key material sustainability opportunities

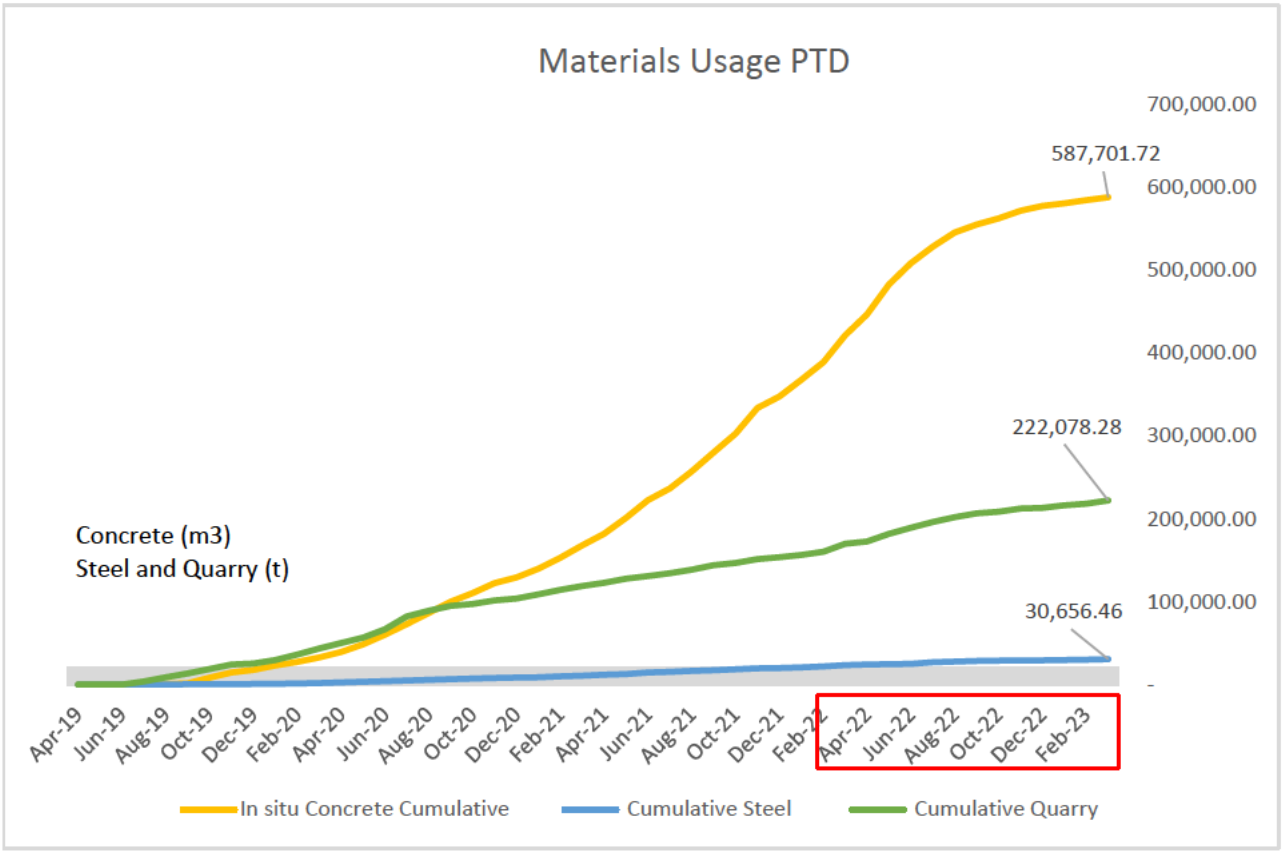
Opportunity	Description	Implementation Status- Construction
Use of geopolymer concrete (GPC)	Utilisation of a GPC concrete mix containing no cement and consisting of fly ash, slag and alkali activator in footpaths, pram ramps, medians, drainage, and other non-structural concrete elements.	Geopolymer was specified as an opportunity in design packages for Surface Works. JHCPB received approval for the implementation of a GPC mix + glass sand in non-structural permanent works. The second trial has taken place on Brenan St at CWL, this pour of 2.5m3 incorporated the lessons learnt from the 1st pour. UNSW has taken the lessons learnt from this to further refine its mix.

Opportunity	Description	Implementation Status- Construction
Use of recycled crushed glass as aggregate in concrete elements	Use of crushed glass as aggregate in concrete blends for footpaths, pram ramps, medians and other non-structural concrete elements	Implemented in temporary and permanent structural and non-structural works. ~150 tonnes of glass waste has been diverted from landfill to date.
Use of recycled crushed glass as aggregate in other elements	Use of crushed glass sand as bedding and drainage material – flowable fill- Tunnel Barriers / Drainage trenches	Client approval to trial crushed glass sand in flowable fill was approved, and a trial undertaken in April 2021. However, the price of glass sand has become cost prohibitive, and as such the client did not elect to pursue wider application of this opportunity.
Use of Emesh	Utilisation of Emesh consisting of 100% recycled polypropylene plastic fibres in concrete in lieu of steel mesh in footpaths, pram ramps, medians, drainage, and other non-structural concrete elements.	Implemented in temporary and permanent non-structural works. To date, 4560kg of emesh has been used, constituting a significant amount of plastic removed from the waste stream.
Inclusion of permanent design elements in interim/temporary design	Design of temporary works for pavements and curbs is done as close as possible to permanent works to reduce rework for permanent works	The Project is considering the retention of the following temporary works: • Blinding concrete • Footings for support of temporary works (e.g. concrete piles) • Destressed rockbolts and ground anchors to shore up batters and rock faces for cut & covers • Temporary services and utility diversions • Buried formwork • Sheet piling
Bespoke Low Carbon Concrete (LCC)	Low Carbon Concrete Mix Design (70% cement replacement, 8% glass sand replacement, 4-6kg/m3 of emesh)	Implemented in temporary and non-structural permanent works. Envisia + Glass sand approved for permanent non-structural works (footpaths, SUP, pram ramps, medians and roof protection slabs). Over 3,445 m3 of bespoke LCC used to date. During the reporting period, the LCC was used for the following applications: • Roadside Kerbs • Footpaths • In-Situ F-Type Barriers

During the review period JHCPB used 2,957m3 of concrete, 7,658 tonnes of steel and 50,736.19 tonnes of quarry materials in construction. Project to date values are provided in Figure 9.

The Project has used ~ 3,460m3 of low carbon concrete and achieved over 37% cement replacement across the Project. The Project has also achieved 62% recycled material in road base/subbase usage while procuring 93% of total timber from sustainable sources.

Figure 9. Materials Usage PTD



4.4 Waste

Waste management, in the context of sustainability, includes the generation and movement of general solid and putrescible waste, co-mingled recycling, spoil, building and demolition, commercial, office and industrial wastes. Table 12 outlines the performance against the SWTC targets relating to the management of waste on site.

Table 12. JHCPB Waste targets

Category	Requirement / Target	Performance PTD
Percentage of usable spoil (uncontaminated surplus excavated material) reused/recycled.	80%	98.2%
Percentage of construction and demolition waste (uncontaminated material excluding spoil) reused/recycled.	80%	93.5%

The landfill diversion rates for spoil up until March 2023 are shown in Table 13 against the corresponding target. Table 14 displays the progress for all other waste streams. At the end of the reporting period, a total of 9,508,932 tonnes of spoil had been excavated.

Table 13. Landfill diversion rates for spoil

Source	Tonnage	Rate	Target	Comment
Total Spoil Generated	9,508,932	N/A	N/A	All spoil from the site including contaminated/special waste
Contaminated Spoil	222,063	N/A	N/A	Spoil contaminated with asbestos or any other contamination in which disposal is regulated

Source	Tonnage	Rate	Target	Comment
Spoil diverted from Landfill	9,115,290	98.2%	80%	Percentage of spoil diverted reused onsite and off-site
Spoil sent to Landfill	216,421	1.8%	N/A	Spoil classified as general solid waste (GSW)

Figure 10 illustrates the rates of beneficial spoil reuse during the review period. The reduction in monthly spoil excavation is consistent with the WHT STW scope of works continuing with 6 road headers operating, this picked up as the tunnelling conducted under RIC wrapped up.

Figure 10. Spoil reuse on the Project PTD

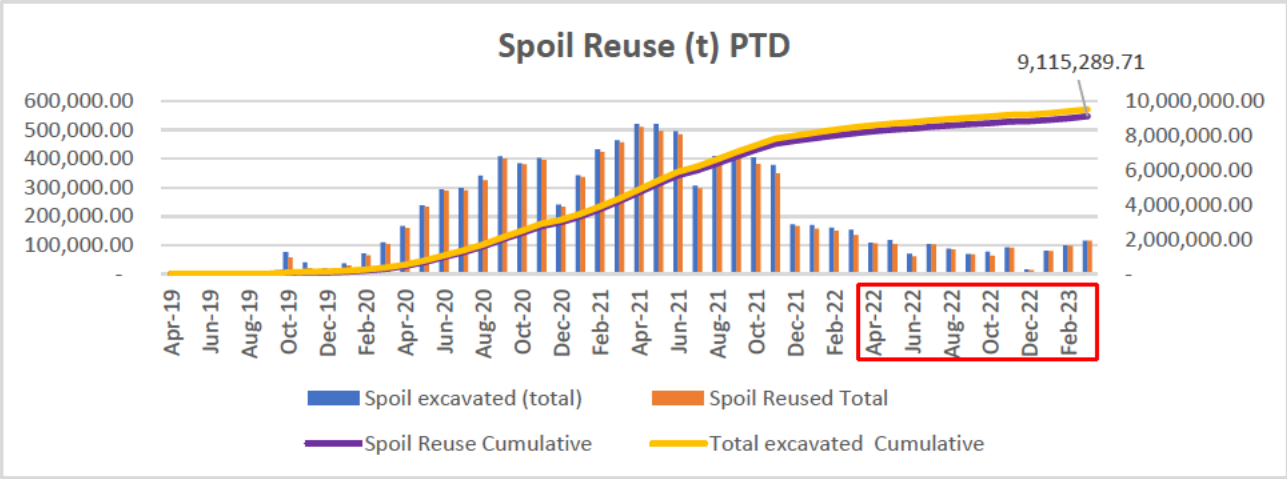


Figure 11. Spoil Diversion PTD

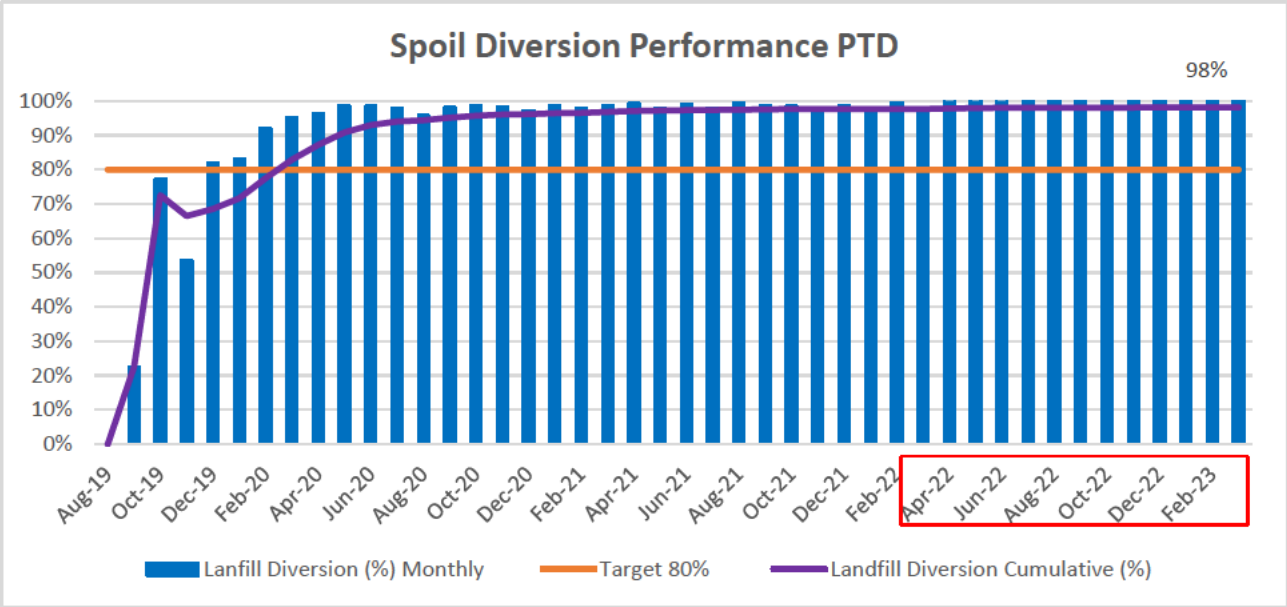
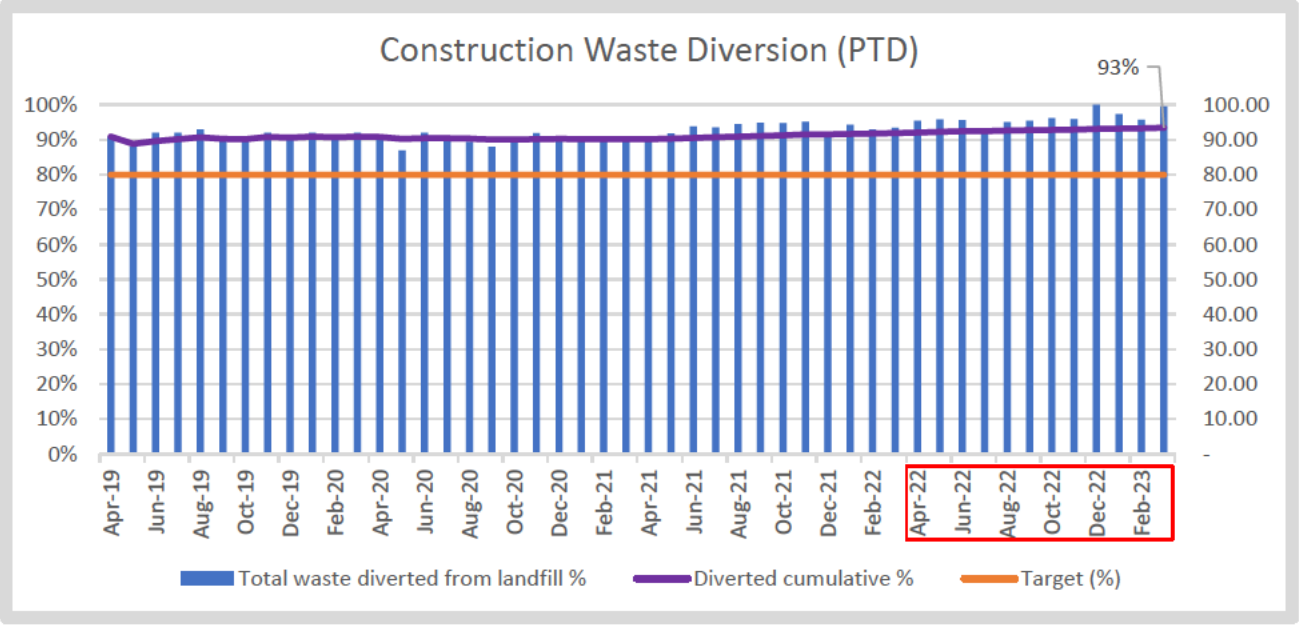


Table 14. Landfill diversion rates for all other waste – Project to date

Source	M3 PTD	Rate	Target	Comment
Total Waste generated	85,832.71	N/A	N/A	33,100.20 m3 of construction and office waste generated during the review period
Construction Waste Generated	79,096.00	N/A	N/A	Includes building and demolition (B&D) waste. 29,476.42 m3 generated during the review period.
Construction waste to Landfill	5,465.41	7%	N/A	Includes B&D waste. 1,378.14 m3 generated during the review period.
Construction waste diverted from Landfill	73,921.74	93%	80%	Currently exceeding the target. 28,325.82 m3 diverted during the review period.
Office waste generated	6,736.71	N/A	N/A	Recycled paper, cardboard commingled and general office waste only. 3,623.78 m3 generated during the review period.
Office waste to Landfill	4,544.26	67%	N/A	Project to date office waste diversion has stayed consistent with last year's metric, although still below the targeted 40% mitigations are in place to review and improve this factor.
Office waste diverted from Landfill	2,192.45	33%	40%-60%	Minimum 40% diversion requirement specified in Was-2 L2 (target level). A waste strategy has been implemented to help improve performance against this target.

The landfill diversion rates for construction waste are illustrated in Figure 12. JHCPB is currently exceeding the 80% diversion target for construction and demolition waste. The subcontractor's performance is tracked monthly. Annual waste to destination audits for construction waste are also conducted during construction.

Figure 12. Landfill diversion rates for construction waste



At the date of the report, office waste diversion was not meeting the target. Figure 13 reflects performance against IS V1.2 Was-2- Level 2 (40%- 60%). However, a number of measures to improve office waste diversion have been implemented in the review period, including:

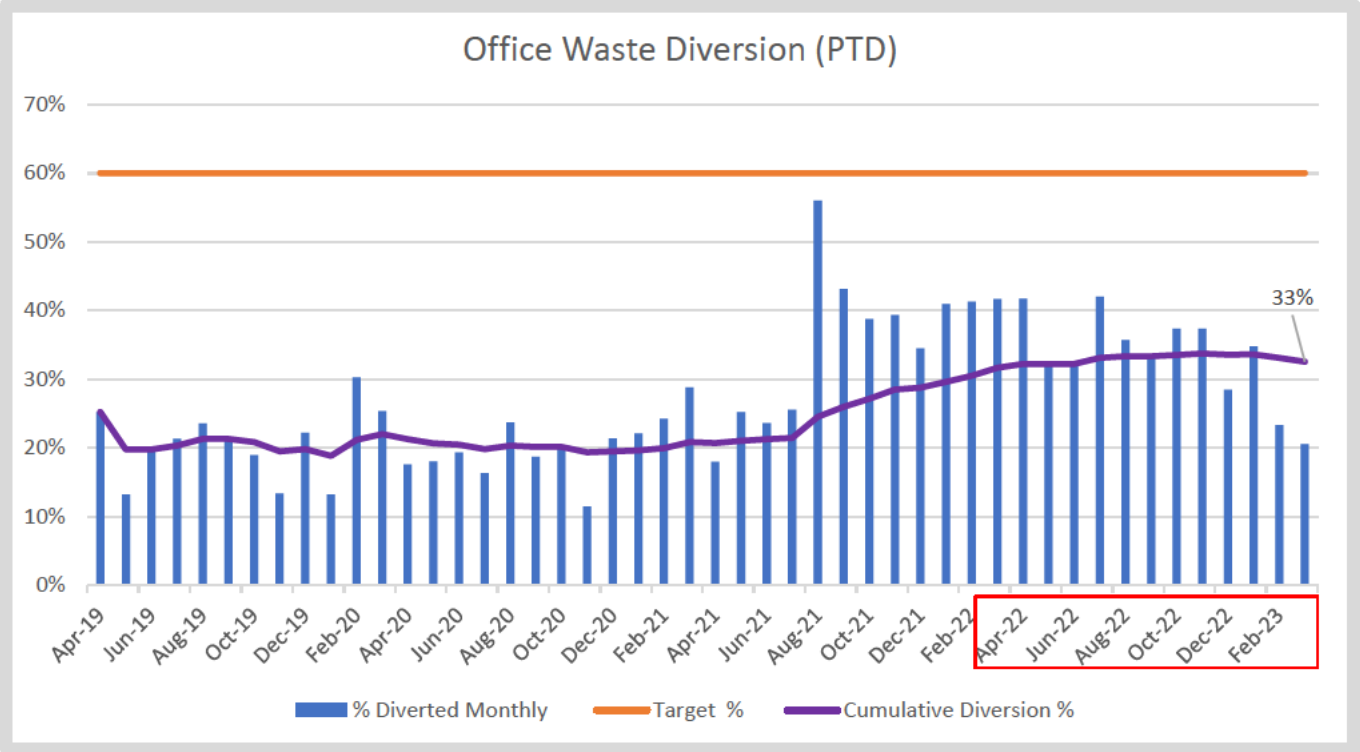
- Setting up sites with co-mingled and paper/cardboard bins additional to general waste, this has helped provide clear waste segregation for people to follow. This was set up in the following locations:

- The offices located on top of the M5 C&C supporting the tunnel fit out team – added grasshopper to this scope of recycling to boost diversion rates.
- JHCPB Training Academy in Homebush
- Western Harbour Tunnel – Southern Tunnelling Works offices

- PPE recycling was conducted for the demobilisation of the Gordon Street Megaplex. The streams that were collected for this was hard hats, steel capped work boots and Hi-Vis clothing. In total 300kg was diverted from landfill.
- Mask recycling has been implemented outside the C&C of the WHT STW and M5 offices, this was implemented due to disposable masks being the largest waste stream of PPE on the project. This has had good success with low levels of contamination and compliance from the team.

There has been a decrease in office waste diversion in the last quarter (Q1 2023) due to the megaplex being demobilised, sites were in the transition period of being set up and fitted out.

Figure 13. Office Waste Diversion



4.5 Workforce Training and Participation

SWTC D.5 identifies 35 metrics for the measurement of workforce training and participation.

Table 15 shows progress report to Q1 2023 in relation to SWTC D.5 requirements for sustainability reporting.

Table 15. Workforce training and participation progress

SWTC Ref.	WCX – 3B Rozelle Interchange and WHT Enabling Works	PTD (Q1 2023)
a.	Residents of Greater Western Sydney who are employed on the Project	10284
b.	Residents of Greater Western Sydney who are employed as an apprentice on the Project	162
c.	Residents of Greater Western Sydney who are employed as a trainee on the Project	65
d.	Residents of Greater Western Sydney who are employed on the Project and were unemployed for greater than 26 weeks prior to commencing employment on the Project	517
e.	Residents of Greater Western Sydney who are employed on the Project and were unemployed for greater than 13 weeks prior to commencing employment on the Project (NB: this stat is for between 13 weeks and 26 weeks)	65
f.	Residents of the local community who are employed on the Project	332
g.	Residents of the local community who are employed as an apprentice on the Project	3
h.	Residents of the local community who are employed as a trainee on the Project	5
i.	Residents of the local community who are employed on the Project and were unemployed for greater than 26 weeks prior to commencing employment on the Project	60
j.	Residents of the local community who are employed on the Project and were unemployed for greater than 13 weeks prior to commencing employment on the Project (NB: this stat is for between 13 weeks and 26 weeks)	7
k.	Young people aged 16 to 25 years who are employed on the Project	2989
l.	Young people aged 16 to 25 years who are employed on the Project and were not in employment, education or training prior to commencing employment on the Project	42
m.	Young people aged 16 to 25 years who are employed as an apprentice on the Project	172
n.	Young people aged 16 to 25 years who are employed as an apprentice on the Project and were not in employment, education or training prior to commencing employment on the Project	351
o.	Aboriginal and Torres Strait Islanders who are employed on the Project	821
p.	Aboriginal and Torres Strait Islanders who are employed as an apprentice on the Project	14
q.	Aboriginal and Torres Strait Islanders who are employed as a trainee on the Project	5
r.	Aboriginal and Torres Strait Islanders who are employed on the Project and were unemployed for greater than 26 weeks prior to commencing employment on the Project	27
s.	Aboriginal and Torres Strait Islanders who are employed on the Project and were unemployed for greater than 13 weeks prior to commencing employment on the Project (NB: this stat is for between 13 weeks and 26 weeks)	3
t.	People with a disability requiring workplace adjustment who are employed on the Project	85
u.	People with a disability requiring workplace adjustment who are employed as an apprentice on the Project	0
v.	People with a disability requiring workplace adjustment who are employed as a trainee on the Project	3
w.	People with a disability requiring workplace adjustment who are employed on the Project and were unemployed for greater than 26 weeks prior to commencing employment on the Project	13
x.	People with a disability requiring workplace adjustment who are employed on the Project and were unemployed for greater than 13 weeks prior to commencing employment on the Project (NB: this stat is for between 13 weeks and 26 weeks)	1
y.	Women in non-traditional trades/professions who are employed on the Project	923
z.	Women in non-traditional trades/professions who are employed as an apprentice on the Project	14
aa.	Women in non-traditional trades/professions who are employed as a trainee on the Project	11
bb.	Women in non-traditional trades/professions who are employed on the Project and were unemployed for greater than 26 weeks prior to commencing employment on the Project	27
cc.	Women in non-traditional trades/professions who are employed on the Project and were unemployed for greater than 13 weeks prior to commencing employment on the Project	30
dd.	Women in senior leadership and management roles who are employed on the Project	15
ee.	Undergraduates who are employed on the Project	59
ff.	Jobseeker work placement positions (Age 16+) who are employed on the Project	0
gg.	Work experience placements (Age 14+) who are employed on the Project	0

The Project has invested significantly in training and upskilling its workers. Over 18,716 people have been inducted to the Project, and 177,000 training hours delivered. During the reporting period, 12,947 hours of accredited training were delivered.

4.6 Sustainable Procurement

Seven requirements are listed in Appendix D of the SWTC as related to sustainable procurement on the Project. These requirements are listed in Table 16.

Table 16. SWTC Sustainable procurement requirements

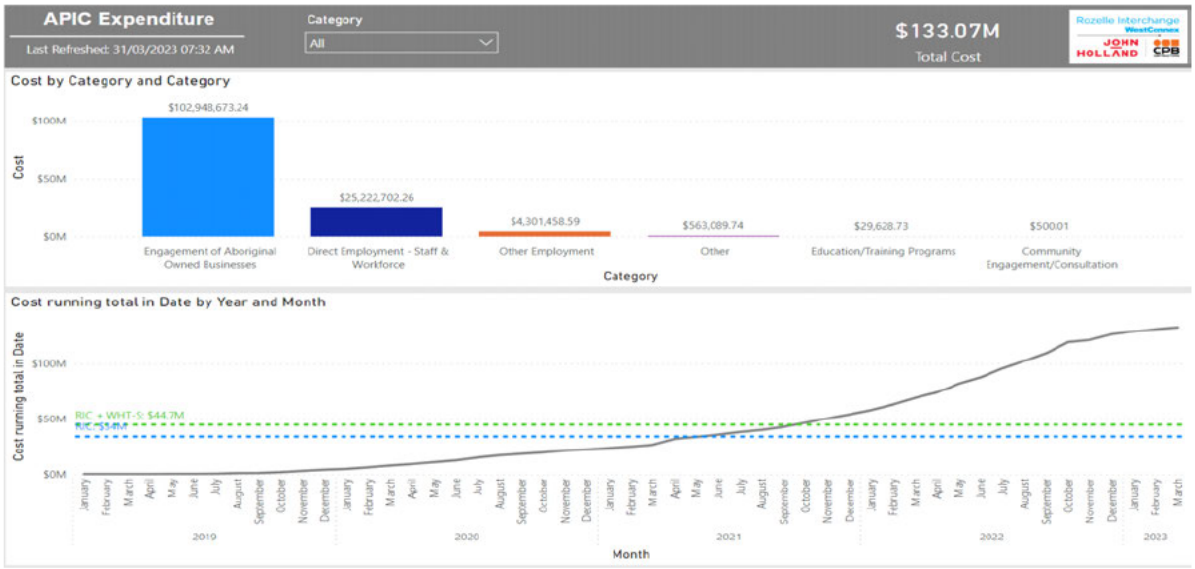
SWTC Ref.	SWTC D5 Requirement	Progress to Q2 2023
a.	The Project Company must identify and implement sustainable procurement initiatives to enhance the whole-of-life environmental, social and economic sustainability outcomes of the Project through the supply chain (including subcontractors).	Project teams continue collaborating with Concrete Suppliers to pursue trials of: - Low carbon concrete - Recycled materials in lieu of virgin materials - Geopolymer research project with UNSW is ongoing. The reverse osmosis system used to irrigate the parklands has been approved for use by the client. This will be implemented and setup towards the back end of the project. The project has invested heavily in local procurement to boost the local economy, with 12% of contracts awarded locally (Inner West Council and City of Sydney). Over $68,000 was spent with local businesses and the Harding Miller Foundation (Balmain-based registered charity) in Christmas 2022
b.	The Project Company must develop, implement and maintain a robust system to inform subcontractors of the sustainability procurement requirements.	The Project tender evaluation, interview and analysis documentation was updated and approved in 2019 to include non-cost considerations including,

SWTC Ref.	SWTC D5 Requirement	Progress to Q2 2023
c.	The Project Company must include environmental, social and economic criteria in the evaluation and selection of subcontractors.	previous experience and reputation, health and safety, indigenous participation, programme, and environment and sustainability. Assessment continues to be conducted via a Pre-qualification questionnaire. Responses are then reviewed and evaluated by the relevant discipline leads from Safety, Environment and Quality, to generate a score from the multi-disciplinary review. Non-financial considerations make up 25% of the final tender evaluation (75% cost).
d.	The Project Company must prioritise procurement from local suppliers and businesses where practical.	The Project has executed 841 Contracts in total: • Australian companies= 932 • New South Wales companies= 787 • Greater Western Sydney= 351 • Local Companies (CoS and IWC) = 120
e.	The Project Company must demonstrate how sustainable workforce initiatives and requirements are considered in procurement.	Procurement processes continue identification Aboriginal business in every request for tender. Justification must be provided if a potential Aboriginal Supplier cannot be identified to tender on the package. In addition, Section F of the tender questionnaire refers specifically to sustainability performance, and these responses are factored into the non-cost evaluation score allocated to tenderers. The Project has targeted level 3 for Pro-3, which refers specifically to sustainability evaluation in procurement, and is on track to meeting this target.
f.	The Project Company must demonstrate to RMS' representative how the sustainable procurement requirements listed in section 2.7 a) to e) are being met during the period from the date of the Deed until Date of Completion.	Sustainable procurement is detailed as part of the Quarterly Sustainability Reporting process.
g.	The Project Company must demonstrate compliance with the NSW Government's Aboriginal Participation in Construction Policy, August 2016.	25 Indigenous companies have been engaged Project to date, refer Table 18 below. While procurement is substantially complete on the Project, JHCPB continues to investigate opportunities to enhance its APiC spend.

Table 17. APIC businesses engaged on the Project PTD

Business Name	Products/Service
Alpha Sport & Apparel	Corporate PPE
ARA Indigenous Services Pty Ltd	M&E Deluge equipment
Australian Indigenous Electrical Wholesalers Pty Ltd	Electrical Equipment
Bluewater Group (Australia) Pty Ltd	Supply on stainless steel
Borger Crane Hire Rigging Services Pty Ltd	Crane hire
Brolton Group Pty Ltd	Steel stairs, fire pump room, cable risers & stair access structures
Danielle Sullivan	Artist
Fresh Start Australia Pty Ltd	Waste services
Goanna Services	Recruitment support and workplace readiness program
GWS Engineering & Construction Pty Ltd	Minor Steelwork
Inception Strategies Pty Ltd	Videographer
Integrity Health & Safety Pty Ltd	Training
Kallico Catering	Catering
Koori Kulcha Aboriginal Corporation	Catering
Luke Penrith Arts and Design	Supply of Indigenous PPE
Metropolitan Local Aboriginal Land Council	Welcome to Country
Nogard Australia Pty Ltd	PPE/Janitorial Supplies
Pacific Facility Services Pty Ltd	Site Office Cleaning
Sawtell Consulting Pty Ltd TA Muru Survey TA UAV	Surface Works Surveying
Site Pacific Group Pty Ltd	Scaffolding works
Spirit Digital Pty Ltd	Printing Services
Weilwun Pty Ltd	Landscaping and Building supplies
Willard Pty Ltd TA Cultural Choice Office Supplies	Stationary/Office Supplies
Yalagan Group Pty Ltd	Recruitment
Yamari Ochre Signs Pty Ltd	Signage

Figure 14. Aboriginal Business Engagement - PTD March 2023



4.7 Infrastructure Sustainability Rating (IS Rating)

JHCPB is required to achieve an Infrastructure Sustainability Council (ISC) IS rating of 'Excellent' in both the Design and As-Built phase. At the commencement of the Project, JHCPB undertook an interim assessment of the 15 categories of the IS rating tool and committed to an aspirational target of 86.8 points ('Leading' rating). The project received its Design rating score of 88.8 late 2021, the As-Built submission is forecasted to receive 97.2 if all credits achieve targeted score.

The project As-Built tracking per credit and design scores are stipulated in Table 18. This highlights the targeted level for each credit but also the status of each credit and risks associated.

The Projects IS Rating has had an addition of scope since the last review, this scope addition is incorporating the variation Western Harbour Tunnel – Southern Tunnelling Works. This variation is detailed in Section 1 and will be incorporated into Rozelle Interchanges IS rating (J189) with additional modelling and monitoring added to cover the scope. The reason this was not sought as a separate rating was due to a significant amount of carryover from RIC regarding design, team and management plans. This leaves the practical completion of the project in March 2025 at the end of this variation. The project is currently proposing to have a staggered verification to be able to address all data from RIC before most surface work staff have departed, this is currently pending with ISC.

Internal progress reviews of IS rating credits is regularly undertaken to identify gaps in the evidence and areas that can be improved. Unless otherwise specified in 18 below, the Project is targeting the same level in As Built for each credit as during Design. Additional credits have been added under the As-Built rating, including Was-2, Pro-3, Pro-4, Mat-2, Her-2 and Urb-2. The Project is targeting full verification of Level 3 for these credits, with the exception of Was-2 and Urb-2, where Level 2 is targeted.

Table 18. IS Rating Design Score Comments and As Built Targets

Credit		Design R2 Level Obtained	Design R2 Points Obtained	Level Targeted for AB R1	Score Targeted for AB R1	Comments
Man-1	Sustainability leadership and commitment	3	0.86	3	0.77	Fully verified in Design. On track to achieve full verification in AB.
Man-2	Risk and opportunity management	1	0.43	2	0.77	Partially verified in Design. JHCPB has added economic risks and opportunities into project risk register to assist with AB submission.
Man-3	Organisational structure, roles and responsibilities	2	0.86	2	0.77	Fully verified in Design. On track to achieve full verification in AB.
Man-4	Inspection and auditing	2	0.86	2	0.77	Fully verified in Design. On track to achieve full verification in AB.
Man-5	Reporting and review	3	0.86	3	0.77	Fully verified in Design. On track to achieve full verification in AB. Evidence of stakeholder assessments to be provided in AB.

Credit		Design R2 Level Obtained	Design R2 Points Obtained	Level Targeted for AB R1	Score Targeted for AB R1	Comments
Man-6	Knowledge sharing	3	1.96	3	1.73	Fully verified in Design. On track to achieve full verification in AB. Additional evidence of knowledge shares have been provided
Man-7	Decision-making	0	0.00	2	1.67	Not verified in Design. This is an exceedingly difficult credit to achieve given onerous evidentiary requirements relating to the assessment of significant decisions. JHCPB has identified that level 3 is not being targeting, level 2 is being targeted for AB.
Pro-1	Commitment to sustainable procurement	3	1.08	3	0.96	Fully verified in Design. On track to achieve full verification in AB.
Pro-2	Identification of suppliers	2	0.72	3	0.96	Partially verified in Design. Additional examples on pre-contract engagement with suppliers to be provided in AB. JHCPB has developed early contractor engagement with suppliers to satisfy the credit requirements for AB.
Pro-3	Supplier evaluation and contract award	As-Built credit only	As-Built credit only	3	0.96	Targeting Level 3 in AB. Currently collating evidence and on track to achieve target.
Pro-4	Managing supplier performance	As-Built credit only	As-Built credit only	3	0.96	Targeting Level 3 in AB. Currently collating evidence and on track to achieve target. JHCPB is regularly monitoring performance of key suppliers.
Cli-1	Climate change risk assessment	2	2.88	2	2.57	Partially verified in Design. Lesson learned: Local council participation in climate change risk assessments is required on state-significant projects to achieve Level 3.

Credit		Design R2 Level Obtained	Design R2 Points Obtained	Level Targeted for AB R1	Score Targeted for AB R1	Comments
Cli-2	Adaptation options	3	4.32	3	3.86	Fully verified in Design. On track to achieve full verification in AB. JHCPB is collating evidence of implementation of adaptations for AB.
Ene-1	Energy and carbon monitoring and reduction	3	11.67	3	10.41	Fully verified in Design. On track to achieve full verification in AB. JHCPB is collating evidence of implementation of reductions for AB. Modelling for the additional scope of WHT has begun with assistance of the plant team.
Ene-2	Renewable energy	2	1.29	2	1.16	Fully verified in Design. On track to achieve full verification in AB.
Wat-1	Water use monitoring and reduction	1	1.94	3	5.20	Partially verified in Design. Base Case has been updated to amend wording and been approved by ISC, the Project is on track to achieve full verification in AB. Modelling for the additional scope of WHT has begun with assistance of the plant team.
Wat-2	Replace potable water	0.7	0.79	0.96	1.93	Partially verified in Design. Project is calculating final non-potable use to meet credit requirements.
Mat-1	Materials footprint measurement and reduction	1.44	3.73	2	4.63	Fully verified in Design. On track to achieve full verification in AB. JHCPB is continuing to track material reductions. Modelling for the additional scope of WHT has begun with

Credit		Design R2 Level Obtained	Design R2 Points Obtained	Level Targeted for AB R1	Score Targeted for AB R1	Comments
						assistance of the site engineers.
Mat-2	Environmentally labelled products and supply chains	As-Built credit only	As-Built credit only	3	1.16	Targeting Level 3 in AB. Currently collating evidence and on track to achieve target. Best method to calculate total material spend on the Project is still to be determined in collaboration with the commercial team.
Dis-1	Receiving water quality	1	1.03	3	2.75	Partially verified in Design. Project has received back a response from the IS council regarding peak stormwater flow. A discharge impact assessment is being curated The Project is still targeting Level 3 in AB.
Dis-2	Noise	3	3.08	3	2.75	Fully verified in Design. On track to achieve full verification in AB.
Dis-3	Vibration	3	3.08	3	2.75	Fully verified in Design. On track to achieve full verification in AB. Examples of responses to community complaints to be provided in AB.
Dis-4	Air quality	3	4.11	2	2.44	Fully verified in Design. On track to achieve full verification in AB. Due to the strict requirements of level 3 JHCPB does not expect to not obtain but will submit level 3 regardless.
Dis-5	Light pollution	1	1.30	1	1.16	Fully verified in Design. On track to achieve full verification in AB.
Lan-1	Previous land use	3	2.16	3	0.64	Fully verified in Design. On track to achieve full verification in AB.

Credit		Design R2 Level Obtained	Design R2 Points Obtained	Level Targeted for AB R1	Score Targeted for AB R1	Comments
Lan-2	Conservation of onsite resources	Scoped Out.				
Lan-3	Contamination and remediation	3	3.46	3	3.08	Fully verified in Design. On track to achieve full verification in AB.
Lan-4	Flooding design	0	0	2	1.73	Not verified in Design. JHCPB has developed additional data that highlight areas of afflux >0.1m are confined to public areas only. JHCPB has submitted a CIR to further detail the level of climate modelling that is necessary for the project and what is available. JHCPB will continue to target Level 2 in AB.
Was-1	Waste management	2	1.73	2	1.54	Fully verified in Design. On track to achieve full verification in AB.
Was-2	Diversion from landfill	As-Built credit only	As-Built credit only	1	0.90	On-track to achieve construction waste targets in AB. Additional measures to achieve Level 2 office waste diversion in AB are being pursued, including recycling fit out for additional offices and PPE recycling onsite.
Was-3	Deconstruction /Disassembly/ Adaptability	Scoped out.				
Eco-1	Ecological value	2	2.16	2	1.93	Level 2 verified in Design based on increase in ecology as a result of project. On track to achieve verification in AB.
Eco-2	Habitat connectivity	Scoped Out				
Hea-1	Community health and well-being	3	2.16	3	1.93	Fully verified in Design. On track to achieve full verification in AB.

Credit		Design R2 Level Obtained	Design R2 Points Obtained	Level Targeted for AB R1	Score Targeted for AB R1	Comments
Hea-2	Crime prevention	2	2.16	2	1.93	Fully verified in Design. On track to achieve full verification in AB.
Her-1	Heritage assessment and management	3	4.32	3	1.93	Fully verified in Design. On track to achieve full verification in AB.
Her-2	Monitoring and management of heritage	As-Built credit only	As-Built credit only	2	1.93	Targeting Level 3 in AB. Currently collating evidence and on track to achieve target.
Sta-1	Stakeholder engagement strategy	3	2.16	3	1.93	Fully verified in Design. On track to achieve full verification in AB. JHCPB to investigate avenues of consultation available for both RIC and WHT strategy pending approval.
Sta-2	Level of engagement	3	2.16	3	1.93	Fully verified in Design. On track to achieve full verification in AB.
Sta-3	Effective communication	2	2.16	3	1.93	Fully verified in Design. On track to achieve full verification in AB.
Sta-4	Addressing community concerns	2	2.16	3	1.93	Fully verified in Design. On track to achieve full verification in AB. JHCPB has amended audit format to satisfy IS requirements for this credit.
Urb-1	Urban design	3	5.19	3	4.63	Fully verified in Design. On track to achieve full verification in AB.
Urb-2	Implementation	As-Built credit only	As-Built credit only	1	0.58	Level 1 targeted in AB, and JHCPB is on track to achieve this. A SQP Urban and Landscape auditor being sought, difficulty has been had in finding SQP available within audit budget.
Inn-1	Innovation	10	10	10	10	3 Australian firsts achieved in design – geopolymer concrete, low carbon concrete and

Credit		Design R2 Level Obtained	Design R2 Points Obtained	Level Targeted for AB R1	Score Targeted for AB R1	Comments
						fully electric shotcrete rig. Dry-Flo was awarded a world first in design but was no pursued so will have to find alternatives to replace this innovation. Alternatives being investigated: - Fredon - Side Wall Ladder Installation Bespoke Truck. - Dust suppression techniques for reduce airborne silica. - Reverse Osmosis System using tunnel water for park irrigation.
Total		**88.8 Received in Design**		**97.2 if all points targeted received for As Built**		

5 Recommendations

This annual sustainability review has identified several actions needed to ensure that JHCPB meet the obligations under the contract and achieve the 'Leading' IS rating score being targeted. Other recommendations relate to areas where the Project can enhance its performance outside contractual or IS frameworks. These recommendations are listed in Table 19. These are initial recommendations are for discussion as part of the management process and will be finalised following discussions with management and project teams.

Table 19. Suggested recommendations for 2023-2024 period

	Recommendation	Comment
1.	Finalise a system for calculating total material spend on the Project	The Project's approach to the Mat-2 credit requires a calculation of total material spend on the Project. Recommend discussing with the commercial team the best method to export this data from Project systems.
2.	Continue to identify opportunities to increase office waste diversion percentages.	Office waste diversion has been tracking in the right direction. However, the Project should continue to consider methods to increase office waste diversion to ensure achievement of Was-2 Level 2.
3.	Investigate any initiatives that may have not been identified/modelled in design.	Upon finalising model ensure that all initiatives have been exhausted that may have been missed initially, any initiatives that were not modelled should be investigated prior to submission.
4.	Identify supplier to track with SSPMR meetings for WHT scope.	For the continuing scope of WHT STW, a subcontractor needs to be identified to monitor for the duration of these works. Works largely conducted by JHCPB, supplier needs to have sustainability materiality as well as significant scope.
5.	Provide awards for subcontractors based on sustainability performance from supplier meetings.	Based on supplier meetings and reward and recognition, sustainability awards need to be provided to subcontractors for good performance, suggest using existing monitoring methods to capture this.
6.	Review submission timeline regarding WHT STW scope.	Due to a significant portion of project staff leaving at the end of Rozelle's scope. The projects practical completion in March 2025 (WHT including) will be the IS rating AB submission. This poses risk due to comments in between R1 and R2 submission which can be mitigated by early planning.
7.	Conduct review of mask recycling initiative.	Cost up total ongoing price for mask recycling with terracycle (environment, social and economic assessment). This MCA will be used to pitch the initiative to be continued through the rest of the project, this is due to only 10 boxes being procured as a trial for the project.