



Australian Government



**Sydney Metro –
Western Sydney Airport**

Sydney Metro – Western Sydney Airport Submissions Report



Sydney Metro – Western Sydney Airport

Submissions Report

Client: Sydney Metro

ABN: 12354063515

Prepared by

M2A

Level 25, 680 George Street, Sydney NSW 2000
ABN: 60 549 956 366

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Executive summary

Overview

Sydney is expanding and the NSW Government is working hard to deliver an integrated transport system that meets the needs of customers now and in the future. The delivery of Sydney Metro – Western Sydney Airport (the project) is critical to delivering an integrated transport system for the Western Parkland City and is identified in a number of key strategic planning documents including the *Greater Sydney Region Plan* (Greater Sydney Commission, 2018a), *Future Transport 2056* (Transport for NSW, 2018) and the *NSW State Infrastructure Strategy 2018 – 2038* (Infrastructure NSW, 2018).

Sydney Metro is Australia's biggest public transport program. Services started on the Metro North West Line between Rouse Hill and Chatswood in May 2019 on this new stand-alone metro railway system, which is revolutionising the way Greater Sydney travels. Sydney Metro's program of work includes:

- **The Metro North West Line** – Opened in May 2019 with driverless trains running every four minutes in the peak in each direction between Tallawong Station in Rouse Hill and Chatswood
- **Sydney Metro City & Southwest** – A new 30-kilometre metro line extending the new metro network from the end of the Metro North West Line at Chatswood, under Sydney Harbour, through the Sydney CBD and southwest to Bankstown. It is due to open in 2024 with capacity to run a metro train every two minutes each way under the centre of Sydney
- **Sydney Metro West** – A new 24-kilometre metro line that will connect Greater Parramatta with the Sydney CBD. Confirmed stations include Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Sydney CBD. This infrastructure project will double the rail capacity between Greater Parramatta and the Sydney CBD with a travel time target between the two centres of about 20 minutes
- **Sydney Metro – Western Sydney Airport (this project)** – A new metro rail line between St Marys in the north and the Aerotropolis Core precinct in the south (the area to be called Bradfield), via Western Sydney International (Nancy-Bird Walton) Airport (Western Sydney International). The project would provide a connection between the existing Sydney Trains suburban rail network at St Marys and six new metro stations, including two at Western Sydney International and one at the Aerotropolis.

Sydney Metro – Western Sydney Airport benefits

The timing of the project is important as it would inform long-term land use planning and provide certainty to local councils on developments in their area, which can be built around available transport infrastructure.

The new metro railway would be a city-shaping project which would help optimise land use and development, creating precincts and places with a high level of accessibility to jobs and services. A fast, safe and easy metro rail service would deliver better access to more employment opportunities, health and education services and leisure activities across the Western Parkland City and Greater Sydney.

In summary, the project would:

- provide the initial spine of a transport network to service the Western Parkland City, providing a reliable and efficient public transport option for existing and future residents, customers and employees of the Aerotropolis and Western Sydney International and associated businesses in Western Sydney
- support the successful development of Western Sydney International as a nationally significant economic driver
- provide a sustainable, low carbon travel mode that would reduce private vehicle use and road congestion and improve accessibility to air travel for people living in Western Sydney

- unlock economic development and employment generation activity around St Marys, the Aerotropolis and Western Sydney International
- provide opportunities for placemaking at the stations, such as public domain improvements, and act as a catalyst for future development in the station precincts
- provide a structural framework for the development of future transport, education, health and social infrastructure in the region around a mass transit corridor.

Consultation on the Environmental Impact Statement

The Sydney Metro – Western Sydney Airport Environmental Impact Statement was placed on public exhibition by the Department of Planning, Industry and Environment for a period of six weeks from 21 October 2020 to 2 December 2020. During the exhibition period submissions were invited from the community and stakeholders. The receipt of submissions was coordinated and managed by the Department of Planning, Industry and Environment.

The Environmental Impact Statement was released while restrictions were in place in response to the COVID-19 pandemic. With face-to-face engagement restricted, Sydney Metro adapted to the changing circumstances by modifying its engagement approach so the community could still learn about the project, have their questions answered and understand how to have their say while the Environmental Impact Statement was on exhibition.

A range of tools and materials were developed to engage with the community and stakeholders and support exhibition of the Environmental Impact Statement. This included virtual engagement via an interactive portal, an interactive project map, videos from subject matter experts on the project team, a media release, newspaper advertisements, phone calls, project email updates to the project mailing list, letterbox drops, and virtual meetings. Sydney Metro Place Managers engaged with the community, addressing concerns and providing information to support the community's understanding of the project and any relevant impacts.

Key stakeholders (including local government, NSW Government agencies and peak bodies) were briefed via emails, phone calls, virtual meetings and presentations throughout the exhibition period to ensure they received the relevant information to make a submission.

Further information on consultation undertaken is provided in Chapter 2 (Stakeholder and community consultation).

Purpose of this report

This Submissions Report presents responses to submissions received during exhibition of the Environmental Impact Statement. In addition, Chapter 6 (Environmental Impact Statement clarifications) presents clarifications to information presented in the Environmental Impact Statement including an assessment of potential environmental impacts of those clarifications. It also includes details of additional biodiversity, Aboriginal heritage and non-Aboriginal heritage fieldwork carried out since public exhibition of the Environmental Impact Statement.

Overview of submissions received

A total of 40 submissions were received by Department of Planning, Industry and Environment in response to the Environmental Impact Statement during the exhibition period. Of these submissions, nine supported the project, six objected to the project and 25 submissions did not offer a position and were categorised as providing comments.

A total of 25 submissions were received from community members or community and interest groups. These submissions were grouped together as community submissions. The most frequently raised issues by the community included:

- future metro extensions (beyond the scope of the Sydney Metro – Western Sydney Airport project)
- project alternatives and options, including the location of stations
- project description – operation, including the design of metro stations
- property and land use impacts

- transport impacts.

Fifteen submissions were received from NSW Government agencies and key stakeholders. The most frequently raised issues by government agencies and key stakeholders included:

- project alternatives and options future development of station precincts
- the need for ongoing community and stakeholder engagement
- construction and operational transport and traffic impacts
- construction noise impacts to sensitive receivers within the community
- water quality impacts, particularly regarding monitoring
- placemaking strategies and principles
- management of contamination
- property and land use impacts
- biodiversity impacts
- cumulative impacts with other large infrastructure and urban development projects.

Further analysis of submissions received is provided in Chapter 3 (Analysis of submissions). Chapter 4 (Community submissions) and Chapter 5 (NSW Government and key stakeholder submissions) present the issues raised in submissions and corresponding responses. Appendix A (Where to find responses to issues raised in community submissions) includes a table which lists each submission by a unique identification number and provides a cross-reference to the section of this report where the issues that were raised in the submissions are addressed.

Responses to the submissions received in relation to the EPBC Act Draft Environmental Impact Assessments of on-airport and off-airport proposed actions are provided in the *EPBC Act Final Environmental Impact Assessment of on-airport proposed action (EPBC 2019/8541)* (Sydney Metro, 2021a) and the *EPBC Act Final Environmental Impact Assessment of off-airport proposed action (EPBC 2020/8687)* (Sydney Metro, 2021b), respectively.

Next steps

The Department of Planning, Industry and Environment will review the Environmental Impact Statement, submissions received, and this Submissions Report.

Once the Department of Planning, Industry and Environment has completed its assessment, a draft Environmental Assessment Report would be prepared for the Secretary of the Department of Planning, Industry and Environment, which may include recommended conditions of approval for the parts of the project that are subject to the NSW *Environmental Planning and Assessment Act 1979*. The Environmental Assessment Report would then be provided to the Minister for Planning and Public Spaces.

The Minister for Planning and Public Spaces would then decide whether or not to approve the State significant infrastructure project and identify any conditions of approval that would apply under the NSW planning regime. The Minister's determination, including any conditions of approval and the Environmental Assessment Report, would be published on the Department of Planning, Industry and Environment Major Projects website. Sydney Metro would continue to consult with community members, government agencies and other stakeholders during further design development and construction to minimise potential impacts on the environment and the community.

1 Introduction

This chapter provides an overview of Sydney Metro – Western Sydney Airport, the statutory context and planning approval process, and the purpose and structure of this Submissions Report.

1.1 Overview

The Project is a significant initiative outlined in various State, regional and local policies and plans that would deliver on the shared objective of connecting rail to the Aerotropolis and Western Sydney International in time for the planned start of passenger services at the airport.

Sydney is expanding and the NSW Government is working hard to deliver an integrated transport system that meets the needs of customers now and in the future. The delivery of Sydney Metro – Western Sydney Airport (the project) is critical to delivering an integrated transport system for the Western Parkland City and is identified in a number of key strategic planning documents including the *Greater Sydney Region Plan* (Greater Sydney Commission, 2018a), *Future Transport 2056* (Transport for NSW, 2018) and the *NSW State Infrastructure Strategy 2018 – 2038* (Infrastructure NSW, 2018).

Sydney Metro is Australia's biggest public transport program. Services started on the Metro North West Line between Rouse Hill and Chatswood in May 2019 on this new stand-alone metro railway system, which is revolutionising the way Greater Sydney travels. Sydney Metro's program of work is shown in Figure 1-1 and includes:

- **The Metro North West Line** – Opened in May 2019 with driverless trains running every four minutes in the peak in each direction between Tallawong Station in Rouse Hill and Chatswood
- **Sydney Metro City & Southwest** – A new 30-kilometre metro line extending the new metro network from the end of the Metro North West Line at Chatswood, under Sydney Harbour, through the Sydney CBD and southwest to Bankstown. It is due to open in 2024 with capacity to run a metro train every two minutes each way under the centre of Sydney
- **Sydney Metro West** – A new 24-kilometre metro line that will connect Greater Parramatta with the Sydney CBD. Confirmed stations include Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Sydney CBD. This infrastructure project will double the rail capacity between Greater Parramatta and the Sydney CBD with a travel time target between the two centres of about 20 minutes
- **Sydney Metro – Western Sydney Airport (this project)** – A new metro rail line between St Marys in the north and the Aerotropolis Core precinct in the south (the area to be called Bradfield), via Western Sydney International (Nancy-Bird Walton) Airport (Western Sydney International). The project would provide a connection between the existing Sydney Trains suburban rail network at St Marys and six new metro stations, including two at Western Sydney International and one at the Aerotropolis.

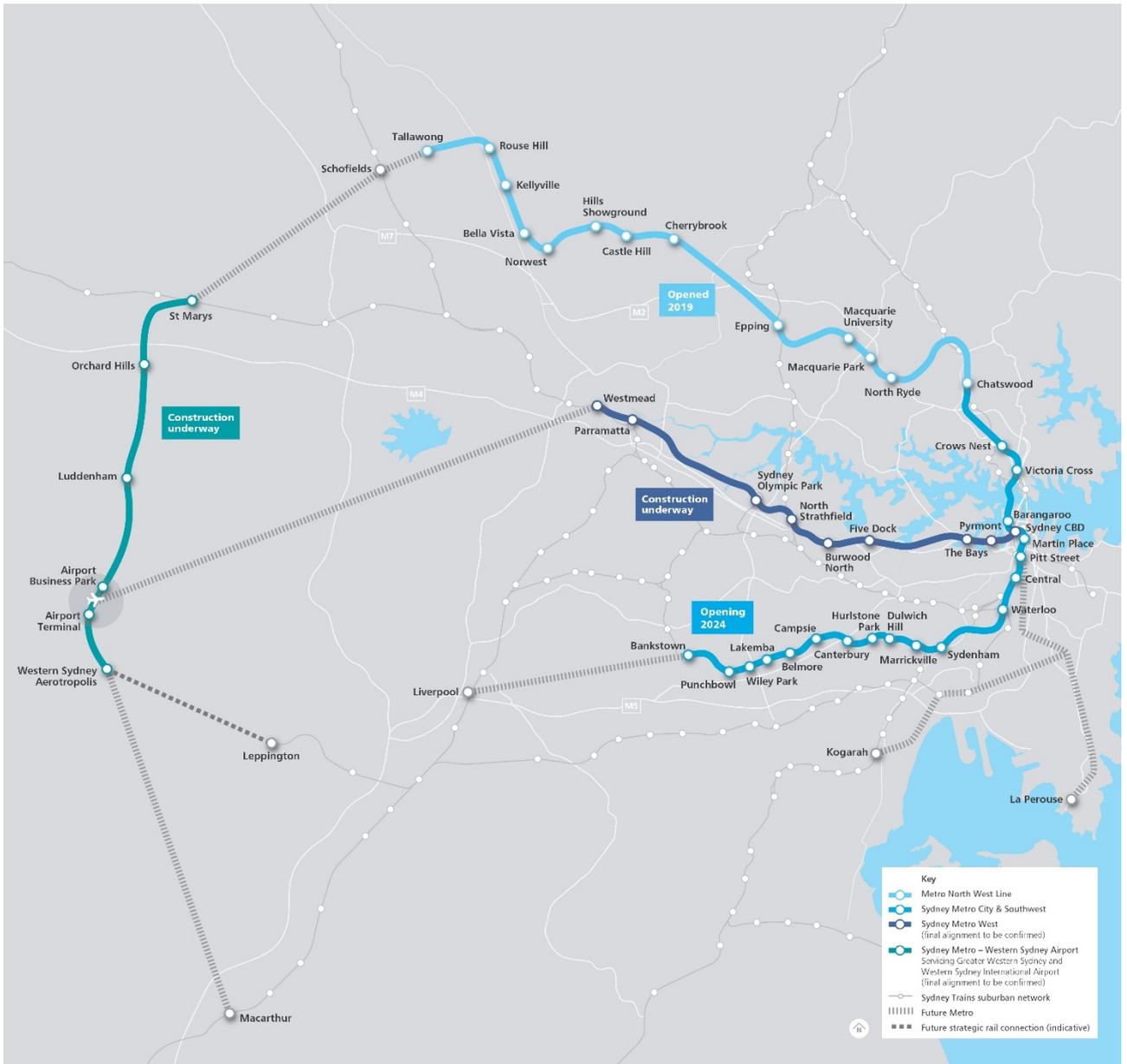


Figure 1-1 Sydney Metro network

1.2 Sydney Metro – Western Sydney Airport

The Sydney Metro – Western Sydney Airport (the project) would become the transport spine for Greater Western Sydney, connecting communities and travellers with Western Sydney International and the growing region. The city-shaping project would provide a major economic stimulus for Western Sydney, supporting more than 14,000 jobs during construction for the NSW and national economies, including more than 250 new apprenticeships.

The project involves the construction and operation of a metro rail line around 23 kilometres in length, between St Marys in the north and the Aerotropolis Core precinct in the south (the area to be called Bradfield), via Western Sydney International (see Figure 1-2).

Station locations for the project would include:

- a new metro station connecting to, and providing interchange with, the existing Sydney Trains suburban rail network at St Marys, north of Western Sydney International
- two new metro stations between the existing Sydney Trains suburban rail network at St Marys and Western Sydney International: one at Orchard Hills and one at Luddenham within the Northern Gateway precinct
- two new metro stations within the Western Sydney International site: one at the Airport Terminal and one at the Airport Business Park
- a new metro station within the Aerotropolis Core precinct (the area to be called Bradfield), south of Western Sydney International.

The alignment of the new metro railway line would:

- include a combination of tunnel, surface and viaduct sections
- interface with key roads including the Great Western Highway, M4 Western Motorway, Luddenham Road, the future M12 Motorway, The Northern Road, Elizabeth Drive and Badgerys Creek Road, as well as key utilities such as the Warragamba to Prospect Water Supply Pipelines
- include waterway crossings of Blaxland Creek and Cosgroves Creek.

The project includes works required to support its construction and operation, including all operational systems and infrastructure such as fresh air ventilation systems, signalling, communications, overhead wiring, rail corridor fencing and access tracks/paths.

A stabling and maintenance facility and operational control centre would be required to support operation of the project. The facility is proposed to be located in Orchard Hills, to the south of Blaxland Creek and east of the proposed metro line. Services facilities are proposed at Claremont Meadows and Bringelly for the St Marys to Orchard Hills tunnel and Western Sydney International to Bringelly tunnel, respectively. The need for the Claremont Meadows services facility is subject to further investigation.

Appendix B (Revised project description and performance outcomes and mitigation measures) of this report provides a full description of the construction and operation of the project, including the clarifications described in Chapter 6 (Environmental Impact Statement clarifications).

The environmental impact assessment of the clarifications is set out in Chapter 6 (Environmental Impact Statement clarifications).

Early works, including site investigations, were undertaken in 2020 and would continue to be undertaken in 2021; however, these works are subject to separate approval as they are outside the scope of the Environmental Impact Statement and this Submissions Report.

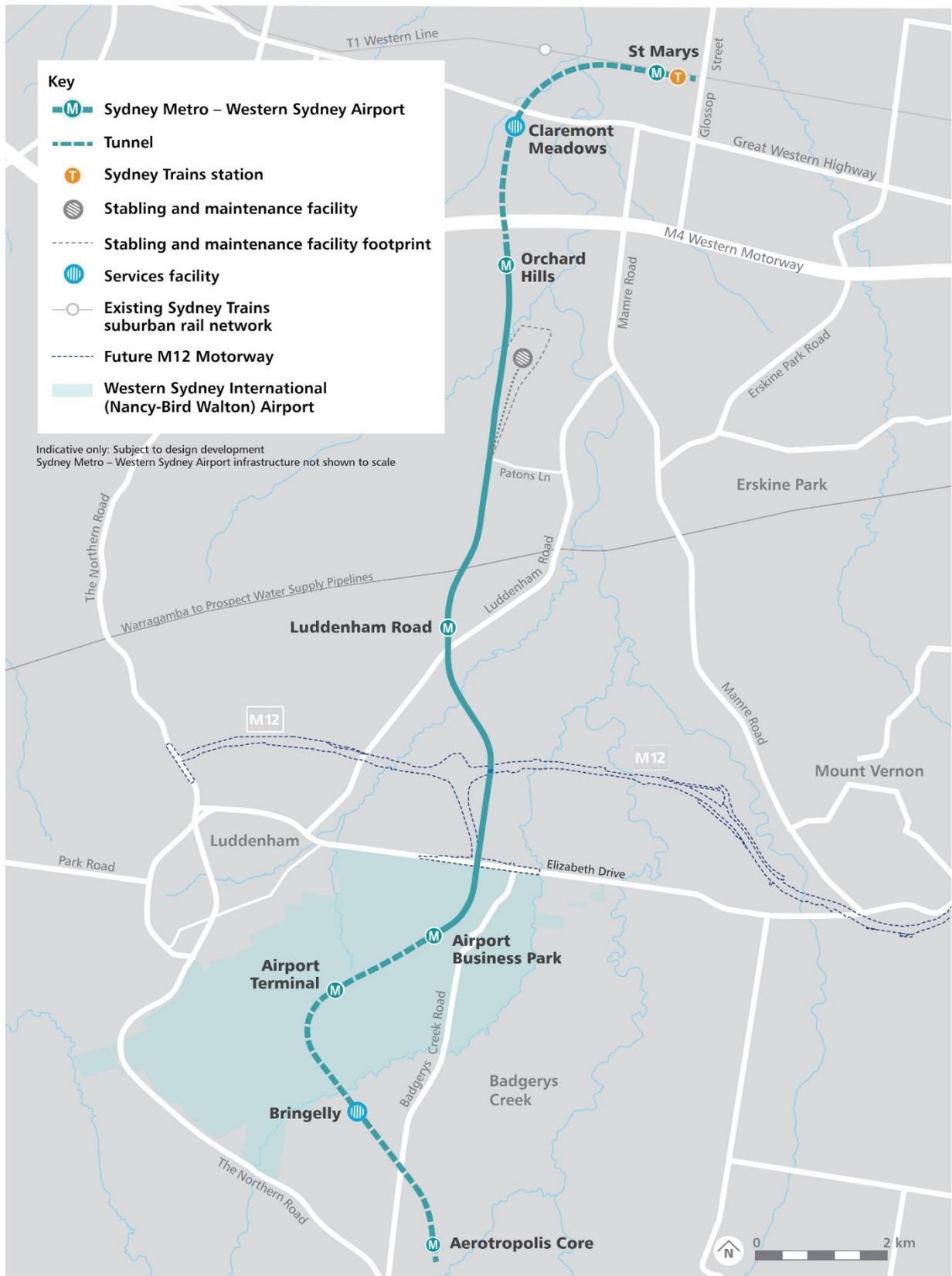


Figure 1-2 Overview of the project

1.2.1 Construction works and program

A number of construction sites would be needed for construction of the project. The construction sites would be confirmed once a construction contractor(s) has been appointed. The construction sites include locations for:

- tunnel boring machine (TBM) launch and support
- TBM retrieval
- civil structures and earthworks support
- station and precinct works
- ancillary facility construction
- concrete batching and precast concrete segment and viaduct manufacturing facilities.

Enabling works (preliminary construction works required to facilitate the start of substantial construction) would likely begin before main construction works, while some enabling works would continue concurrently with the main construction works.

Main construction works for the project include:

- tunnelling and associated works
- corridor and associated works including earthworks, construction of bridge and viaduct structures and rail systems fitout
- station and associated works including excavation, fitout and precinct and transport integration works
- ancillary facilities and associated works such as the stabling and maintenance facility and services facilities.

Following the main construction works, finishing works and testing and commissioning would be undertaken.

The indicative timeframe for the project is for main construction to commence in 2021 and take about five years to complete, subject to project approval. The final construction methodology and program would be developed by the construction contractor(s) when appointed.

1.3 Assessment and approval process

The three principal statutory schemes that govern the planning and assessment process for the project are:

- the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) - applies to works located on State land outside the boundary of Western Sydney International (off-airport)
- the *Airports Act 1996* (Cth) (Airports Act) - applies to works located within the boundary of Western Sydney International (on-airport)
- the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act):
 - for works located north of Western Sydney International (off-airport), assessment and approval is required under Part 8 and 9 of the EPBC Act to address impacts on listed threatened species and communities and Commonwealth land
 - for the lands located south of Western Sydney International (off-airport), impacts on matters of national environmental significance (MNES) and Commonwealth land have already been assessed and approved under a strategic assessment in accordance with Part 10 of the EPBC Act.

This Submissions Report provides the response to submissions required under the NSW EP&A Act.

Figure 1-3 shows the statutory approval regime applicable to different areas of the project areas, and an overview of the approvals process for the project is shown in Figure 1-4.

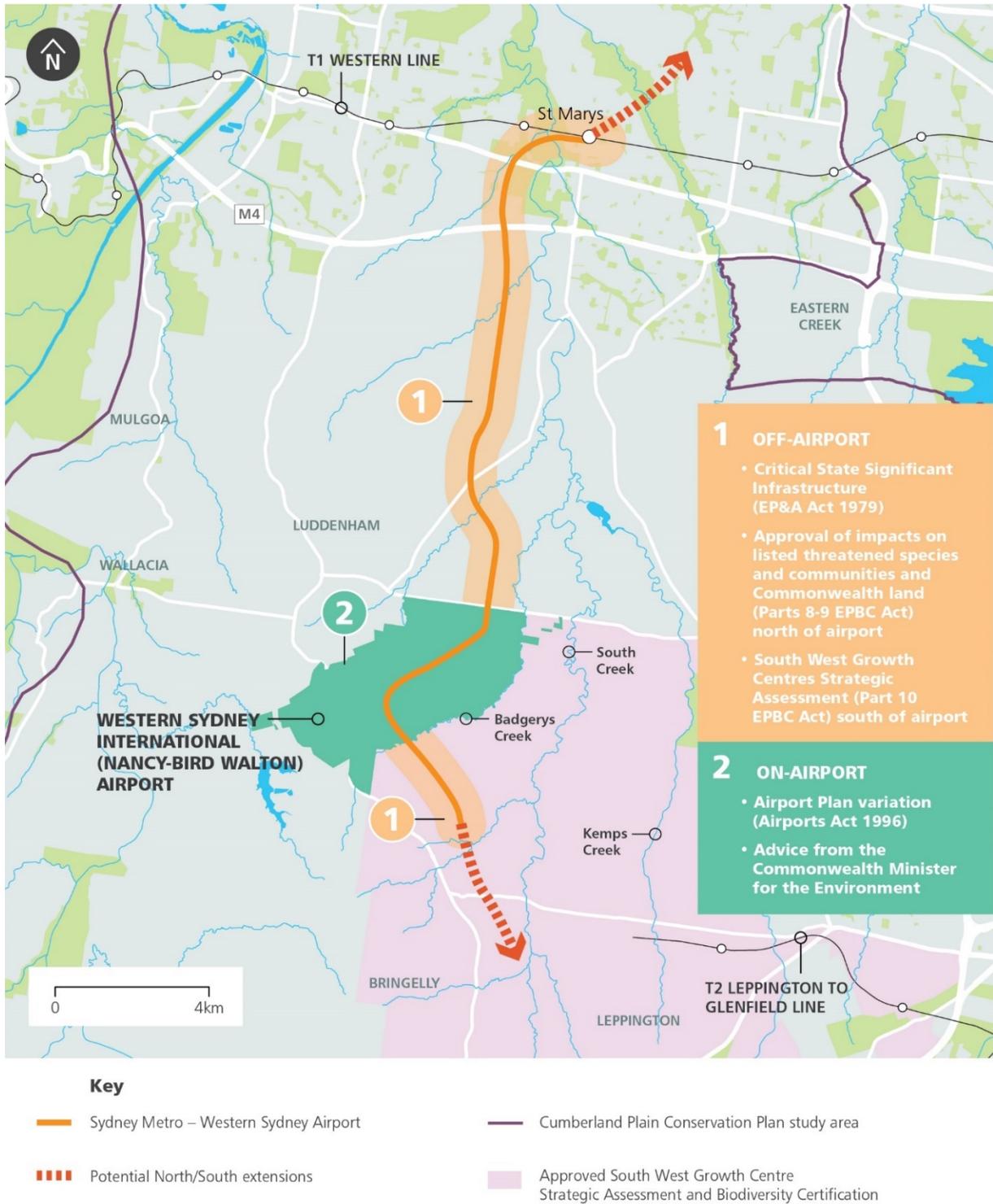


Figure 1-3 Planning approval context

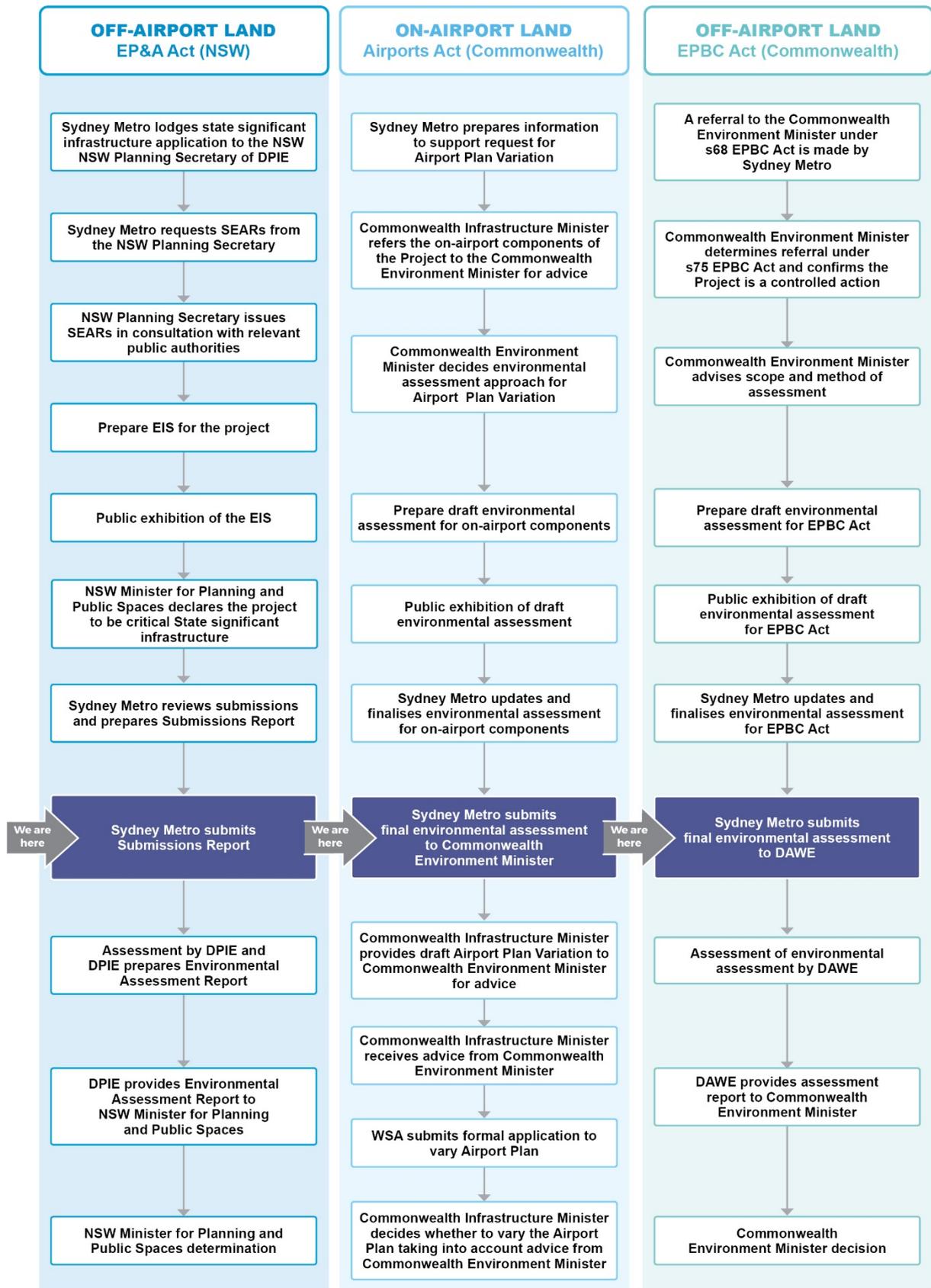


Figure 1-4 Planning approval context

1.3.1 Planning approval off-airport

The off-airport components of the project are subject to assessment and approval under the provisions of both State and Commonwealth environmental planning requirements, being the EP&A Act and the EPBC Act respectively.

Environmental Planning and Assessment Act 1979 (NSW)

The project is State significant infrastructure under section 5.12 of the EP&A Act and was declared critical State significant infrastructure under section 5.13 of the EP&A Act on 16 December 2020. Therefore, the project is subject to assessment and approval by the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.

The *Sydney Metro – Western Sydney Airport Environmental Impact Statement* (Sydney Metro, 2020a) (referred to as the Environmental Impact Statement throughout this Submissions Report) was prepared to support Sydney Metro's application for approval as State significant infrastructure to the Minister for Planning and Public Spaces under section 5.15 of the EP&A Act. As discussed in Section 1.3.2, while the State significant infrastructure approval process excludes the on-airport project, the Environmental Impact Statement included an assessment of all project components (off-airport and on-airport).

The Environmental Impact Statement was placed on public exhibition by the Department of Planning, Industry and Environment for a period of six weeks from 21 October 2020 to 2 December 2020.

During the exhibition period government agencies, key stakeholders and members of the community were able to review project information online via an interactive portal (including an interactive project map and videos from members of the project team) and virtual community engagement room or interact with the project team via digital consultation and engagement tools and forums, request further information from Sydney Metro and make a submission to the Department of Planning, Industry and Environment for consideration in its assessment of the application.

Environment Protection and Biodiversity Conservation Act 1999 (Cth)

Approval under Part 9 of the EPBC Act is also required where there is potential for significant impacts on protected matters (MNES and Commonwealth land) for the off-airport components of the project on land to the north of Western Sydney International. A Commonwealth referral was submitted (reference number: EPBC 2020/8687) for these off-airport components of the project and the project has been deemed to be a controlled action by the Commonwealth Environment Minister because of its likely impacts on listed threatened species and ecological communities and Commonwealth land.

The Environmental Impact Statement for the project included both an assessment in relation to listed threatened species and ecological communities for off-airport works to the north of Western Sydney International (provided in the *Sydney Metro – Western Sydney Airport, Biodiversity Development Assessment Report* (Sydney Metro 2020b)) as well as an assessment of the environmental impacts on Commonwealth land (provided in Appendix K (EPBC Act Draft Environmental Impact Assessment of off-airport proposed action (EPBC 2020/8687) of the Environmental Impact Statement).

The *Sydney Metro – Western Sydney Airport, Biodiversity Development Assessment Report* provided in the Environmental Impact Statement has been updated (refer to Revised Biodiversity Development Assessment Report (Appendix G)) based on additional field surveys undertaken and the clarifications provided in Chapter 6 (Environmental Impact Statement clarifications).

The EPBC Act Draft Environmental Impact Assessment of off-airport proposed action was exhibited between 21 October and 18 November 2020 in accordance with section 95A of the EPBC Act. Following exhibition, the Environmental Impact Assessment document has been finalised to reflect minor design changes, the Revised Biodiversity Development Assessment Report (Appendix G) and to provide a response to feedback received during exhibition. This Final Environmental Impact Assessment document is provided in *EPBC Act Final Environmental Impact Assessment of off-airport proposed action (EPBC 2020/8687)* (Sydney Metro, 2021b).

The off-airport components of the project on land to the south of Western Sydney International constitute an action that is part of the endorsed strategic assessment program for the Sydney Growth Centres under Part 10 of the EPBC Act. As such, no further assessment or approval is required for this component of the project under the EPBC Act.

1.3.2 Planning approvals on-airport

The project traverses, and provides stations within, Western Sydney International, on land owned by the Commonwealth and currently leased to the Western Sydney Airport.

Assessment and approval of the components of the project located within the airport site is governed by the Airports Act and is outside the scope of the State significant infrastructure process provided for under the EP&A Act. State planning law does not apply to land controlled by the Airports Act.

The on-airport components of the project require the current *Western Sydney Airport – Airport Plan* (Airport Plan) (Department of Infrastructure and Regional Development, 2016a) to be varied in accordance with the Airports Act. The variation of the Airport Plan is a step to which section 160 of the EPBC Act applies. Section 160 and following sections of the EPBC Act set out a process for the Commonwealth Environment Minister to provide advice, and include the referral of the proposed action and the assessment of environmental impacts.

The Commonwealth Infrastructure Minister is responsible for varying the Airport Plan (subject to seeking and considering advice from the Commonwealth Environment Minister). The Commonwealth Environment Minister advised that the assessment approach to inform the proposed variation of the Airport Plan should be in the form of preliminary documentation.

While the project on-airport is excluded from the State significant infrastructure process, the Environmental Impact Statement comprised an assessment of all project components (off-airport and on-airport), including the assessment required under Commonwealth legislation and in accordance with the requirements of the Commonwealth Environment Minister for the on-airport components of the project. Appendix J (EPBC Act Draft Environmental Impact Assessment of on-airport proposed action (EPBC 2019/8541)) of the Environmental Impact Statement provided a consolidated assessment for the on-airport proposed action in a single document which meets the preliminary documentation requirements of the Commonwealth Environment Minister for the on-airport components of the project.

The EPBC Act Draft Environmental Impact Assessment of on-airport proposed action was exhibited between 21 October and 18 November 2020 in accordance with section 95A of the EPBC Act. Following exhibition, the Environmental Impact Assessment document has been finalised to reflect minor design changes and to provide a response to feedback received during exhibition. This Final Environmental Impact Assessment document is provided in the *EPBC Act Final Environmental Impact Assessment of on-airport proposed action (EPBC 2019/8541)* (Sydney Metro, 2021a).

Other permits and approvals would be required for the project on-airport. These would include building approvals issued under the Commonwealth Airports (Building Control) Regulations 1996 as well as a permit under Part 13 of the EPBC Act for the clearing of listed threatened ecological communities (TECs) on-airport.

Approval under Part 9 of the EPBC Act is not required for the on-airport components of the project.

1.4 Purpose and structure of this report

During exhibition of the Environmental Impact Statement, 40 submissions were received by the Department of Planning, Industry and Environment. The Secretary of the Department of Planning, Industry and Environment requested Sydney Metro to provide a response to submissions that addresses the issues identified in the submissions from members of the public, interest groups and NSW Government agencies.

This Submissions Report presents responses to submissions received during exhibition of the Environmental Impact Statement. In addition, Chapter 6 (Environmental Impact Statement clarifications) presents clarifications to some of the information presented in the Environmental Impact Statement, identifies minor changes and assesses the potential environmental impacts of those changes.

The structure and content of this report is outlined in Table 1-1.

Table 1-1 Structure and content of this report

Chapter	Description
Chapter 1 Introduction (this chapter)	Outlines the key features of Sydney Metro – Western Sydney Airport, the assessment and approval process and the purpose of this report.
Chapter 2 Stakeholder and community consultation	Outlines stakeholder and community engagement carried out during and following exhibition of the Environmental Impact Statement and proposed future engagement activities.
Chapter 3 Analysis of submissions	Provides a summary of the submissions received during public exhibition of the Environmental Impact Statement including the number of submissions, types of submitters, and issues raised.
Chapter 4 Community submissions	Identifies issues raised by the community and provides responses to those submissions.
Chapter 5 NSW Government and key stakeholder submissions	Identifies issues raised by government agencies, local councils and key stakeholders, and provides responses to those submissions.
Chapter 6 Environmental Impact Statement clarifications	Provides clarification on information presented in the Environmental Impact Statement and identifies minor changes and assesses the potential environmental impacts of those changes.
Chapter 7 Revised performance outcomes and mitigation measures	Provides the complete set of performance outcomes and revised mitigation measures indicating changes required as a result of clarifications, minor changes or response to submissions.
Chapter 8 Conclusion and next steps	Provides a conclusion to the Submissions Report and outlines next steps in the approval process.
References and glossary	Provides the references, terms and abbreviations used in this Submissions Report.
Appendices	<p>Appendix A – Where to find responses to issues raised in community submissions</p> <p>Appendix B – Revised project description and performance outcomes and mitigation measures</p> <p>Appendix C – Overarching Community Communications Strategy</p> <p>Appendix D – Design Guidelines</p> <p>Appendix E – Construction Environmental Management Framework</p> <p>Appendix F – Construction Noise and Vibration Standard</p> <p>Appendix G – Revised Biodiversity Development Assessment Report</p> <p>Appendix H – Revised Aboriginal Cultural Heritage Assessment Report</p> <p>Appendix I – Aboriginal Cultural Heritage Management Plan</p> <p>Appendix J – Aboriginal Archaeological Report</p> <p>Appendix K – Archaeological Research Design</p>

2 Stakeholder and community consultation

This section outlines the community and stakeholder engagement undertaken during and following the exhibition of the Sydney Metro – Western Sydney Airport Environmental Impact Statement, and the future consultation proposed for the project.

2.1 Consultation overview

Sydney Metro (formerly Transport for NSW) has been engaging with the community, stakeholders and industry since 2015 and feedback gathered has helped shape the project. Sydney Metro will continue to work with the community and stakeholders to receive further feedback about the project. Sydney Metro's approach to consultation and engagement and activities undertaken to inform project development is discussed in Chapter 5 (Stakeholder and community engagement) of the Environmental Impact Statement.

The Environmental Impact Statement was placed on public exhibition in October 2020 while restrictions were in place in response to the COVID-19 pandemic. With face-to-face engagement restricted, Sydney Metro adapted to the changing circumstances by tailoring its engagement approach to ensure the community could still learn about the project, have their questions answered, and understand how to have their say while the Environmental Impact Statement was on exhibition.

The tailored engagement approach included building an interactive portal and engaging with stakeholders through a program of proactive stakeholder outreach.

Sydney Metro will continue to work with stakeholders and the community to ensure they are informed about the project and have opportunities to provide feedback to the project team.

2.2 Consultation during Environmental Impact Statement exhibition

2.2.1 Public exhibition of the Environmental Impact Statement

The Environmental Impact Statement was placed on public exhibition by the Department of Planning, Industry and Environment for a period of six weeks from 21 October 2020 to 2 December 2020.

Section 5.5 of the Environmental Impact Statement provides a list of communication tools and channels that were implemented during public exhibition including the project website, an online interactive portal, emails, social media campaigns and print advertising.

The Environmental Impact Statement was made publicly available on the Department of Planning, Industry and Environment's Major project website (www.planningportal.nsw.gov.au/major-projects/project/35016) and by Sydney Metro on an online interactive portal (www.sydneymetro.info/wsaportal). The interactive portal provided all of the Environmental Impact Statement documents, an interactive map of the project, videos from project subject matter experts, a virtual information room, a virtual reality tour of a future station, and information on how to make a submission. The portal also included planning documents, an Environmental Impact Statement summary booklet, and information on what community members could expect in their area once construction begins.

2.2.2 Consultation activities

During the exhibition period, Sydney Metro consulted with government agencies, key stakeholders and the community. The following consultation activities were undertaken to support the exhibition of the Environmental Impact Statement:

- virtual community engagement
- virtual stakeholder briefings as requested
- phone calls and emails.

2.2.3 Engagement tools and materials

The following tools and materials were developed to engage with stakeholders and support the exhibition of the Environmental Impact Statement:

- phone calls
- project email updates to the project mailing list

- virtual meetings
- interactive portal
- virtual reality tour of a future station
- Sydney Metro website
- letterbox drops of project newsletter and EIS exhibition reminder flyer
- media release
- newspaper advertisements
- social media
- Environmental Impact Statement summary booklets
- translated materials
- planning documents (hard-copy delivered as required)
- project information magnets
- outreach packs for organisations.

2.2.4 Community contact and information points

The community contact and information tools outlined in Table 2-1 were in place while the Environmental Impact Statement was on exhibition and will remain in place for the remainder of the planning and approval process.

Table 2-1 Community contact and information points

Community contact method	Contact details / information points
Community information line (toll free)	1800 717 703 (24 hours a day)
Community email address	sydneymetrowsa@transport.nsw.gov.au
Website	www.sydneymetro.info
Postal address	Sydney Metro – Western Sydney Airport PO Box K659, Haymarket, NSW 1240

2.2.5 Virtual community engagement

Sydney Metro has developed new and innovative ways to engage with stakeholders and the community through an interactive portal and a virtual information room for the project. The virtual community engagement also responded to the restrictions as a result of COVID-19 during the exhibition of the Environmental Impact Statement.

Interactive portal

Sydney Metro launched an interactive portal at the commencement of the exhibition period to provide an informative and accessible way for the community to view and access the Environmental Impact Statement and project information. Community members were able to explore an interactive alignment map and learn what to expect from the project in their area, with a 'search address' function allowing visitors to view the proximity of their property or business to the project. The portal displayed key information from the Environmental Impact Statement and helped depict key activities that the community would see in their local area during construction.

Using a multimedia platform that could be translated into a number of languages, the approach was intended to be informative, relevant and accessible, with the ability to reach people of all backgrounds including culturally and linguistically diverse communities and people who may normally have difficulty participating in the engagement of major projects.

During the exhibition period the interactive portal received 10,334 page views. Individually, the interactive map was viewed 1,971 times, the project documents were viewed 589 times, and the 'make a submission' page was viewed 188 times.

An image of the interactive portal is provided in Figure 2-1.

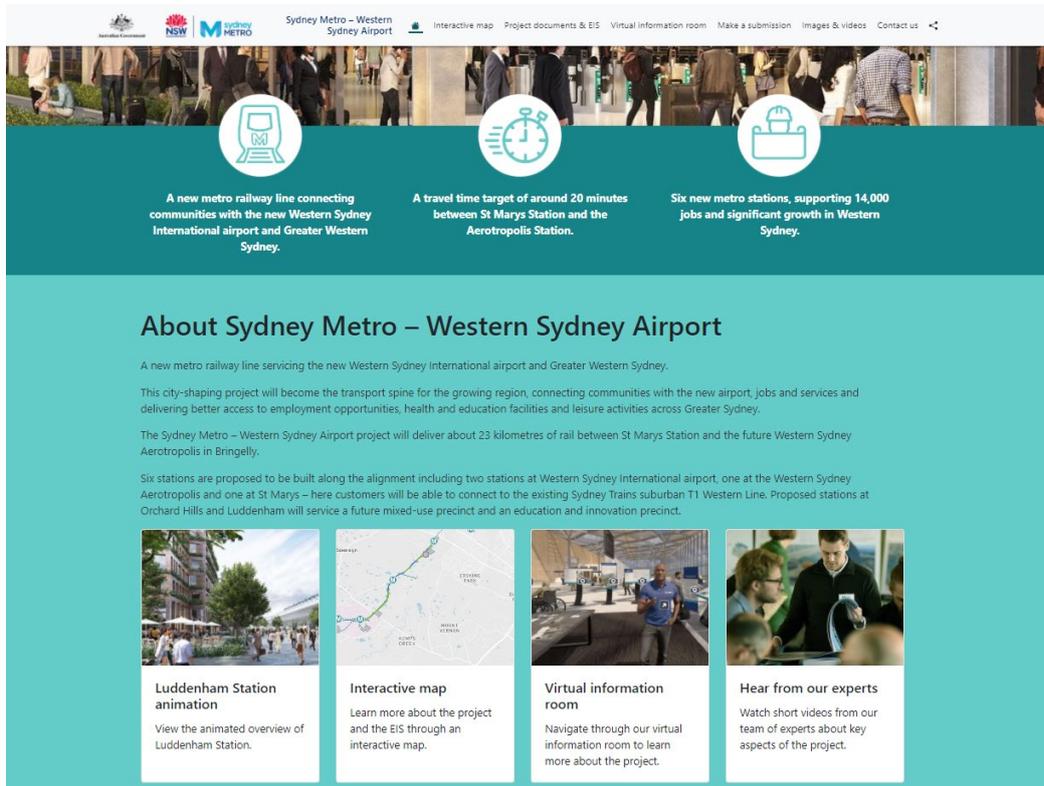


Figure 2-1 Image from the interactive portal

Virtual information room

The interactive portal was also used to host a virtual information room. The virtual information room gave the community and stakeholders the opportunity to ‘walk around’, read information boards and view videos from subject matter experts, just as they would at a traditional community information session. A key feature of the virtual information room was a series of videos featuring members of the project team explaining the more complex aspects of the project including tunnelling, planning and placemaking.

The virtual information room was viewed 734 times during the exhibition period.

An image of the virtual information room is provided in Figure 2-2.

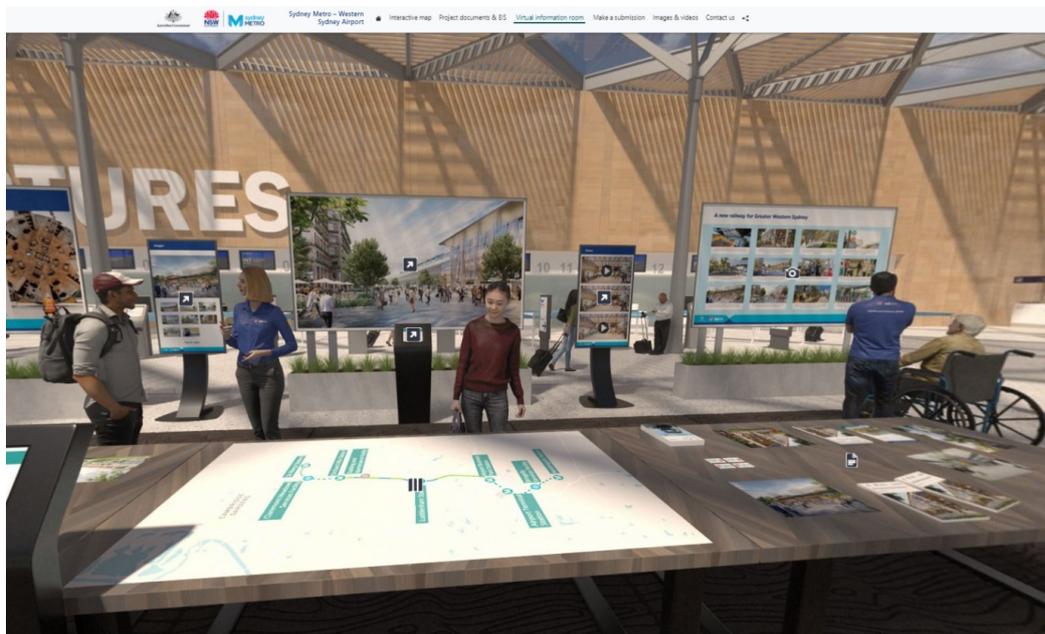


Figure 2-2 Image of the virtual information room

2.2.6 Phone calls and social media

During the exhibition period Sydney Metro made a total of 29 phone calls to the community. Two social media campaigns also reached 81,204 people.

The key topics raised by the community via phone calls (separate to the submissions received which are analysed in Chapter 3 (Analysis of submission)) included:

- overall project interest
- project timing and staging
- community engagement
- public transport interchange
- supplier/employment opportunities.

2.2.7 Media release

A Government media release for the Environmental Impact Statement was issued on 21 October 2020 titled: 'Have your say on the Western Sydney Airport metro project' to inform and encouraged the community to view the interactive portal and provide feedback on the Environmental Impact Statement.

2.2.8 Newspaper advertisements

Newspaper advertisements were placed in seven newspapers to promote the Environmental Impact Statement exhibition. These newspapers included a major Sydney daily newspaper, two local newspapers and four covering a culturally and linguistically diverse distribution.

Table 2-2 outlines the outlets which were used to promote the Environmental Impact Statement exhibition.

Table 2-2 Print advertising during exhibition

Type of print media	Media outlet	Date published	Circulation/readership
Sydney Metro - Western Sydney Airport National print advertisements	<ul style="list-style-type: none"> • The Daily Telegraph 	<ul style="list-style-type: none"> • 22 October 2020 	<ul style="list-style-type: none"> • 653,800
Sydney Metro - Western Sydney Airport Local print advertisements	<ul style="list-style-type: none"> • Liverpool City Champion 	<ul style="list-style-type: none"> • 21 October 2020 	<ul style="list-style-type: none"> • 48,751
	<ul style="list-style-type: none"> • Penrith Western Weekender 	<ul style="list-style-type: none"> • 23 October 2020 	<ul style="list-style-type: none"> • 76,000
Sydney Metro - Western Sydney Airport culturally and linguistically diverse print advertisements	<ul style="list-style-type: none"> • An Nahar (Arabic) 	<ul style="list-style-type: none"> • 22 October 2020 	<ul style="list-style-type: none"> • 20,800
	<ul style="list-style-type: none"> • Chieu Duong (Vietnamese) 		<ul style="list-style-type: none"> • 60,000
	<ul style="list-style-type: none"> • Australian Chinese Daily (Chinese) 		<ul style="list-style-type: none"> • 10,000
	<ul style="list-style-type: none"> • La Fiamma (Italian) 		<ul style="list-style-type: none"> • 44,345

2.2.9 Project email updates and letterbox drops

Four emails were sent for the Sydney Metro – Western Sydney Airport Environmental Impact Statement campaign to a maximum of 30,967 subscribers on the following dates:

- email 1 – EIS announcement (part of project update) - sent 21 October (all subscribers) 27,750 subscribers
- email 2 – EIS announcement (part of project update) - sent 22 October (resend to additional Sydney Metro – Western Sydney Airport subscribers) 3,056 subscribers
- email 3 – EIS reminder email - sent 12 November (Sydney Metro – Western Sydney Airport only update email) 5,533 subscribers

- email 4 – EIS reminder email (part of project update) - sent 24 November (all subscribers) 30,967 subscribers.

A project newsletter was distributed on 3 November 2020 to around 2,600 households along the project alignment. The newsletter provided an overview of the project and encouraged community members to have their say on the project. A magnet was included in the newsletter which contained the project's contact information.

A project flyer was distributed on 19 November 2020 to around 2,600 households along the project alignment, to remind community members that the Environmental Impact Statement was still on exhibition and to have their say on the project.

2.2.10 Printed Environmental Impact Statement locations

Hard copies of the Environmental Impact Statement were provided for the community to review in person during the exhibition period at the following locations:

- Penrith Council Chambers – 601 High Street, Penrith
- Penrith Library – 601 High Street, Penrith
- St Marys Library – 207-209 Queen Street, St Marys
- Liverpool Council Customer Service Centre – 33 Moore Street, Liverpool
- Carnes Hill Library – 600 Kurrajong Road, Carnes Hill
- State Library of NSW – Corner of Macquarie Street and Shakespeare Place, Sydney.

2.2.11 Environmental Impact Statement summary booklets

An A3 size full colour summary booklet of the Environmental Impact Statement was created to provide a summary of the information in the Environmental Impact Statement. The booklet was opened online 615 times and downloaded 55 times from the interactive portal and Sydney Metro website.

2.2.12 Sydney Metro website

The Sydney Metro website provided detailed project information throughout the exhibition period. The website provided a link to the interactive portal and downloadable documents, including the Environmental Impact Statement summary booklets and newsletters.

The Sydney Metro – Western Sydney Airport web page received 12,960 page views during the exhibition period.

2.3 Consultation following exhibition

After the Environmental Impact Statement exhibition period, Sydney Metro consulted with or provided briefings to community members, organisations, key stakeholders and government agencies regarding submissions received (where requested) or as part of ongoing consultation activities, including:

- Commonwealth Department of Agriculture, Water and Environment
- Commonwealth Department of Infrastructure, Transport, Regional Development and Communications
- Department of Planning, Industry and Environment (Environment, Energy and Science) (EES)
- Heritage Working Group (including Heritage Council of NSW, Sydney Trains, Department of Planning, Industry and Environment)
- Heritage NSW (Aboriginal Cultural Heritage Regulation Branch), now part of the Department of Premier and Cabinet
- Transport for NSW
- Liverpool City Council
- Penrith City Council
- NSW Environment Protection Authority (EPA)
- Western Sydney Airport

- Western Parkland City Authority
- Schools Infrastructure NSW
- Registered Aboriginal Parties
- individual stakeholders, where requested.

2.4 Ongoing consultation and engagement activities

2.4.1 Submissions Report

Sydney Metro will submit this Submissions Report to the Department of Planning, Industry and Environment. The report will be made available to the public on the Department of Planning, Industry and Environment's website. Government agencies, project stakeholders and the community will be able to review the report online. The Department of Planning, Industry and Environment will review the Submissions Report as part of their assessment of the Sydney Metro – Western Sydney Airport project.

Sydney Metro will notify the community about the Submissions Report via the following communication channels:

- direct emails to community members and stakeholders
- key stakeholder briefings
- updates on the Sydney Metro website and interactive portal
- stakeholder outreach by place managers.

2.4.2 Project approval

If the project is approved, the conditions of approval would be placed on the Department of Planning, Industry and Environment's website.

Communication tools used to assist the community in their understanding of the approval would include:

- media release
- direct email distributed to the community
- Sydney Metro website and interactive portal updates
- social media posts
- newspaper advertisements.

2.4.3 Ongoing consultation and engagement activities

Sydney Metro would continue to work with stakeholders and the community to ensure they are informed about the project and have opportunities to provide feedback to the project team.

Sydney Metro recognises the diverse engagement and information needs of the community and stakeholders and is committed to robust and transparent engagement processes that are inclusive in nature. Table 2-3 outlines the planned engagement during further design development, delivery (construction) and operation, if approved. Table 2-3 is intended as a guide and would be updated with more detail closer to the start of construction.

Table 2-3 Ongoing and future engagement

Activity	Design	Delivery	Operation
Project overview document		●	
Media releases		●	
Community information sessions	●		
Traditional and social media engagement	●	●	●
Doorknocks with neighbouring properties	●	●	●
Newsletter letterbox drop	●	●	●
Project website and online forums	●	●	●
Newsletter advertising	●	●	●
Stakeholder meetings	●	●	●
Local business engagement	●	●	●
Local Aboriginal Land Councils and Aboriginal stakeholder engagement	●	●	●
Government stakeholder engagement	●	●	●

2.4.4 Consultation and complaints during construction

The Sydney Metro Overarching Community Communications Strategy (Appendix C) sets the requirements for stakeholder and community engagement to be undertaken during construction, should the project be approved. The strategy also includes the approach for managing ongoing consultation and coordination with Western Sydney Airport regarding activities within Western Sydney International.

Contract specific Community Communications Strategies would be developed by appointed project delivery communication teams to address contract and site specific needs of the community, stakeholders and businesses, and reflect the requirements of Sydney Metro's Overarching Community Communications Strategy. The contract specific Community Communications Strategies would also adhere to any requirements identified in any relevant conditions of the planning approval. Contractors would be required to adhere to a Construction Complaints Management System which would outline the framework for managing complaints, enquiries and escalation processes throughout the project lifecycle.

3 Analysis of submissions

This chapter provides a summary of the submissions received, including a breakdown of the types of submitters, the number of submissions received, and the key issues raised.

3.1 Submissions received

During the Environmental Impact Statement exhibition period, submissions were invited from the community and other stakeholders. The receipt of submissions was coordinated and managed by the Department of Planning, Industry and Environment.

A total of 40 submissions were received by the Department of Planning, Industry and Environment in response to the Environmental Impact Statement during the exhibition period. The submissions are available to be viewed on the Department of Planning, Industry and Environment website (www.planningportal.nsw.gov.au/major-projects/project/35016).

Submissions were also received in response to the EPBC Act Draft Environmental Impact Assessment of off-airport proposed action and EPBC Act Draft Environmental Impact Assessment of on-airport proposed action assessments for the project. One submission was received through both the State and EPBC Act draft environmental impact assessment exhibitions and as such is included within this Submission Report.

One additional submission was received on the EPBC Act draft environmental impact assessments exhibition which has been included within this report and addressed in Section 4.20. This additional submission was not included in the total of 40 submissions received through the State process which are discussed elsewhere in this report.

Some submissions received through the State process raised issues of relevance to the EPBC Act Draft Environmental Impact Assessment of off-airport proposed action and EPBC Act Draft Environmental Impact Assessment of on-airport proposed action and responses to these issues have been included in the final version of these assessment documents, as well as in this report.

A breakdown of submissions by submitter type is provided in Table 3-1. Each submission was allocated a unique identification number by the Department of Planning, Industry and Environment. Appendix A (Where to find responses to issues raised in community submissions) includes a table which lists each submission by this identification number and provides a cross-reference to the section of this report where the issues that were raised are addressed.

Table 3-1 Breakdown of submissions received

Submitter type	Number of submissions
Community submissions	
Community members	22
Community interest groups	3
Subtotal	25
Government agencies and key stakeholders	
NSW Government departments/agencies	9
Councils	3
Other key stakeholders	3
Subtotal	15
Total submissions	40

3.1.1 Community submissions

A total of 25 submissions were received from members of the community. As shown in Table 3-1 and Table 3-2, community submissions included those from:

- individual community members/residents/land owners
- local community and other interest groups, including:
 - Blacktown & District Environment Group
 - Luddenham Landowners Consortium
 - Action for Public Transport (NSW).

For the 25 community submissions, a breakdown of the submitters' location is summarised in Table 3-2.

Table 3-2 Submitter locations for community submissions

Location (local government area)	Number of submitters from that location
Penrith	4
Liverpool	3
Outside of the project area	18

3.1.2 NSW Government agency and key stakeholder submissions

A total of 15 submissions were received from NSW Government agencies (including local councils) and other key stakeholders during exhibition of the Environmental Impact Statement. Submissions raised a range of issues relevant to their respective areas of interest and responsibility. Submissions were received from the following agencies:

- Councils:
 - Penrith City Council
 - Liverpool City Council
 - Blacktown City Council
- NSW Government departments/agencies:
 - Department of Planning, Industry and Environment, Environment, Energy and Science (EES)
 - Department of Planning, Industry and Environment (Water)
 - Department of Primary Industries Fisheries (DPI Fisheries) (DPI Fisheries)
 - EPA
 - Heritage NSW (Heritage Council of NSW)
 - Heritage NSW (Aboriginal Cultural Heritage Regulation Branch)
 - WaterNSW
 - Sydney Water
 - TransGrid
- other key stakeholders:
 - University of Sydney
 - Western Sydney University
 - Urban Development Institute of Australia NSW (UDIA).

3.2 Analysis of submissions

3.2.1 Issue categorisation

The analysis of submissions included reviewing the content in each submission to identify the issues raised and split each issue raised into key issue categories (e.g. noise and vibration) and sub-issues (e.g. assessment methodology). The key issue categories and sub-issues were based on the information and environmental aspects included in the Environmental Impact Statement. This provided an understanding of the frequency of the issues that were raised and the key areas of interest. Several submissions raised items which aligned with more than one category.

3.2.2 Review of community submissions

Following the categorisation of each community submission, the issues raised were summarised and grouped according to the key issue and sub-issue categories. Each issue identified in Chapter 4 (Community submissions) is presented as a summary of the issues raised by individual submissions with careful consideration given to the intent of each submission.

Responses to the summarised issues are provided in Chapter 4 (Community submissions) according to these categories. Where relevant, input was sought from the technical specialists who assisted with the preparation of the Environmental Impact Statement.

3.2.3 Review of NSW Government agency and key stakeholder submissions

Following categorisation of each submission received from government agencies or key stakeholders, the issues within each submission were summarised. These issues and responses to the issues raised are provided in Chapter 5 (NSW Government and key stakeholder submissions). Where relevant, input was sought from the technical specialists who assisted with the preparation of the Environmental Impact Statement.

3.2.4 Support/comments/objection to the project

Submitters were asked to indicate their position on the project via the Department of Planning, Industry and Environment website as part of the submission registration process. The breakdown of support/objections received are as follows:

- nine submissions supported Sydney Metro – Western Sydney Airport
- six submissions objected to Sydney Metro – Western Sydney Airport
- 25 submissions did not offer a position and were categorised as providing comments.

3.3 Summary of issues raised

3.3.1 Key issues raised in community submissions

A breakdown of the key issues raised in unique community submissions is provided in Table 3-3 by issue category. Given most of the submissions raised more than one issue or the same issue more than once, the number of issues identified is greater than the total number of submissions received. Issues were raised a total of 86 times in the community submissions.

Table 3-3 Key issue categories raised in community submissions

Key issue category	Number of times key issue was raised	Percentage (%) of total key issues
Support for the project	7	8
Strategic context and project need	2	2
Stakeholder and community engagement	2	2
Project alternatives and options	14	16
Project description – operation	9	10
Project description – construction	1	1
Transport	6	7
Noise and vibration	4	5

Key issue category	Number of times key issue was raised	Percentage (%) of total key issues
Biodiversity	1	1
Flooding, hydrology and water quality	2	2
Groundwater and geology	3	3
Sustainability, greenhouse gas and climate change	1	1
Property and land use	6	7
Social and economic	1	1
Air quality	1	1
Hazard and risk	1	1
Cumulative impacts	1	1
Environmental management framework	1	1
Beyond the scope of the Environmental Impact Statement	23	27
Total	86	100%

The top six most frequently raised issue categories relating to the project in the community submissions are:

- beyond the scope of the Environmental Impact Statement
- project alternatives and options
- project description – operation
- support for the project
- property and land use impacts
- transport impacts.

3.3.2 Location based summary for community submissions

Table 3-4 summarises the issues raised in community submissions that could be attributed to a specific location/area. Non-location specific issues are also summarised.

Table 3-4 Summary of issues raised by project location in community submissions

Location	Summary of issues raised relevant to location
North of M4 Western Motorway	<ul style="list-style-type: none"> • comments that the project should incorporate a station at Western Sydney University's Werrington campus, and that an above-ground alignment could be provided from St Marys to Werrington to service this station • suggestion regarding realignment of the project in-tunnel at St Marys away from residential properties • suggestion that a paid concourse area should be provided for a more convenient interchange with the Sydney Trains network at St Marys • concern about parking impacts during construction and operation at St Marys • concern about ground-borne noise and vibration impacts from tunnelling works during construction • concern about noise and vibration impacts from operation of trains in tunnels • concern about flooding impacts in south St Marys including Great Western Highway • concern about ground movement impacts and impacts on structural integrity of homes in St Marys during construction • concern about impacts on future property values and impacts on future development in St Marys

Location	Summary of issues raised relevant to location
M4 Western Motorway to Warragamba to Prospect Water Supply Pipelines	<ul style="list-style-type: none"> concern about road traffic, noise and vibration and air quality impacts concern about land use and property impacts (such as property acquisition and land use changes), and associated health and wellbeing impacts concern about flooding impacts for residences in the vicinity of the stabling and maintenance facility concern about biodiversity impacts (including on native vegetation and riparian areas) within the Defence Establishment Orchard Hills (DEOH) site and stabling and maintenance facility concern about urban sprawl due to a station at Orchard Hills
Warragamba to Prospect Water Supply Pipelines to Western Sydney International	<ul style="list-style-type: none"> recommend further refinement of the precinct and interchange integration and between Luddenham Road Station and Sydney Science Park concern regarding space provisioning underneath viaduct to provide connectivity and permeability across the corridor query about land use projections used for the traffic modelling concern regarding access to Sydney Science Park during its construction and operation query about commuter car parking at Luddenham Road Station comment that the project should include mitigation measures to achieve acceptable levels of service considering the cumulative impacts of the project and operational traffic forecast for Sydney Science Park comment that the project should incorporate a station north of Elizabeth Drive concern about land use and property impacts, including property acquisition resulting in severance and fragmentation impacts concern about cumulative land use and transport impacts from the project and the future M12 Motorway
Western Sydney International (on-airport)	<ul style="list-style-type: none"> query whether a stabling and maintenance facility would be located near the rail alignment near the airport business park so that future metro extensions could share this infrastructure concerns about the need for and operation of Western Sydney International suggestions regarding active transport connections to the Airport Terminal
Western Sydney International to Aerotropolis Core	<ul style="list-style-type: none"> comment that tunnelling is not required through relatively undeveloped land between Western Sydney International and Bringelly concern about ground-borne noise and vibration impacts from tunnelling works during construction concern about ground movement impacts and impacts on structural integrity of homes during construction concern about ground movement and vibration impacts from the Western Sydney International to Bringelly tunnel query about why the gazetted corridor under the State Environmental Planning Policy (Major Infrastructure Corridors) 2020 (Corridors SEPP) is still required if the project is in-tunnel from Western Sydney International to Aerotropolis Core
Not location specific	<ul style="list-style-type: none"> general support for the project comments about the strategic context and need for the project comment that the Western Sydney 'Aerotropolis EIS' should have been finalised prior to confirming the project alignment comments about stakeholder and community engagement, including queries about complaints management and community information sessions concern about extent of tunnelling required for the project which increases the cost of the project comments regarding strategic alternatives for the project and that metro rail is not the right solution comment that more stations should be provided to provide better return on investment queries about the design of metro stations, platform and interchange design

Location	Summary of issues raised relevant to location
	<ul style="list-style-type: none"> • query about when land that is being acquired would be required for construction • query whether Sydney Metro would provide road and pedestrian overbridges at road crossings • query whether passengers travelling to and from the airport will have control to delay the closing of metro train doors • query about how substratum acquisition would be managed • comments that future metro extensions should be considered and/or prioritised • concern about how flooding and bushfire risks would be managed, including how inflows to the rail tunnels would be managed during heavy rainfall events • concern that the Environmental Impact Statement does not provide any assurances for residents during construction and general concerns about noise and vibration, air quality and loss of amenity during construction • suggestions regarding active transport connections for the Western Sydney Aerotropolis • queries and suggestions about other transport projects, including freight rail and public transport for Western Sydney International • query about the amount of reused, recycled and recyclable products that would be used for the project • concern about the inclusion of a resident's property in the Draft Cumberland Plain Conservation Plan 2020 – 56 (Department of Planning, Industry and Environment, 2020b).

3.3.3 Key issues raised in NSW Government agency and key stakeholder submissions

The most frequently raised issues by government agencies and key stakeholders (which generally reflects their area of responsibility) included:

- alternatives considered for the project
- future development of station precincts
- the need for ongoing community and stakeholder engagement
- construction and operational transport and traffic impacts
- construction noise impacts to sensitive receptors within the community
- water quality impacts, particularly regarding monitoring
- placemaking strategies and principles
- management of contamination
- property and land use impacts
- biodiversity impacts
- cumulative impacts with other large infrastructure and urban development projects.

4 Community submissions

This section provides responses to issues raised in submissions from the community and community groups. Appendix A (Where to find responses to issues raised in community submissions) includes a table which lists each submission by its identification number and provides a cross-reference to the section(s) of this report where the issues that were raised are addressed.

4.1 Support for the project

4.1.1 Support for the project

Submission identification numbers

SE-10716923, SE-11728931, SE-11746858, SE-11752741, SE-11783278, SE-11791548, SE-11774024.

Issue raised

Submitters expressed their support for the project.

Response

Sydney Metro notes the support expressed for the project.

4.2 Strategic context and project need

4.2.1 Strategic context of the project

Submission identification number

SE-11772947.

Issue raised

A submitter commented that the finalisation of the Western Sydney 'Aerotropolis EIS' should have come before the project was identified, so that the rail alignment could be located in a different area to better service precincts.

Response

The timing of the project is important as it informs long-term land use planning and provides certainty to local councils on developments in their area, which can be built around available transport infrastructure.

The project is identified in a number of key strategic planning documents including the *Greater Sydney Region Plan, Future Transport 2056* and the *NSW State Infrastructure Strategy 2018 – 2038*.

The *Western Sydney Aerotropolis Plan* (NSW Government, 2020a), has now been finalised and the *Western Sydney Airport – Environmental Impact Statement* (Department of Infrastructure and Regional Development, 2016) has been approved. Both of these documents support development of the rail line to provide access to Western Sydney International. The draft and final *Western Sydney Aerotropolis Plan* also recognises that timely and efficient provision of transport infrastructure is a key consideration to activate precincts.

The project would be the primary rail link connecting the Northern Gateway, Western Sydney International and Aerotropolis precincts identified in the *Western Sydney Aerotropolis Plan*, enabling people to access commercial, passenger and freight precincts and providing for the essential airport operations to occur.

4.3 Stakeholder and community engagement

4.3.1 Consultation during exhibition of the Environmental Impact Statement

Submission identification number

SE-11746858.

Issue raised

A submitter queried whether community information sessions would be possible as they were cancelled during exhibition due to COVID-19 restrictions. The submitter commented that the community benefits from the community information sessions.

Response

The Environmental Impact Statement was released in October 2020 while restrictions were still in place in response to the COVID-19 pandemic. With face-to-face engagement unable to be carried out, Sydney Metro adapted to the changing circumstances by modifying its engagement approach so the community could learn about the project, have their questions answered and understand how to have their say while the Environmental Impact Statement was on exhibition. An online interactive portal for the project provided all of the Environmental Impact Statement documents, an interactive map of the project, videos from project experts, a virtual information room, a virtual reality tour of a station, and information on how to make a submission. The portal also included planning documents and information on what community members could expect in their area.

Briefings or meetings were offered to those who requested this during the exhibition period.

Sydney Metro has established a 24 hour toll free community information line (1800 717 703) and a project specific community email (sydneymetrowsa@transport.nsw.gov.au) to provide information and invite feedback from the community.

Should the project be approved, Sydney Metro would continue to work with stakeholders and the community to ensure they are informed about the project and have opportunities to provide feedback to the project team. An Overarching Community Communications Strategy has been prepared for the project (Appendix C) which will guide Sydney Metro's approach to engagement with communities, stakeholders and businesses.

The planned engagement during further design development, delivery (construction) and operation, if approved, is outlined in Table 2-3.

4.3.2 Consultation during construction and complaints handling

Submission identification number

SE-11790344.

Issue raised

A submitter raised concern over how they would submit complaints during construction.

Response

A toll-free community information line (1800 717 703) is in place. This community information line provides an opportunity for the community to contact the Sydney Metro project team, ask questions and seek further information.

All complaints handling would be conducted in accordance with the Sydney Metro Construction Complaints Management System. As a requirement of the Sydney Metro Overarching Community Communications Strategy (Appendix C), contractors would be required to adhere to a Construction Complaints Management System which would outline the framework for managing complaints, enquiries and escalation processes throughout the project lifecycle. The community contact and information points outlined in Table 2-1 would also continue to remain in place for the duration of the project.

4.4 Project development and alternatives

4.4.1 Strategic alternatives

Submission identification numbers

SE-11757935, SE-11772947, SE-11791548.

Issues raised

Submitters made comments about the strategic alternatives for the project, including:

- comment that metro rail is not the right format or technological solution to meet the project objectives
- comment that the project has not been subject to a fair assessment and that metro rail was not originally identified for the north-south rail corridor
- comment that it would be better to utilise existing airports and fast rail systems
- comment that the project should be an extension of the Sydney Trains rail system and connect at Leppington and St Marys, improving customer journeys by providing a more seamless network.

Response

A strategic alternatives analysis was undertaken for the project, which is provided in Section 6.3 of the Environmental Impact Statement. This was a separate process to the identification of a rail corridor.

Overall a metro rail line was considered to be the preferred option as it:

- has the capacity to provide high frequency services to key activity centres with fast travel times and improve access to jobs
- has an ability to form the north–south spine of a fully integrated, multi-modal network
- has the potential to support growth in and serve key residential development areas with high transport amenity and capacity
- provides the greatest ultimate capacity, which will support long term growth and unlock planned growth, supporting the vision for the Western Parkland City
- would support the 30-minute city with superior travel times compared with other options considered such as light rail and other bus transport improvements.

A joint NSW and Australian Government rail needs scoping study described in the *Western Sydney Rail Needs Scoping Study Outcomes Report (Scoping Study)* (Transport for NSW and Australian Government, 2018) identified that a separated metro or light metro style of train would suit a north–south rail link. As described in Section 6.3.2 of the Environmental Impact Statement, a metro rail mass transit solution was considered to be the preferred solution during the strategic alternatives options analysis for the project because it would strongly support the city-shaping objectives of the project, while also delivering transport and productivity outcomes. A metro rail line was considered to be the preferred solution to attract investment as well as unlock and support planned growth in new jobs and homes in the growing Western Parkland City. This is because the metro product offers increased capacity for customers, faster travel times and frequent services.

Western Sydney International is currently under construction, with operations scheduled to start in 2026. The development of Stage 1 of the airport has been authorised by the Airport Plan. The need for and the operation of Western Sydney International is outside the scope of the Sydney Metro – Western Sydney Airport project and has been subject to separate approval by the Australian government (refer to Section 4.19.2 for further discussion).

A fast rail system would not be appropriate for the distances involved in connecting to Western Sydney International and planned population centres at the off-airport stations for the project.

The project would provide an easy, efficient and accessible interchange with the existing T1 Western Line and Sydney Trains railway station at St Marys, in accordance with the Sydney Metro Design Guidelines (refer to Appendix D). The South West Rail Link extension from Leppington to North Bringelly is identified as a separate project in *Future Transport 2056* (see Section 4.19.1 for further discussion). As detailed in Section 7.1.4 of the Environmental Impact Statement, the project has been designed to safeguard for future northern and southern extensions, and a connection to the South

West Rail Link at Leppington. Aerotropolis Core Station has been designed to allow for future development of the South West Rail Link extension. Figure 1-1 shows the wider Sydney Metro network and potential future extensions of the project, and Section 4.19.1 provides a more detailed response regarding these.

4.4.2 Station locations

Submission identification numbers

SE-10880634, SE-11091495, SE-11788120, SE-11791548, SE-11752741.

Issues raised

Submitters made comments on the locations considered for stations, including that the project should:

- include more stations overall to provide better return on investment and avoid commuters having to use other modes of transport to connect to the stations, especially when the project area is more densely populated
- incorporate a station at Western Sydney University's Werrington campus, including statements that slightly greater travel times between St Marys and Aerotropolis is not enough justification to exclude a station at Western Sydney University
- incorporate a station at Elizabeth Drive, providing a direct link with the future M12 Motorway and located to provide better activation of the Northern Gateway precinct.

Response

Sydney Metro – Western Sydney Airport has been designed to deliver fast and efficient metro services and preferred station locations are determined to get the best customer and community outcomes.

A number of station locations were considered to connect the T1 Western Line to the new Aerotropolis as part of the project development. The analysis of station precinct options and the outcome of this assessment is documented in Section 6.4 of the Environmental Impact Statement.

A guiding principle for Sydney Metro – Western Sydney Airport is to offer fast, high frequency services to key activity centres and facilitate a 30-minute city. A range of factors influence travel time, including the number and location of stations. A primary consideration in the project development process was to provide a balance between the number and location of stations, considering drivers such as productivity and land use benefits, accessibility, travel times and project cost. This process of station precinct identification was undertaken independently of the rail corridor alignment development process. The challenge of balancing the optimal number and location of stations with travel times has a direct influence over the land use outcomes, economic benefits, expanded customer catchments and increased network connectivity.

The assessment in Section 6.4 of the Environmental Impact Statement showed that a station at Western Sydney University's Werrington precinct would perform poorly against the 'sustainable and deliverable solution' objective and would have considerable construction, program and interface impacts and risk which outweighed the benefits of a station in this location. Further, Western Sydney University students and associated jobs growth would be outside of a 15-minute walking catchment from a station at Western Sydney University's Werrington precinct.

A more direct tunnel route between St Marys and Orchard Hills provides cost benefits in delivery of the project and travel time savings, by connecting the airport faster to the key T1 Western Line interchange at St Marys.

Compared with a station (and associated tunnel infrastructure) at St Marys and Orchard Hills, a station at Western Sydney University would:

- need to be constructed concurrently with tunnelling activities that would also need to be located at the station site, resulting in a very large property impact requirement
- require the launch and support of four TBMs (instead of two) for the St Marys to Orchard Hills tunnel in addition to station construction requirements
- result in greater travel times for customers travelling between Western Sydney International and St Marys

- require an additional three kilometres of tunnel length that would require two tunnel portal facilities (compared with up to one as part of the tunnel between St Marys and Orchard Hills), increasing comparative costs and affecting overall value-for-money.

Currently, the Western Sydney University Werrington Campus can be accessed from Kingswood Station or Werrington Station via shuttle bus, cycling, walking, bus, or driving.

Chapter 9 (Transport) of the Environmental Impact Statement outlines that the project would integrate seamlessly with the station precincts and existing and future transport interchange facilities, providing connectivity with pedestrian, cycling and public transport networks, and providing opportunities for integration with future land uses and infrastructure. Indicative transport interchange provisions proposed specifically at St Marys Station and Orchard Hills Station (the two closest metro stations to the Western Sydney University Werrington Campus) are also outlined in Section 9.6.1 of the Environmental Impact Statement.

Mitigation measure OT1 requires that interchange access plans would be prepared, in consultation with the Traffic and Transport Liaison Group and relevant authorities such as the Western Parkland City Authority and local council, to ensure adequate pedestrian and cycle facilities and other transport interchange infrastructure is provided at each station precinct. This includes the NSW Centre for Road Safety who provides expert advice on road safety risks and the integration of station precincts with the wider network, including safe access for pedestrians and cyclists.

Strategic planning for future transport solutions would be undertaken by Transport for NSW in consultation with Sydney Metro and relevant stakeholders, including Western Sydney University.

The assessment in Section 6.4 of the Environmental Impact Statement showed that a station at North Elizabeth Drive would perform poorly against the 'customer needs' and 'productivity and employment' objectives and did not perform highly with any of the other objectives such as 'transport integration, 'urban renewal and place making', and 'support of Western Sydney International and the Western Parkland City'.

Additionally, a station at North Elizabeth Drive would:

- cause potential conflicts with proposed infrastructure including the future M12 Motorway project and Elizabeth Drive
- result in additional land fragmentation in the area.

Any future enterprise or mixed use land uses within the Northern Gateway precinct would be supported by Luddenham Road Station. Station precinct and interchange facilities would be provided at Luddenham Road Station, including bike parking, park-and-ride facilities and bus interchange facilities.

Regional and local bus services would be provided to link the project to its local and wider surroundings. The frequencies of these bus services would be determined based on the travel demand at these stations. Additionally, as part of the Western Sydney City Deal, the Australian and NSW Governments have committed to delivering new rapid bus routes to link the metropolitan centres of Penrith, Liverpool and Campbelltown to the Western Sydney Aerotropolis and Western Sydney International.

4.4.3 Metro rail alignment

Submission identification numbers

SE-11752741, SE-11772947, SE-10716923.

Issues raised

Submitters raised the following comments and suggestions about the vertical and horizontal alignment of the project, including:

- comment that the project includes an excessive amount of tunnel sections which increases the cost of the project
- comment that tunnelling is unnecessary through relatively undeveloped land for the southern tunnel between Western Sydney International and Bringelly, and that a shorter tunnel to the Airport Terminal Station would be more suitable

- suggestion that an above-grade alignment should be provided alongside the T1 Western Line towards Werrington, which can then pass through Western Sydney University Penrith Campus
- suggestion that the project's tunnel alignment in St Marys should be located within the existing T1 Western Line corridor to avoid impacting residential properties at the surface.

Response

The vertical alignment options analysis for the project is summarised in Section 6.6.2 of the Environmental Impact Statement.

A tunnel alignment was selected for the project in two locations to reduce community impacts, avoid substantial property acquisition, improve land use outcomes, provide additional flexibility for transport integration, and provide the opportunity for the development of a city centre well integrated with the stations. A tunnel alignment would also provide the opportunity to create a civic focus, a vibrant city heart and high-quality public domain for the public and pedestrians on arrival to the stations. A tunnel alignment allows for unimpeded public and pedestrian connection between the built urban fabric.

For the St Marys to Orchard Hills section of the project, a tunnel alignment would avoid substantial land use and property impacts, including reducing property acquisition. It would also reduce potential environmental and social impacts associated with surface options such as impacts on endangered ecological communities, riparian zones, heritage impacts, amenity impacts, transport and access disruptions for the community and businesses, potential conflicts with other transport infrastructure, including the Great Western Highway, M4 Western Motorway and space constraints within the T1 Western Line rail corridor. A response to the issue of providing a connection to Western Sydney University is provided in Section 4.4.2.

The vertical alignment was developed to be in-tunnel between Western Sydney International and Bringelly to avoid a number of constraints including Badgerys Creek (and associated on-airport Environmental Conservation Zone), potential for flood impacts, areas of endangered ecological communities (including Cumberland Plain Woodland), local heritage items (including an area of Aboriginal archaeological heritage), private properties, potential difficulty in achieving safe and feasible road design at the interface with Derwent Road and Badgerys Creek Road, and ongoing development of master planning and land use outcomes for the future Aerotropolis Core precinct (the area to be called Bradfield).

A tunnel through this section was also considered to provide an opportunity to optimise the alignment between the Airport Terminal Station and Aerotropolis Core Station, improving the journey time for customers.

There is no space within the existing T1 Western Line corridor to accommodate a metro rail alignment. Section 6.5.1 of the Environmental Impact Statement describes how the design of St Marys Station has been influenced by a number of factors. The orientation and horizontal alignment has been optimised to:

- consolidate construction impacts on predominantly government-owned land and minimise private property acquisition and business impacts
- result in reduced environmental impacts, in particular to the fabric of the State Heritage listed elements of the station building and supporting structures
- be less disruptive during construction, including reduced impacts on local roads and reduced local community impacts (including reduced severance of the town centre and relatively less removal of existing at-grade car parking than would be required by comparison to other alignment options).

An in-tunnel east-west orientation of the project alignment in St Marys reduces acquisition impacts to residential properties at the surface and minimises the number of properties that the project runs underneath compared with a north-south alignment.

4.4.4 Western Sydney corridors

Submission identification number

SE-11746858.

Issue raised

A submitter queried why the gazetted corridor (under the Corridors SEPP) is required between Western Sydney Airport and Aerotropolis Core now that the project rail line is proposed underground.

Response

Section 6.8 of the Environmental Impact Statement states that while reduced property impacts and improved land use outcomes at Western Sydney International and the Aerotropolis Core precinct have been achieved due to the introduction of a tunnel alignment between these two locations, the land within the North South Rail Line Corridor remains protected by the Corridors SEPP for potential longer term transport infrastructure use, including the potential future East West Rail Link.

4.4.5 Stabling and maintenance facility

Submission identification number

SE-11496581.

Issue raised

A submitter queried whether the stabling and maintenance facility could be positioned on the eastern side of the metro rail alignment near the airport business park, so that future metro extensions connecting to Strathfield, Lidcombe and Cabramatta to airport business park can share such infrastructure.

Response

Section 6.7.1 of the Environmental Impact Statement describes the options analysis undertaken for the location of the stabling and maintenance facility for the project.

The site located to the south of Blaxland Creek, to the east of the project alignment and north of Patons Lane, was identified as preferred as it would:

- provide a relatively flat site with the lowest requirement for earthworks compared with the other options considered
- be the least constrained from an engineering and constructability perspective
- offer the most operational flexibility in comparison to the other options
- provide good utilisation of a parcel of land that would otherwise be between the proposed Outer Sydney Orbital Stage 1 corridor and the project alignment, and would therefore have limited redevelopment potential for other uses.

As detailed in Section 7.5.1 of the Environmental Impact Statement, the stabling and maintenance facility would provide space and initial preparatory landforming works for additional stabling roads to support the potential future extensions of the project and flood protection measures.

The suggested location for a stabling and maintenance facility to the eastern side of the airport business park is within the Western Sydney International site which is proposed to be developed as a major international airport (refer to Figure 19-8 and 19-9 of the Environmental Impact Statement). The development of a stabling and maintenance facility on this site would be incompatible with the long-term future development of the airport.

4.5 Project description – operation

4.5.1 Metro station design

Submission identification numbers

SE-11496581, SE-11752741, SE-11783278, SE-11176474.

Issues raised

Submitters raised the following issues about the design of metro stations:

- queried whether stations would be designed to provide shade and weather protection
- queried whether the project would provide wayfinding, tactile geographical indicator strips, ramps, audio described lifts with braille buttons, hearing loops, accessible toilets and parking
- queried whether bicycle parking would be provided at stations
- commented that the length of station platforms is not provided in the Environmental Impact Statement, and four-carriage station platforms would be sufficient with any added capacity in the future to be met by increased train frequency (rather than an increase in size of stations to cater for greater than four-carriage trains)
- suggested that a paid concourse area (similar to Central Station) should be provided at St Marys to enable a more convenient heavy rail/metro rail interchange.

Response

Section 7.4 of the Environmental Impact Statement provides an overview of the design drivers and key design elements for each of the proposed metro stations.

Adequate shelter would be provided at the stations. The Design Guidelines (Appendix D) provide direction for station design, and in accordance with these guidelines, metro station entrance plazas would be sheltered from the weather so customers can travel to their destination comfortably. Indicative layouts, elevations and artists impressions in Appendix B (Revised project description and performance outcomes and mitigation measures) show that the stations are to be designed to provide protection from the sun and rain.

The project would be designed to meet the operational performance outcomes for transport, which includes the requirement for stations and interchanges to be fully accessible and compliant with the Commonwealth *Disability Discrimination Act 1992* (Disability Discrimination Act) and the *Disability Standards for Accessible Public Transport* (Australian Government, 2002). Accessible parking spaces would be provided for commuters in accordance with the Disability Discrimination Act and to meet the *Disability Standards for Accessible Public Transport*. Section 7.3.2 of the Environmental Impact Statement also details common station elements that would be incorporated to each of the proposed metro stations, which would include signage and wayfinding.

The project involves new cyclist facilities as part of some of the station precincts. Secure bicycle parking would be provided at the off-airport stations.

As detailed in Section 7.7.1 of the Environmental Impact Statement, the project is being designed for potential ultimate service capacity of up to four carriages per train, and a frequency of up to 20 trains per hour during peak periods, therefore the stations are proposed to be built for this length of train.

An above-ground pedestrian connection to the existing St Marys Station would be provided for access between the metro and heavy rail stations (via escalators, stairs and lifts) and would also provide a connection to the area north of the existing T1 Western Line where customers can access the St Marys Commuter Car Park, which Transport for NSW is currently extending by two additional levels (see Section 6.8.6). Using this connection, customers would be able to easily transfer between metro, heavy rail, bus services and the St Marys Commuter Car Park.

4.5.2 Metro alignment and track infrastructure

Submission identification number

SE-11496581.

Issue raised

A submitter queried whether Sydney Metro would provide road and pedestrian overbridges at road crossings.

Response

As detailed in Section 7.1 of the Environmental Impact Statement, the project would be at surface level, in tunnel and elevated on viaduct (including over or as a road-over-rail bridge at key road and infrastructure interfaces) at different locations along the alignment.

Section 7.2.4 of the Environmental Impact Statement lists the viaduct and bridge sections that would be provided along the alignment, where the project does not preclude future opportunities for further road and pedestrian movement across the corridor as a result of future precinct planning.

At Lansdowne Road, the track alignment would be in-cutting and perpendicular to the existing Lansdowne Road. At this location, a new road-over-rail bridge would be provided as part of the Sydney Metro - Western Sydney Airport project to maintain the existing alignment of Lansdowne Road over the rail track. The road-over-rail bridge would include pedestrian access over the bridge, and also be designed so it does not preclude future provision of other pedestrian connections along Lansdowne Road.

There would also be viaduct structures to cross Patons Lane, an unnamed tributary of South Creek to the south of Patons Lane and Luddenham Road. The viaduct structures would be designed so they do not preclude future provision of pedestrian connections along these roads and the creek corridor.

At the future M12 Motorway about one kilometre north of Elizabeth Drive, the project would be separated on a new rail-over-road bridge with the future M12 Motorway located in a cutting under the metro rail line, which would be at surface. The bridge would be designed to provide the required clearance to the future M12 Motorway. Provision for pedestrian and cyclist access would be considered along the M12 Motorway alignment as part of the future M12 Motorway project design.

At the point where the project crosses Elizabeth Drive, the project would be at surface level under a new elevated alignment of Elizabeth Drive. This elevated structure is proposed to be delivered as part of the future M12 Motorway project. Provision of pedestrian and cyclist access would be considered along Elizabeth Drive as part of the future M12 Motorway project design.

Beyond the instances described above, there is no provision for road or pedestrian overbridges across the project alignment. However, strategic planning for the Western Sydney Aerotropolis and for other transport infrastructure projects (e.g. future M12 Motorway) are considering the need to provide improved active transport linkages. This strategic planning is outside of the scope of the Sydney Metro – Western Sydney Airport project.

4.5.3 Precinct and interchange development

Submission identification number

SE-11774024

Issues raised

A submitter raised the following:

- concern there is a planning misalignment for Sydney Science Park with regard to the orientation and layouts of roads and intersections with Luddenham Road
- recommended further refinement of the transport design integration within Sydney Science Park including internal roads and opportunities to ensure high quality walking and cycling connectivity
- requested further information regarding the proposed bus layover area to the south of Luddenham Station
- requested clarification of the internal bus routes through Sydney Science Park to ensure street layouts can be designed appropriately

- concern the proposed modifications to Luddenham Road do not align with proposed road connections outlined in Penrith Council's Development Control Plan 2014 and the Western Sydney Planning Partnership Precinct Plans
- recommended consultation with Sydney Metro to resolve the precinct and interchange development details
- recommended more than 60 bike parking spaces is provided
- concern that the proposed station entry on the northern side of the above ground station platforms at Luddenham Road Station would be immediately adjacent to the main vehicular route for the wider precinct presenting a construction vehicle hazard.

Response

The Luddenham Road Station precinct plan shown Figure 7-23 of the Environmental Impact Statement shows an indicative road layout in relation to Luddenham Road and a note that this design is subject to design development. This design development would be undertaken in consultation with key stakeholders responsible for the wider precinct and transport network development including Transport for NSW and the Western Sydney Planning Partnership.

Section 7.3.3 of the Environmental Impact Statement outlines the project and Sydney Metro's responsibility for delivering the proposed stations, station interchanges and station precincts. There is a range of different stakeholders who would have a role in delivering safety and place outcomes across the project corridor and at station precincts. At all off-airport stations, Sydney Metro would deliver public domain elements and work with other parts of Transport for NSW and other key stakeholders to deliver transport integration elements. This includes the NSW Centre for Road Safety who provides expert advice on road safety risks and the integration of station precincts with the wider network, including safe access for pedestrians and cyclists.

Sydney Metro is committed to continue to work with stakeholders such as Penrith City Council, the Western Sydney Planning Partnership and relevant landowners to work towards delivering a consistent precinct vision including public domain elements and transport integration with the Sydney Science Park and station precinct.

Mitigation measure OT1 outlines that interchange access plans would be prepared, in consultation with the Traffic and Transport Liaison Group and relevant authorities, to ensure adequate pedestrian and cycle facilities and other transport interchange infrastructure is provided at each station precinct. Interchange access plans to be prepared for the project would detail bus routes through the station precinct.

Mitigation measure OT2 also requires the project to be designed such that access to properties and existing infrastructure neighbouring the proposed stations would be maintained.

Sydney Metro would continue to consult with key stakeholders and affected landowners during design development regarding the alignment of proposed access roads and location of proposed intersections with Luddenham Road. A new mitigation measure (OLU2) requires Sydney Metro to continue to consult with key stakeholders during design development of the station interchanges and precincts.

Provision of 60 bike parking spaces is considered an adequate provision. The number of bike parking spaces to be provided would be confirmed during design development.

4.5.4 Viaduct design

Submission identification number

SE-11774024

Issues raised

A submitter requested further information regarding how space under the rail corridor viaduct would be activated and recommended:

- safe and useable spaces under the viaduct that provide easy connectivity and permeability across the corridor
- locations of the viaduct columns be located so as to minimise impacts on the surrounding area
- consideration of the finished levels of Luddenham Road in relationship to the viaduct upon completion of the project

Response

As described in Chapter 7 (Project description – operation) of the Environmental Impact Statement, the description of the project components presented in this chapter is indicative and based on the current level of design. Some design elements of the project would continue to be refined as part of the design development process, including optimising the space under the rail corridor viaduct. This refinement would be subject to ongoing consultation with key stakeholders and relevant landowners.

The design and planning principles that have informed the development of the Luddenham Road Station precinct are detailed in Section 2.3 of the Design Guidelines (Appendix D). This includes urban design strategies that include provision of active transport links and landscape design under or adjacent to the viaduct.

4.5.5 Metro operations

Submission identification number

SE-11496581.

Issue raised

A submitter queried if persons travelling to and from the airport with multiple luggage loads will have control to delay the closing of metro train doors.

Response

Section 7.5.4 of the Environmental Impact Statement provides an overview of the signalling systems and train control for the project. The signalling system would control the stopping of trains at stations and the opening and closing of train and platform screen doors. The project will take into consideration passengers with luggage through suitable dwell times (the time the train remains with its doors open) at key locations such as St Marys Station and Airport Terminal Station.

4.6 Project description – construction

4.6.1 Construction program

Submission identification number

SE-11788120.

Issue raised

A submitter queried when proposed construction areas on the landholding are required to be vacated.

Response

Sydney Metro would consult with the affected landowners where land would be acquired for construction of the project. Details of timing for the acquisition would be discussed with the affected landowner. An indicative construction program for the off-airport construction corridor (the construction site which is partially located on the submitters property) is provided in Figure 8-17 of Chapter 8 (Project description – construction) of the Environmental Impact Statement.

4.7 Transport

4.7.1 Transport assessment methodology

Submission identification number

SE-11774024

Issues raised

A submitter raised the following comments:

- land use projections used for the traffic modelling may be outdated and not aligned with forecasts outlined in recent policy documents and recommends the modelling assumptions are updated to current land use scenarios
- the operational traffic assessment does not clarify if movements to/from the bus layover are considered in the assessment and the assessment does not appear to consider the potential multi-storey car parking facility in 2036 and how this could impact road network performance

- the preliminary station demand forecasts are too low and need to be flexible to allow for higher capacity
- requests clarification on what land use forecasts were used to inform station demand forecasts.

Response

The traffic modelling undertaken as part of the Environmental Impact Statement was based on the WestConnex Road Traffic Model (WRTM) outputs prepared for the M12 Motorway Environmental Impact Statement obtained in July 2019 as this was the current data available at the time.

As part of the *M12 Motorway Amendment Report* WRTM model updates have been undertaken using updated land use and demographics data based on 2016 land use forecasts. Initial review of the amended WRTM outputs indicate that forecast future year traffic volumes for 2026 and 2036 are lower than those used in the Sydney Metro – Western Sydney Airport Environmental Impact Statement, which were based on 2014 land use forecasts by the Department of Planning, Industry and Environment. As such, the assessment prepared for the project is considered a conservative assessment.

Movements from the bus layover and commuter car park of up to 200 spaces have been incorporated into the operational traffic assessment. If a future expansion of the commuter car park is determined to be required, this would be subject to a further assessment and approval process. Section 5.1.2 of Technical Paper 1 – Transport outlines the transport provisions at each off-airport station precinct.

The project would be designed to meet the performance outcomes as outlined in Table 7-1, requiring that each station and station plaza is provided with sufficient customer capacity to achieve a minimum level of service for 2056 forecast demands.

4.7.2 Road traffic impacts in Orchard Hills

Submission identification number

SE-12354298.

Issue raised

A submitter raised concern about traffic impacts on their property along Samuel Marsden Road in Orchard Hills.

Response

Discussion of potential construction and operational road traffic impacts in this area are provided in Sections 9.5.1 and 9.6.1 of the Environmental Impact Statement, respectively. Construction traffic from this part of the off-airport construction corridor would travel along the rail corridor south of Lansdowne Road and connect to the road network via Lansdowne Road to Kent Road and then to the M4 Western Motorway. Construction and operational traffic from the stabling and maintenance facility is proposed to be via Patons Lane to Luddenham Road. Operational traffic to and from Orchard Hills Station would also use Kent Road, Lansdowne Road, and the new precinct roads. No construction traffic is anticipated to use Samuel Marsden Road.

The project would provide the following road upgrades in the vicinity of Samuel Marsden Road during operation:

- an upgrade and likely signalisation of the intersection of Lansdowne Road and Kent Road and the provision of a new signalised crossing at the intersection of Kent Road and the future Orchard Hills Station precinct street
- a signalised crossing at Kent Road to permit vehicle movements into the station precinct.

These upgrades may include provisions for an additional approach, pedestrian and bicycle crossings and potential bus priority. The proposed changes emphasise the need to maintain reliable traffic access to and from the M4 Western Motorway.

The approach to transport and traffic management during the construction phase, including the process for the development of all construction traffic management plans, is outlined in the Construction Traffic Management Framework (Appendix G of the Environmental Impact Statement).

4.7.3 Parking impacts during construction

Submission identification number

SE-10716923.

Issue raised

A submitter raised concern over construction worker vehicle parking during construction in St Marys, stating that if workers require parking along Camira Street, St Marys this would contribute to traffic congestion.

Response

An assessment of parking impacts during construction is provided in Chapter 9 (Transport) of the Environmental Impact Statement and identifies that some construction worker parking would be provided at construction sites, although it would not meet the expected full demand based on indicative workforce numbers. The Construction Traffic Management Framework (Appendix G of the Environmental Impact Statement) sets out the approach to managing construction worker parking for the project.

A new mitigation measure (T9) is proposed which would require a construction worker car parking strategy to be prepared specifically for St Marys, in consultation with Penrith City Council and Transport for NSW. The strategy would consider measures to reduce impacts from construction worker parking along local streets within St Marys, such as Camira Street. Measures identified in the strategy to reduce construction worker parking impacts may include:

- investigating options for parking within the construction compounds
- encouraging the use of public transport, ride sharing and active transport for workers travelling to and from site
- using shuttles to transport workers from other construction sites (for example, Claremont Meadows and Orchard Hills construction sites), where practicable.

4.7.4 Parking impacts during operation

Submission identification number

SE-10716923.

Issue raised

A submitter raised concern over parking impacts during operation in St Marys, stating that:

- there does not appear to be sufficient parking in and around the proposed St Marys Station on the south side
- long term customers of the metro will park for extended periods of time along Camira Street and as Camira Street is narrow, it would not be possible for traffic to flow in either direction if parking is allowed.

Response

Parking impacts during operation of the project are discussed in Chapter 9 (Transport) of the Environmental Impact Statement.

As outlined in Section 9.5.1 of the Environment Impact Statement, the car parking survey undertaken by Sydney Metro in 2019 indicates there is existing on-street and off-street capacity within the town centre at St Marys (within 400 metres of affected spaces) to help manage impacts to parking from the project.

At St Marys additional parking would also be provided by extending the existing multi-level commuter car park on Harris Street by two additional levels (as outlined in Section 6.8.6) and is proposed to be in place prior to the removal of the Harris Street at-grade commuter car park. These spaces would help manage impacts to parking from the project, with an overall increase of around 120 commuter parking spaces in the area. An above-ground pedestrian connection would be provided for access between the metro and heavy rail stations (via escalators, stairs and lifts) and would also provide a connection to the area north of the existing T1 Western Line, including the extended commuter car park.

A new mitigation measure (OT4) is proposed which would require that an operational car parking strategy be prepared in consultation with Penrith City Council and Transport for NSW prior to commencement of operation. The strategy would include consideration of measures that could be implemented to address any parking impacts as a result of the project.

Transport interchange provisions are proposed at St Marys Station, including point-to-point and kiss-and-ride facilities and secure bicycle parking. The combined effects of the provision of the metro service, increases in the number of bus services and enhancements to the walking and cycling facilities are likely to reduce car dependency and minimise the parking and traffic impacts in St Marys.

4.7.5 Access to Sydney Science Park

Submission identification number

SE-11774024

Issues raised

A submitter raised the following comments regarding access to Sydney Science Park:

- Sydney Science Park construction is planned to start in 2021 and assurance is needed that current access from Luddenham Road will be maintained during construction and operation of the project
- concerns the proposed metro alignment and bus layover location impacts the existing Sydney Science Park road access required for construction and operational access
- recommended further consultation regarding potential access impacts on Sydney Science Park off Luddenham Road.

Response

The operational layout at Luddenham Road Station is subject to further design development, and the project would be designed to meet the performance outcomes listed in Table 7-1, which include the following requirements to ensure the project design considers safe integration with the surrounding environment including future land uses and development:

- accessibility and connectivity between future communities is supported by the project through opportunities to integrate with key project components such as stations
- safe access to properties and businesses is maintained during construction, unless alternatives are agreed with property owners and businesses.

Mitigation measure OT2 also requires the project to be designed such that access to properties and existing infrastructure neighbouring the proposed stations would be maintained.

Sydney Metro would continue to consult with key stakeholders and affected landowners, during design development to manage potential access impacts. A new mitigation measure (OLU2) requires Sydney Metro to continue to consult with key stakeholders during design development of the station interchanges and precincts.

4.7.6 Commuter car parking at Luddenham Road Station

Submission identification number

SE-11774024

Issues raised

A submitter raised the following comments:

- Sydney Metro should ensure the best outcome of uses surrounding and complementing the commuter car park at Luddenham Road Station
- concern that traffic generated by the commuter car park and bus layover may cause congestion on the local Sydney Science Park road network and decrease local and town centre amenity
- providing free commuter car parking facilities may deter Sydney Metro customers who drive to the proposed Luddenham Road Station from using the local bus network
- recommended Sydney Metro further consider the location and ultimate function of the commuter car park and bus layover at Luddenham Road Station.

Response

Section 2.3 of the Design Guidelines (Appendix D) highlight the design and planning principles which have informed the development of the Luddenham Road Station precinct layout. The final transport integration provisions at Luddenham Road would be subject to ongoing design development and consultation with relevant stakeholders.

Mitigation measure OT1 requires that interchange access plans would be prepared, in consultation with the Traffic and Transport Liaison Group, to ensure adequate pedestrian and cycle facilities and other transport interchange infrastructure is provided at each station precinct.

4.7.7 Transport mitigation measures

Submission identification number

SE-11774024

Issues raised

A submitter raised the following:

- concern that no mitigation measures are proposed to manage roads forecast to operate at their theoretical capacity due to the increase in background traffic demand, specifically on Luddenham Road for access to Sydney Science Park
- recommended appropriate mitigation measures to achieve acceptable levels of service considering the cumulative impacts of the project and operational traffic forecast for Sydney Science Park.

Response

Section 9.6.1 of the Environmental Impact Statement outlines that the predicted traffic volumes in 2026 (year of opening) and 2036 (10 years after opening) along Luddenham Road indicate that the project would result in a relatively small increase in traffic on the road network in both the AM and PM peaks. Station precinct access to Luddenham Road would be designed with adequate capacity and to allow the safe movement of traffic to and from Luddenham Road.

The requirement to widen Luddenham Road would be driven by the wider development occurring as part of the Aerotropolis and the Northern Gateway precinct and is outside of the scope of the project. Sydney Metro would design the viaduct over Luddenham Road so as not to preclude any future road upgrades.

4.8 Noise and vibration

4.8.1 Noise and vibration assessment

Submission identification number

SE-12354298.

Issue raised

A submitter raised concern that the Environmental Impact Statement has not assessed the noise impacts of their property along Samuel Marsden Road.

Response

Potential noise impacts during construction and operation of the project have been assessed in Sections 10.5 and 10.6 of the Environmental Impact Statement respectively.

The submitter's property is located in Noise Catchment Area (NCA) 08. Construction noise impacts for a range of construction scenarios in this NCA are detailed in Section 4.5 and Appendix B.4 of Technical Paper 2 – Noise and vibration.

The highest construction noise expected at this property is as a result of the use of hydraulic hammers during station and portal excavation works at Orchard Hills. The hydraulic hammers are expected to be used intermittently for around eight months during the construction period.

Construction noise would be managed in accordance with the Construction Noise and Vibration Standard (Appendix F) and the performance outcomes and mitigation measures identified for the project. A Construction Noise and Vibration Management Plan would be prepared in accordance with

the Construction Noise and Vibration Standard, and would include confirming the identified noise sensitive receivers. Detailed Construction Noise and Vibration Impact Statements will be prepared for noise-intensive construction sites and /or activities to ensure the adequacy of the noise and vibration mitigation measures.

Operational rail noise impacts from the rail corridor are assessed in Section 5.5 and Appendix D.1 of Technical Paper 2 – Noise and vibration. The operational rail noise levels are predicted to comply with the relevant *Rail Infrastructure Noise Guideline* (EPA, 2013) noise trigger levels at all noise sensitive receiver locations. A performance outcome for the project requires operational noise and vibration levels from rail operations to be managed in accordance with the *Rail Infrastructure Noise Guideline* and Airports Regulations. Operational noise levels for the stabling and maintenance facility, stations and other fixed infrastructure would be managed in accordance with the *NSW Noise Policy for Industry* (EPA, 2017a).

Operational noise impacts from the stabling and maintenance facility are assessed in Section 5.7 and Appendix F of Technical Paper 2 – Noise and vibration. Exceedances of the applicable trigger levels by up to eight decibels (dB) are predicted for receivers in NCA 08 to the west of the stabling and maintenance facility. However, the applicable noise criteria is anticipated to be achieved for receivers to the north of the stabling and maintenance facility located along Samuel Marsden Road.

Mitigation measure ONV1 requires that an Operational Noise and Vibration Review would be prepared during design development to confirm the measures required to manage airborne noise impacts from the stabling and maintenance facility. The Operational Noise and Vibration Review would consider existing and potential future land use to establish project noise trigger levels.

For the stabling and maintenance facility, the most effective method for managing noise impacts at receivers during operation would be to mitigate the noise (i.e. air compressors, air conditioning and static converters) at source. Other measures such as introduction of shielding through site reconfiguration or construction of a noise barrier between source and receiver may be considered as part of design development and would be guided by the Operational Noise and Vibration Review.

4.8.2 Noise and vibration impacts during construction

Submission identification numbers

SE-10716923, SE-11746858.

Issues raised

Submitters raised concern about noise and vibration impacts during tunnelling construction works, including:

- concerns about vibration impacts along Camira Street in St Marys during tunnelling works, stating that excessive vibration would have impacts on the structural integrity of their home
- concerns about noise and vibration impacts from tunnelling works required for the Western Sydney International to Bringelly tunnel.

Response

Potential construction vibration impacts are discussed in Section 10.5 of the Environmental Impact Statement. The vibration levels from the TBM have been predicted for each sensitive receiver and are presented in Figure 4-51 and Figure 4-52 of Technical Paper 2 – Noise and vibration for the St Marys to Orchard Hills and Western Sydney International to Bringelly tunnels respectively.

Ten residential receivers located above the St Marys to Orchard Hills tunnel are predicted to be above the maximum vibration level targets, above which there is considered to be a risk that the amenity and comfort of people occupying buildings would be adversely affected. These receivers are all located on Camira Street, St Marys. In addition, six residential receivers above the Western Sydney International to Bringelly tunnel, are predicted to experience vibration levels between the preferred and maximum management targets. These are located along Derwent Road and Badgerys Creek Road, Bringelly.

The duration of potential vibration target exceedances from the TBMs is expected to be limited to around three to four nights for receivers closest to the tunnel alignment. As the tunnelling works progress and move away, a particular receiver's exposure to ground-borne noise and vibration would reduce accordingly.

The project would be designed to meet the operational performance outcomes for noise and vibration, requiring that construction noise and vibration impacts on sensitive receivers (including ground-borne noise and vibration) would be managed in accordance with the Sydney Metro Construction Noise and Vibration Standard (Appendix F) and the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009). Mitigation measure ONV1 also requires preparation of an Operational Noise and Vibration Review during design development to confirm the mitigation measures required to manage ground-borne noise impacts from rail operations, among other impacts.

Where vibration impacts are identified as exceeding targets as a result of construction activities, a Detailed Noise and Vibration Impact Statement or General Noise and Vibration Impact Statement report, specifically in relation to the assessment of construction vibration, would be undertaken. The Noise and Vibration Impact Statements would clearly indicate which mitigation measures have been/are to be incorporated into the calculations for the noise assessment. This allows consideration of residual impacts.

The purpose of Noise and Vibration Impact Statements are to provide more detailed predictions of noise and vibration impacts when compared to the potential construction scenarios considered in the Environmental Impact Statement. To achieve this, they would be undertaken prior to construction by contactors who are in control of the activity or location. The Construction Noise and Vibration Impact Statements ensure that accurate impacts are defined, NMLs are achieved wherever possible, works scheduling is considered and sensitive receivers are aware of the approach to minimising impacts upon them.

As detailed in Section 6.5 of the Construction Noise and Vibration Standard (Appendix F), if construction activities have the potential to cause damage through vibration to nearby public utilities, structures, buildings and their contents, an existing condition inspection of these items will be undertaken except where a planning approval specifies an alternate process. The Construction Environmental Management Framework (Appendix E) also includes provisions requiring the offer of pre-construction building condition surveys to owners of buildings where there is a potential for construction activities to cause any damage.

4.8.3 Noise and vibration impacts during operation

Submission identification number

SE-10716923.

Issue raised

A submitter raised concerns about noise and vibration impacts during operation along Camira Street in St Marys.

Response

Ground-borne noise and vibration from metro trains operating within the tunnels is assessed in Section 10.6 of the Environmental Impact Statement. Ground-borne noise can be generated by vibration transmitted through the ground and into a structure from the operation of railways. Ground-borne noise and vibration has the potential to adversely impact amenity and comfort of people occupying buildings. Up to 12 residential receivers are predicted to experience noise levels higher than the project noise trigger level at the northern end of the St Marys to Orchard Hills tunnel adjacent to St Marys Station (assuming a standard attenuation track form). This can be attributed to the proximity of buildings to the rail alignment, and includes properties along Camira Street. As part of design development measures to mitigate potential ground-borne noise impacts would be developed with the objective of meeting required ground-borne noise trigger levels.

During operation, the airborne rail noise levels are predicted to be less than the relevant *Rail Infrastructure Noise Guideline* noise trigger levels at all existing noise sensitive receiver locations, including in St Marys. Noise from operational plant and machinery associated with St Marys Station (e.g. underground ventilation shafts) is also not predicted to exceed project target noise levels for residents along Camira Street.

The project would be designed to meet the operational performance outcomes for noise and vibration, including the requirement for operational noise and vibration levels from rail operations to be managed in accordance with the *Rail Infrastructure Noise Guideline* and Airports Regulations.

Mitigation measure ONV1 also requires that an Operational Noise and Vibration Review would be prepared during design development to confirm the measures required to manage airborne and

ground-borne noise impacts from rail operations and airborne noise impacts from fixed industrial sources, including stations and services facilities.

4.9 Biodiversity

4.9.1 Impacts on native vegetation and riparian corridors

Submission identification number

SE-10992845.

Issue raised

A submitter raised the following issues about native vegetation and riparian vegetation impacts at the DEOH site and the stabling and maintenance facility:

- concern that grassland communities on the DEOH site have been inadequately assessed and categorised as pasture grass, stating that it is native grassland protected under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and that it should be retained to provide sufficient bird foraging habitat
- request for further clarification on the layout of the stabling and maintenance facility as it is unclear in the Environmental Impact Statement, meaning they cannot understand impacts on trees at the DEOH site
- recommendation to extend the northern tunnel alignment to avoid impacts on native vegetation and riparian land associated with Blaxland Creek
- request that the project ensures minimum impacts on riparian vegetation and that there is adequate provision for fauna to move freely under the rail line for foraging and existence.

Response

The DEOH land contains areas of remnant native vegetation (in the form of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest) and historically cleared areas of grasslands, comprising of areas of exotic dominated grassland and areas of native dominated derived grassland. The Revised Biodiversity Development Assessment Report for the project (Appendix G) has mapped the vegetation within these areas following detailed field verification surveys in accordance with NSW Biodiversity Assessment Method (BAM). This updated mapping confirmed the presence of both exotic grassland areas and derived native grasslands and the assessment has considered these grasslands in accordance with BAM.

The project would have a direct impact of up to approximately 7.3 hectares of native vegetation communities within the DEOH site in total, including:

- 4.79 hectares of the TEC Cumberland Plain Woodland (PCT 849) as listed under the BC Act and 1.21 hectares as listed under the EPBC Act
- 0.22 hectares of the TEC River-flat Eucalypt Forest (PCT 835) as listed under the BC Act
- 2.29 hectares of the TEC Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland (PCT 1800) as listed under the BC Act and 1.85 hectares of as listed under the EPBC Act.

The removal of vegetation outlined above would be a worst-case impact and opportunities throughout design development and construction management would aim to minimise these impacts. The majority of impacts on vegetation in this area are associated with small fragmented areas of disturbed condition vegetation and/or fringing edges of intact condition areas. The removal of this vegetation is considered unlikely to cause a substantial loss of significant habitat features (including hollow bearing trees and native grasslands for the threatened Speckled Warbler) relative to the available habitats retained within the DEOH site and adjoining areas of Blaxland Creek.

The location and indicative layout plan for the stabling and maintenance facility has been identified in Figure 7-39 of the Environmental Impact Statement. All existing vegetation within this site would likely be removed as earthworks are required across the site to manage drainage and minimise potential flooding impacts. However, in accordance with revised mitigation measure FF1, the Flora and Fauna Management Plan for the project would detail how the clearing of native vegetation and habitat would be minimised where possible, for example by seeking to locate site offices, site compounds and

ancillary facilities in areas where there are limited biodiversity values (e.g. cleared land) and by delaying the removal of vegetation until absolutely necessary. Residual impacts that are not able to be avoided or managed through mitigation measures would be offset for both TECs (ecosystem credits) and threatened species (species credits).

Biodiversity credits measure the loss in biodiversity values at a development, activity, clearing or biodiversity certification site and the gain in biodiversity values at a biodiversity stewardship site (BSA). Credits are generated on a BSA from management actions that improve biodiversity values on lands secured for conservation. These credits can be used (retired) to compensate for residual impacts on biodiversity values on development sites.

Biodiversity credit types include ecosystem and species credits. These are defined as:

- ecosystem credits: a measurement of the value of TECs, threatened species habitat for species that can be reliably predicted to occur with a PCT, and PCTs generally
- species credits: the class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates.

Chapter 12 of the Revised Biodiversity Development Assessment Report (Appendix G) provides further details on the biodiversity offset strategy for the project.

Regarding the extension of the northern tunnel further south, the vertical alignment was informed by a range of natural constraints, existing or planned infrastructure and property constraints throughout the corridor. Section 6.6.2 of the Environmental Impact Statement discusses the constraints that influenced the vertical alignment for the project and a summary of the vertical alignment options considered for this project location. This options analysis focused on avoiding and minimising potential biodiversity impacts where possible, and a combination of tunnel and viaduct structures are proposed to reduce impacts on areas of riparian vegetation and endangered ecological communities. The alignment has specifically considered the minimisation of impacts on Blaxland Creek and the unnamed creek within the DEOH site by including viaduct sections to cross the creeks.

The alignment returns to surface as it travels south to avoid key constraints including the 330kV and 500kV power lines and to provide a preferred at-surface entry arrangement to the stabling and maintenance facility (see Section 6.7.1 of the Environmental Impact Statement). The proposed construction strategy for the project and construction efficiency was also considered in the assessment of alignment options. As a result of these constraints, the project alignment is a mixture of tunnel, in-cutting, elevated/ viaduct, and surface.

The project would be designed to meet the operational performance outcomes for biodiversity, including the requirement that culverts and bridges would be appropriately sized to maintain fauna habitat connectivity, and that the project would be designed to include rail corridor fencing to minimise wildlife-train collision, while providing opportunities for wildlife movement.

A new mitigation measure (OFF2) has been added which notes that the design of viaduct structures over the wildlife/riparian corridors at Blaxland Creek, the unnamed tributary of South Creek to the south of Patons Lane and Cosgroves Creek would seek to:

- maximise the span over the wildlife/riparian corridor
- minimise native vegetation removal within the wildlife/riparian corridors
- maintain opportunities for fauna movement along the wildlife/riparian corridors
- provide opportunities to enhance fauna movement where possible.

4.10 Flooding, hydrology and water quality

4.10.1 Flooding impacts

Submission identification numbers

SE-11496581, SE-11737087.

Issues raised

Submitters raised concerns about the potential flooding impacts of the project, including:

- how the project will manage flooding

- flooding impacts for residences and workers during construction in south St Marys
- flooding impacts on flood-prone residential areas in south St Marys during operation, including in the South Creek floodplain, Great Western Highway and in the vicinity of the stabling and maintenance facility – including the suggestion that upgraded drainage systems should be provided in this area to protect residents
- flooding impacts on rail tunnels during heavy rainfall events.

Response

Chapter 14 (Flooding, hydrology and water quality) of the Environmental Impact Statement provides a summary of how the project has been designed to mitigate flooding impacts and an assessment of flooding impacts during construction and operation of the project. The project would be designed to meet the performance outcomes for hydrology and flooding, which require that critical infrastructure, including station entries and tunnel portals, are designed to have immunity against the probable maximum flood event.

Temporary changes to the local flooding regime may occur during construction due to the temporary blockage of flow paths and increased flow rates due to vegetation clearing. Further investigation and modelling would be carried out during design development and appropriate arrangements would be in place to manage any flood events should they occur during either construction or operation. The project is in tunnel between St Marys and Orchard Hills and would have no impact on flood conditions in the south St Marys area.

During operation, the project has the potential to increase peak flood levels in isolated locations, such as around Blaxland Creek and at the proposed stabling and maintenance facility (refer to Section 6.1 of Technical Paper 6 – Flooding, hydrology and water quality). Opportunities to mitigate these impacts would be investigated during further design development (for example, additional earthworks or providing additional flow widths). Mitigation measure OHYD1 has been updated to require that the flood model for the project be updated with regard to flood modelling undertaken for the South Creek Sector Review (anticipated to be released in 2021) and would include updated calibration and validation. A draft was released in 2020 which has been considered by Sydney Metro and the final flood modelling from this review is anticipated to be released in 2021. A preliminary review of the draft documents indicates that changes in the catchment as a result of the modelling updates are anticipated to be minor in the vicinity of the project and would not be a trigger for substantial changes to the design. The updated flood modelling would be used to inform further design development.

4.11 Groundwater and geology

4.11.1 Ground movement impacts during construction

Submission identification numbers

SE-10716923, SE-11746858.

Issues raised

Submitters raised concerns about ground movement impacts during construction, including that tunnelling works would:

- impact foundations and structural integrity of homes along Camira Street in St Marys
- result in ground disturbance during construction of the Western Sydney International to Bringelly tunnel.

Response

A preliminary assessment of the potential impact to existing buildings and structures as a result of ground movement arising from the construction of the project was carried out and summarised in Section 15.5 of the Environmental Impact Statement using the Rankin (1988) risk classification. This assessment has been updated and summarised in Chapter 6 (Environmental Impact Statement clarifications).

The project would be designed to meet the performance outcomes for groundwater and geology, which include the requirement for structural damage to buildings, heritage items and public utilities and infrastructure from ground movement to be avoided.

Almost all building lots assessed for potential ground movement in the vicinity of the St Marys to Orchard Hills and Western Sydney International to Bringelly tunnels are assessed as being within either the 'negligible' or 'slight' risk categories based on Rankin (1988).

For the St Marys to Orchard Hills tunnel, the maximum predicted ground movement associated with construction of the twin tunnels was five millimetres or less for the majority of the tunnel lengths. Where the tunnels approach St Marys Station around Camira Street the ground movement at the surface is expected to be within the 5 to 10 millimetre range which is in the negligible risk category for buildings and structures using the Rankin (1988) risk classification. Where the tunnels interface with the St Marys Station the ground movement is expected to be higher. For the Western Sydney International to Bringelly tunnel, the maximum predicted ground movement from construction of the twin tunnels south of Badgerys Creek is expected to be within the 5 to 10 millimetre range which is in the negligible risk category for buildings and structures using the Rankin (1988) risk classification. Where the tunnels interface with the Aerotropolis Core Station and Bringelly services facility the ground movement is expected to be higher.

Mitigation measure GW1 requires further assessment to be undertaken during design development, and prior to construction commencing, to ensure that damage to buildings and structures at risk of ground movement impacts around St Marys, Claremont Meadows, Orchard Hills and Bringelly are avoided or managed. Where building damage risk is rated as slight, moderate or high (as per Rankin 1988), a structural assessment of the affected buildings/structures would be carried out and specific measures implemented to address the risk of damage. If ground movement impacts are predicted to exceed acceptable criteria for buildings, heritage assets, road and rail infrastructure or utilities then a range of potential options are available to reduce impacts to acceptable levels including:

- changes to elements of the construction methodology
- consideration of ground improvement options
- provision of structural support to the tunnels/excavations and/or to the structures potentially impacted
- ground movement monitoring for identified sensitive areas of the project.

The Construction Environmental Management Framework (Appendix E) includes provisions requiring the offer of pre-construction building condition surveys to owners of buildings where there is a potential for construction activities to cause any damage.

These options have been successfully implemented to manage ground movement impacts on a number of other rail and road tunnelling projects in NSW.

4.11.2 Ground movement impacts during operation

Submission identification number

SE-11746858.

Issue raised

A submitter raised concern about long-term ground disturbance impacts of the project on their house and other structures on their land, specifically due to the Western Sydney International to Bringelly tunnel which travels very close to their property.

Response

Section 15.6 of the Environmental Impact Statement provides an assessment of the groundwater and geology impacts during operation of the project, and predicts that no ground movement impacts during operation are anticipated.

All stations, services facilities and tunnel portal structures for the project would be undrained (tanked) during operation. Groundwater inflow to these structures (which could otherwise result in reduced pressure and stability of soil structure causing ground settlement at the surface) would be prevented due to waterproofing, and groundwater levels that were lowered during construction would recover slowly.

4.12 Sustainability, greenhouse gas and climate change

4.12.1 Reuse and recycling targets

Submission identification number

SE-11496581.

Issue raised

A submitter asked how much reused, recycled and recyclable products would be used for the project.

Response

Potential project-wide sustainability objectives have been identified in Table 17-1 of the Environmental Impact Statement, for inclusion in the project's Sustainability Plan.

These sustainability objectives include targets and initiatives for reuse and recycling and would be integrated into the design, construction and operation of the project, following confirmation during further design development.

Opportunities to use recycled products would be identified and prioritised during detailed design, where they are able to meet performance and durability requirements. The majority of materials that would be used for the project (concrete and steel) are for infrastructure with a more than a 100 year design life, and are readily recyclable.

Examples of some reuse and recycling-related initiatives identified in the Environmental Impact Statement include:

- target 95 per cent construction and demolition waste recycling
- optimise operational efforts for waste collection and recycling
- implement a variety of waste collection streams including comingled recycling and general waste
- minimise the embodied impacts of concrete through the adoption of lower carbon alternatives
- minimise the embodied impacts of steel through maximising the use of recycled steel and steel produced using energy-reducing processes
- identify and implement best practice low-impact alternative materials in the construction supply chain including recycled materials and engineered timber
- undertake lifecycle assessments and minimise the embodied impacts of materials, through the selection of low carbon alternatives and considering durability and local sourcing
- prioritise products made from recycled content.
- 100 per cent beneficial reuse of usable spoil generated by the project, in accordance with the project spoil management hierarchy
- source timber products from either re-used timber, post-consumer recycled timber, Forest Stewardship Council or Programme for the Endorsement of Forest Certification certified timber suppliers where feasible
- prioritise local sourcing of materials, where feasible.

The volumes of other construction wastes (apart from spoil) are expected to be comparable to other infrastructure projects of similar type and scale so were not estimated as part of the Environmental Impact Statement. These construction waste volumes are expected to be manageable through the application of standard waste management strategies (addressing waste generation, storage, disposal and reuse) and the project-specific sustainability initiatives documented in Chapter 17 (Sustainability, climate change and greenhouse gas) of the Environmental Impact Statement.

4.13 Property and land use

4.13.1 Substratum acquisition

Submission identification numbers

SE-10716923, SE-11746858.

Issues raised

Submitters raised concerns about the impacts of substratum acquisition, including:

- further clarification required about how a monetary sum would be calculated for substratum acquisition
- concern that having a tunnel beneath their property would impact future property values and the possibility for future development on their property in St Marys.

Response

Sydney Metro gives consideration to developments with subsurface elements (e.g. basement car parks, pipelines) throughout the design development process for the underground corridor for the project. This is partly why, where possible, the underground corridor runs beneath major roads, open space or public buildings. Where the underground corridor runs beneath private property, potential impacts are assessed and addressed via the tunnel design process and/or proposed management measures. The proposed tunnel depth and alignment have been selected to minimise surface impacts, subject to considerations of customer amenity and interchange times at stations and other constraints such as soil conditions.

Sydney Metro will only acquire the land it needs to safely construct the tunnels and provide for their long-term protection. It would be necessary to acquire underground land for the construction of the tunnels once the tunnel alignment design is confirmed, following planning approval.

This subsurface layer (or substratum) would be an acquisition envelope around the tunnels, including an allowance for any rock anchors to enable safe construction and long-term protection of the tunnels. This is referred to as substratum acquisition and is undertaken in accordance with the NSW *Transport Administration Act 1988* (Transport Administration Act). Under the Transport Administration Act, compensation is not payable, except in very limited circumstances, where stratum is required for the development of underground infrastructure. Section 19.5 of the Environmental Impact Statement discusses the need for substratum acquisition for the project. Figure 19-11 of the Environmental Impact Statement illustrates how subsurface acquisition works.

Properties for which substratum acquisition is required would be identified as part of design development. A member of the project team would contact any affected property owners and further information would be provided at that stage.

Following approval of the project, development applications on land subject to substratum acquisition would be referred to Sydney Metro for concurrence so that Sydney Metro – Western Sydney Airport infrastructure is not impacted by future development activities. In most cases, subsurface acquisition does not affect the continued existing uses or intended future uses of property at the surface.

Subject to planning controls, obtaining Sydney Metro's concurrence (where required under relevant environmental planning instruments) and meeting the requirements of council, landowners would generally be able to excavate foundations for a new dwelling or for second storey additions or carry out improvements such as installing a swimming pool.

Property values are influenced by a number of complex factors including demand at a certain point in time, economic climate, general location, accessibility, traffic, noise, and proximity to transport infrastructure and other services. During operation, the project could provide economic benefits to residents in station catchments by providing increased public transport accessibility and employment connectivity.

4.13.2 Land severance and fragmentation

Submission identification number

SE-11788120.

Issue raised

A submitter raised concern about land use and fragmentation impacts on their landholding along Elizabeth Drive in Badgerys Creek, including whether road access will be able to be provided across the metro alignment. The submitter also raised concern that the construction footprint for the project is inconsistent with the gazetted rail corridor under the Corridors SEPP.

Response

Sections 19.5 and 19.6 of the Environmental Impact Statement provide an assessment of potential land severance and fragmentation a result of the project.

For the aboveground sections of the project, construction activities have the potential to physically divide areas through the establishment of site fencing and hoardings. This is particularly relevant for the surface sections of the project alignment from Orchard Hills to Elizabeth Drive, where it would be necessary to establish a linear construction worksite (the off-airport construction corridor, described in Section 8.7.4 of the Environmental Impact Statement). However, given the existing land use pattern and primary travel routes, this potential land use impact is likely to be minimal. In this area, agricultural operations may be potentially impacted during construction as a result of temporary changes in access to properties or farm infrastructure such as fencing near the construction footprint.

For properties where portions of land may be divided by a construction site, access may be temporarily affected. Access locations may also be required to move during the construction phase to ensure the safety of both landholders and contractors.

A new construction mitigation measure (LU3) has been added in response to the submissions received on this issue which requires consultation with affected property owners during construction to ensure access to potentially fragmented land parcels is maintained. Mitigation measure LU2 also requires that, where property adjustments have the potential to impact farm infrastructure (such as fencing and dams) or local access to properties, consultation with affected property owners would be carried out prior to these works occurring, in order to determine reasonable, feasible and acceptable solutions.

On completion of construction, a legal right of access below the rail alignment would enable private access and continued use of residue lands for the submitter's property. The location of access during operation would be negotiated with individual landholders.

A new operational mitigation measure (OLU1) has been added in response to the submissions received on this issue which outlines that where a property would be potentially fragmented by the rail corridor, access to properties would be provided. The location of access to be provided would be agreed in consultation with the landowner.

The future M12 Motorway corridor is also to be located in this area. The potential cumulative impacts of the project and the future M12 Motorway including land fragmentation are assessed in Chapter 24 (Cumulative impacts) of the Environmental Impact Statement and this issue is responded to in Section 4.17. Mitigation measure CL1 requires the development of a Cumulative Construction Impacts Management Plan to detail coordination and consultation with stakeholders (as relevant) to manage the interface of projects under construction at the same time.

Table 6-10 of the Environmental Impact Statement describes how the project was developed to minimise impacts outside of the North South Rail Line corridor, which is gazetted (along with other corridors and future extensions) under the Corridors SEPP. The project would predominantly follow the gazetted North South Rail Line corridor between south of Orchard Hills and the Aerotropolis. Supporting infrastructure such as the stabling and maintenance facility, construction sites and operational systems would be located outside of the North South Rail Line corridor.

The Corridors SEPP also establishes planning provisions around further development adjacent to the corridor. Major transport infrastructure projects require a larger construction footprint (by comparison to the operational rail corridor) temporarily to accommodate construction sites, activities, equipment and workers necessary to efficiently deliver the project within the construction program. Wherever possible, construction footprints have been located within the final operational footprint, to minimise additional property impacts and avoid, property impacts only required during construction.

4.13.3 Impacts on existing land uses

Submission identification number

SE-12354298.

Issue raised

A submitter raised concern that the project is inconsistent with the current land zoning of their property and surrounding properties along Samuel Marsden Drive in Orchard Hills (in close proximity to the stabling and maintenance facility), and that the project has not considered a development application that has been approved on their land which allows further residential development. The submitter requested rezoning of their property to be consistent with the surrounding land uses now that it would be located in an 'industrial land pocket'.

The submitter also raised concern that the project would result in impacts on property access and this has not been addressed in the Environmental Impact Statement.

Response

Temporary and permanent property and land use impacts were identified in Chapter 19 (Land use and property) of the Environmental Impact Statement. Section 19.6.1 of the Environmental Impact Statement acknowledges that the project would permanently change the land uses within the operational footprint of the project.

Construction and operation of State significant infrastructure (such as the project) commonly results in inevitable property and community impacts. Importantly, planning controls under environmental planning instruments do not apply to State significant infrastructure. The design development for the project included a focus on avoiding and/or minimising potential impacts on property and land use. This has included minimising the extent of construction that would require private property acquisition.

Potential impacts on properties not acquired by the project would be minimised through the implementation of the mitigation measures provided in Chapter 7 (Revised performance outcomes and mitigation measures). See Section 4.13.4 for a discussion of the benefits the project would have for future planning and development and communities.

The zoning of land outside the immediate footprint of the project would be a matter for the relevant planning authority (for example, Penrith City Council) and is outside the scope of the project. The project and the corridor required for the project is identified in strategic planning documents and is protected under the Corridors SEPP.

The project would be designed in accordance with the performance outcomes for transport which require safe access to properties to be maintained during construction unless alternatives are agreed with property owners and businesses.

In accordance with the Construction Traffic Management Framework provided in Appendix G of the Environmental Impact Statement, safe access to properties and pedestrians would be maintained during construction. Any access restrictions, including alternative arrangements, for residents, tenants or property owners are to be undertaken in consultation with the occupiers of the property.

4.13.4 Impacts on future land use

Submission identification number

SE-11091495.

Issue raised

A submitter raised concern that a station at Orchard Hills would justify urban sprawl and is not needed.

Response

The project would include six new metro stations between St Marys and the Aerotropolis Core precinct (the area to be called Bradfield), including the station, station precinct and interchange facilities at Orchard Hills. As outlined in Section 7.3.4 of the Environmental Impact Statement, the project does not propose development that is integrated with stations. Opportunities for development within the wider station precinct are beyond the scope of the project.

The project has been driven by the identified strategic need for an integrated transport solution that can support and shape the Western Parkland City by optimising land use around station precincts.

The new metro railway will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Greater Sydney's public transport system with a fast, safe and easy metro service.

Section 19.6 of the Environmental Impact Statement includes an assessment of potential impacts of the project on existing and planned land uses during operation. This acknowledges that land use changes may occur in response to the introduction of new metro stations, including at Orchard Hills.

Future land uses would be developed in accordance with the strategic planning for the Greater Penrith to Eastern Creek Growth Investigation Area and would be required to respond to the project and appropriately define land use types and development form and location.

4.13.5 Impacts on proposed development and development applications

Submission identification number

SE-11765272.

Issue raised

A submitter raised concern that tunnel depths at St Marys need to be confirmed so that pending development applications can be progressed. The submitter is concerned that development (including a development application for mixed use development in St Marys town centre) would be held up because of the project.

Response

Sydney Metro provided information regarding the project in June 2020 when the *Sydney Metro – Western Sydney Airport Scoping Report* (Sydney Metro, 2020a) was released. The Environmental Impact Statement, exhibited in late-2020, identified the corridor in more detail, including the substratum elements. A long-section for the St Marys to Orchard Hills tunnel is shown in Figure 7-4a of the Environmental Impact Statement. The St Marys to Orchard Hills tunnel would typically be about 15 to 35 metres below surface level. Exact depths would be confirmed during further design development.

Prior to the approval of the project, if a development application is lodged, the likely impacts of the subject development, including with the project, would be considered by the consent authority in consultation with Sydney Metro. If the project is still under assessment at the time the development application is lodged, Sydney Metro would anticipate engagement from the local council in order for the consent authority to properly consider the likely impacts of the proposed development in accordance with the evaluation requirements under the EP&A Act.

Following approval of the project, development applications would be referred to Sydney Metro for concurrence so that Sydney Metro – Western Sydney Airport infrastructure is not impacted by future development activities. Under Clause 86 of the *State Environmental Planning Policy (Infrastructure) 2007*, which is triggered in respect of excavation in, above, below or adjacent to rail corridors, Sydney Metro would need to consider the following in deciding whether to provide concurrence:

- the potential impact of the development, including cumulative impact, on the safety or structural integrity of existing or proposed rail infrastructure facilities in the rail corridor, and the safe and effective operation of existing or proposed rail infrastructure facilities in the rail corridor
- what measures are proposed to avoid or minimise those potential impacts.

Sydney Metro is required to exercise its concurrence functions within legislated timeframes. The requirement for referral should therefore not result in any additional unnecessary delays.

4.14 Social and economic

4.14.1 Health and wellbeing

Submission identification number

SE-12354298.

Issue raised

A submitter raised concern about the health and wellbeing impacts of the project, including as a result of:

- the stress associated with uncertainty regarding acquisition

- traffic, noise, air quality, and property access impacts on their property
- ongoing consultation required for development in their area (from multiple stakeholders).

Response

Potential health and wellbeing impacts of the project during construction and operation are assessed in Sections 21.5 and 21.6 of the Environmental Impact Statement.

Section 21.5 of the Environmental Impact Statement identifies the potential health and wellbeing impacts as a result of the uncertainty surrounding property acquisitions. Property and land use impacts for the submitter's property is discussed in Section 4.13.3.

Section 21.5 of the Environmental Impact Statement also identifies the potential risk of adverse health and wellbeing impacts during construction of the project as a result of potential noise and air quality impacts. Transport, noise and air quality impacts specific to this submitter's property is provided in Sections 4.7.2, 4.8.1 and 4.15.1 respectively. Potential transport, noise, air quality and property impacts during operation would be managed in accordance with the Construction Environmental Management Framework (Appendix E), Construction Noise and Vibration Standard (Appendix F) and the performance outcomes and mitigation measures for the project.

The Construction Environmental Management Framework describes the approach to environmental management during construction. The framework identifies the environmental, stakeholder and community management systems and processes that would be applied during construction. Specifically, it lists the requirements to be addressed by the construction contractors and Sydney Metro in developing the Construction Environmental Management Plans, sub-plans and other supporting documentation for each specific environmental aspect in accordance with the Construction Environmental Management Framework and any requirements of the critical State significant infrastructure conditions of approval and Airport Plan (as varied). The Construction Environmental Management Framework also identifies protocols for environmental monitoring, inspections, auditing and reporting.

A summary of community consultation activities undertaken during exhibition of the Environmental Impact Statement is included in Section 2.2. Proactive consultation would continue with the community through further design development, construction, and operation, in accordance with the Overarching Community Communications Strategy (Appendix C). The Overarching Community Communications Strategy also outlines Sydney Metro's approach to coordinating communications between interfacing projects.

4.15 Air quality

4.15.1 Air quality impacts

Submission identification number

SE-12354298.

Issue raised

A submitter raised concern over air quality impacts, including dust and pollution, on their property along Samuel Marsden Drive in Orchard Hills from the stabling and maintenance facility.

Response

Dust impacts during construction of the off-airport construction corridor (which includes the stabling and maintenance facility) are discussed in Section 22.5.1 of the Environmental Impact Statement. Dust impacts are assessed as high risk without mitigation and low risk with mitigation.

The Construction Environmental Management Framework (Appendix E) details the approach to air quality management, including mitigation measures that would be implemented for the project. The Construction Environmental Management Framework requires preparation of a Construction Air Quality Management Plan.

Section 22.6 of the Environmental Impact Statement discusses air quality impacts during operation of the project.

The project would be powered by electricity and therefore local emissions generated during operation are expected to be minimal. The operation of metro trains would generate minor quantities of particulate matter (PM₁₀), carbon monoxide, volatile organic compounds and oxides of nitrogen mainly

due to the wear of the train brake pads, vaporisation of metals due to sparking, and wear of steel due to friction between wheels and rail. These emissions would represent very low concentrations, and potential impacts at nearby sensitive receivers during operation would be negligible.

Overall, the project is anticipated to benefit regional air quality by delivering an attractive alternative mode of transport, which could result in a mode shift from road to rail. This has the potential to reduce potential air pollution emissions associated with road transport and associated congestion, when compared to the emissions that would otherwise occur if the project was not delivered.

4.16 Hazard and risk

4.16.1 Bushfire risks

Submission identification number

SE-11496581.

Issue raised

A submitter asked how the project would manage bushfire risks.

Response

Sections 23.3 and 23.4 of the Environmental Impact Statement assess the potential bushfire risks of the project during construction and operation. The project traverses bushfire prone land off-airport and on-airport.

Mitigation measures HR2 and OHR2 require that a Bushfire Management Plan would be prepared and implemented to manage current bushfire risk and identify response actions during construction and operation of the project. The Plan would be prepared in consultation with the NSW Rural Fire Service and Western Sydney Airport. For project areas on-airport, the Bushfire Management Plan would be prepared having regard to the existing *Western Sydney Airport Site at Badgerys Creek Bushfire Risk Management Plan* (Western Sydney Airport Corporation, 2019e).

4.17 Cumulative impacts

4.17.1 Cumulative land use and transport impacts

Submission identification number

SE-11788120.

Issue raised

A submitter raised concerns about the cumulative land use and construction transport impacts of projects on their property along Elizabeth Drive in Badgerys Creek. The submitter commented that their property would be subject to cumulative land acquisition of 107 hectares between the project, future M12 Motorway and future Outer Sydney Orbital corridor, and that further consideration should be given to the cumulative transport impacts during construction. Concerns include lack of detail and consultation about timing of land use and property impacts from the project and the future M12 Motorway significantly impacting the ability to master plan their property and concerns that this will sterilise development in the area.

The submitter also raised concerns that the project must consider how future crossing points would be provided with potential future projects, including potential future freight connections.

Response

Potential cumulative impacts of the project, including cumulative land use, construction traffic, and property impacts, are identified and assessed in Sections 24.4 and 24.5 of the Environmental Impact Statement.

Cumulative land use impacts may occur during operation as the project is located within an area subject to extensive land use change arising from other infrastructure projects (such as the future M12 Motorway and Western Sydney International) and broader strategic planning processes. Property acquisition is being carried out in accordance with the provisions of the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW). Any compensation payable by Sydney Metro in respect of an interest in land that it acquires for the project, will be made in accordance with the provisions of that Act.

During operation, potential cumulative impacts on land use and property may include:

- changes to the traditional rural residential land use to include road, rail, and airport transport infrastructure in the area south of M4 Western Motorway
- potential property fragmentation where the project is located at surface level or on viaduct, particularly where the project alignment is located in proximity to the future M12 Motorway such as properties north of Elizabeth Drive
- property acquisition (some partial and some full) and property adjustments (access, fences, and farm infrastructure) for the projects.

New mitigation measures LU3 and OLU1 have been included to respond to submissions on this issue, and commit to the following:

- where a property would be potentially fragmented by the construction corridor, access to properties would be maintained in consultation with landowner(s)
- where a property would be potentially fragmented by the rail corridor access to properties would be provided. The location of access to be provided would be agreed in consultation with the landowners(s).

The design and location of the project would not preclude the provision of any future cross-corridor connection opportunities as part of planned developments.

Potential cumulative transport impacts of the project during construction are summarised in Section 24.4.1 of the Environmental Impact Statement and are considered in detail in Chapter 6 of Technical Paper 1 – Transport.

Construction of the project would overlap with the construction activities associated with the future M12 Motorway and Western Sydney International which are due to be completed in 2025 and 2026 respectively. Potential cumulative transport construction impacts were determined from the WestConnex Road Toll Model (WRTM) outputs developed for the Environmental Impact Statement. This model included the future M12 Motorway project to ensure cumulative impacts from the operation of the project along with the future M12 Motorway and Western Sydney International were considered.

As outlined in Section 6.8.6, as part of the *M12 Motorway Amendment Report* (Transport for NSW, 2020a), further WRTM updates have been undertaken using more recent traffic data and updated land use and demographics data (based on 2016 land use forecasts by the Department of Planning, Industry and Environment and adjusted to include Western Sydney International forecast data). The model for the *M12 Motorway Amendment Report* indicates that there is an overall reduction in forecast future trips to the South West Growth Area in Western Sydney in 2036 compared to the forecast future trips reported in the M12 Environmental Impact Statement, which were based on 2014 land use forecasts by the Department of Planning, Industry and Environment. This would indicate that traffic forecasts are likely to be lower by comparison to those reported in the Sydney Metro – Western Sydney Airport Environmental Impact Statement. As such, the traffic assessment prepared for the Environmental Impact Statement is considered likely to be conservative.

Key potential cumulative transport impacts during construction include a temporary increase in construction vehicles on the road network, in particular north of Western Sydney International, and associated impacts as a result of overlapping construction activities from the future M12 Motorway and Western Sydney International which are due to be completed in 2025 and 2026 respectively.

The project would be designed to meet the performance outcomes for potential cumulative impacts, which includes the requirement for potential cumulative impacts to be managed through coordination of construction activities and communication processes with nearby projects (Western Sydney International, future M12 Motorway, The Northern Road, St Marys Intermodal and St Marys Commuter Car Park Expansion).

Mitigation measure CL1 requires that a Cumulative Construction Impacts Management Plan would be developed and would detail coordination and consultation requirements with the following stakeholders (as relevant) to manage the interface and potential impacts of projects under construction at the same time:

- Western Sydney Airport
- Transport for NSW

- Western Parkland City Authority
- Sydney Water
- Emergency service providers
- Utility providers.

Coordination and consultation requirements with these stakeholders would be detailed in the plan to include:

- provision of regular updates to the detailed construction program, construction sites and haul routes
- identification of key interfaces with other construction projects
- development of mitigation strategies to manage cumulative impacts associated with these interfaces.

The Outer Sydney Orbital project was identified in the Environmental Impact Statement as a strategic planning project that may interact with the project in the future. The Outer Sydney Orbital project contributes to the development of the Western Parkland City and is discussed further in Chapter 2 (Strategic need and justification) of the Environmental Impact Statement. However, given that the impacts of the Outer Sydney Orbital project are not currently known with sufficient precision, they were not considered for inclusion in the cumulative impact assessment for the project. Impacts as a result of the Outer Sydney Orbital would be subject to separate assessment and approvals once that project has been subject to further design development.

4.18 Environmental management framework

4.18.1 Construction environmental management framework

Submission identification number

SE-11790344.

Issue raised

A submitter commented that the Environmental Impact Statement does not provide any assurances for residents during construction and expressed a general concern about noise and vibration, air quality and loss of amenity during construction.

Response

Potential impacts from noise and vibration, air quality and loss of amenity would be mitigated through the implementation of the performance outcomes and mitigation measures during construction and operation as outlined in Chapter 7 (Revised performance outcomes and mitigation measures).

Chapter 25 (Environmental management framework) of the Environmental Impact Statement identifies the process for inspections, monitoring, auditing, and reporting of environmental compliance during construction of the project. Complaints handling procedures for the project are outlined in Section 5.6.1 of the Environmental Impact Statement.

The framework for managing identified impacts during construction is outlined in Section 25.2 of the Environmental Impact Statement. Identified impacts would be managed in accordance with the Construction Environmental Management Framework (Appendix E), Construction Traffic Management Framework (refer to Appendix G of the Environmental Impact Statement), Construction Noise and Vibration Standard (Appendix F), Overarching Community Communications Strategy (Appendix C), Sustainability Management Plans, conditions of approval and the performance outcomes for the project. These requirements would inform the development of management plans that would detail how potential amenity impacts would be addressed during the construction of the project.

4.19 Beyond the scope of the Environmental Impact Statement

4.19.1 Future metro extensions

Submission identification numbers

SE-10330837, SE-11091495, SE-11176474, SE-11496581, SE-11728931, SE-11752741, SE-11790344, SE-12014088, SE-11772947.

Issues raised

Submitters raised the following about possible future extensions of the Sydney Metro network which is beyond the scope of the Environmental Impact Statement:

- comments about and requests for a potential northern extension of the project from St Marys to Tallawong (Metro North West Line in Rouse Hill)
- queried whether stations in Macarthur and Oran Park would be provided as part of a southern extension of the project between Western Sydney Aerotropolis and Macarthur / Campbelltown
- comments about and requests for a potential South West Rail Link extension between Aerotropolis Core and Leppington
- queried whether metro rail would be extended to provide a connection between St Marys and Parramatta.

Response

The project is the first stage of the recommended North South Rail Line Corridor and has been prioritised in order to provide rail access to Western Sydney International and an interchange with the existing Sydney Trains network.

Planning is also underway to deliver:

- a new metro line from Westmead to Western Sydney International
- a new metro line from Western Sydney International to Macarthur
- a new metro line from Bankstown to Liverpool
- extending the Metro North West Line from Tallawong Station at Rouse Hill via Schofields to St Marys Station.

As part of the Western Sydney City Deal, the NSW Government has committed to investigating a range of other transport connectivity initiatives to support the Western Parkland City. For example, *Future Transport 2056* prioritises rapid bus services from the metropolitan centres of Penrith, Liverpool and Campbelltown to the new airport and Aerotropolis, continued planning for a rail connection between Leppington and the new airport precinct, and additional road, cycling and walking connections to support access to jobs and services.

4.19.2 Concerns about Western Sydney International

Submission identification numbers

SE-10308028, SE-10499980, SE-11757935, SE-11772947, SE-10350222, SE-11783278.

Issues raised

Submitters raised issues about Western Sydney International which is beyond the scope of the Environmental Impact Statement, including:

- concerns about 24-hour operation of the airport
- concerns about noise impacts from flight paths associated with the airport
- comments that Western Sydney International is not needed, and that there is no justification for the project without a viable airport
- suggestion that there should be a fully enclosed or underground pedestrian connection between the Airport Terminal Station and Western Sydney International

- suggestion for active transport connections between the Airport Terminal Station and the western boundary of the site, and for cycle path access to Western Sydney International at Anton Road to support connectivity of the Agribusiness Precinct and wider Western Sydney Aerotropolis.

Response

The need for and the operation of Western Sydney International is outside the scope of the Sydney Metro – Western Sydney Airport project and subject to separate approvals by the Australian government.

Western Sydney International is currently under construction, with operations scheduled to start in 2026. The new airport will support growth of the international and domestic passenger and freight markets, and the district's economy, by attracting visitors to the Western Parkland City.

Customer access between Airport Terminal Station and the airport terminal would be weather protected and is currently being designed by Western Sydney Airport. The design of this access is beyond the scope of the Sydney Metro – Western Sydney Airport project and the Environmental Impact Statement.

Objectives and opportunities for active transport corridors for the Western Sydney Aerotropolis precincts are identified in the *Draft Aerotropolis Precinct Plan* (NSW Government, 2020b). An extension of Anton Road is identified as part of the principal regional cycle path network (off-road). An active transport connection will be provided from Elizabeth Drive to Airport Terminal Station via the airport business park connecting to the wider active transport network.

4.19.3 Other transport projects

Submission identification numbers

SE-11772947, SE-11075721, SE-11791548.

Issues raised

Submitters commented on other transport projects which are beyond the scope of the Environmental Impact Statement, including:

- comment that freight rail infrastructure should be provided for Western Sydney Airport and the Aerotropolis and it currently depends heavily on road infrastructure or commuter rail
- querying whether there can be a direct link from Bankstown to the new Western Sydney Airport
- comment that more railway lines and stations are required in western Sydney in general.

Response

The subject of the Environmental Impact Statement relates to the construction and operation of Sydney Metro – Western Sydney Airport between St Marys and Western Sydney Aerotropolis. The suggestions identified in the submissions are beyond the scope of Sydney Metro – Western Sydney Airport project.

The need for freight rail in the Western Parkland City is identified in the Western Parkland City Plan, and the Corridors SEPP provides reservation for the Western Sydney Freight Line (Stage One).

Future Transport 2056 does not identify a direct link from Bankstown to Western Sydney International as a key strategic transport corridor. While the NSW Government has recently consulted on rail services west of Bankstown, this does not make provision for new rail routes. Nevertheless, as part of the Western Sydney City Deal, the NSW Government will establish rapid bus services from the metropolitan centres of Penrith, Liverpool, and Campbelltown to Western Sydney International before its planned opening, and to the Aerotropolis. Bankstown is well connected to Liverpool via the T3 Liverpool Line, and is connected to the project at St Marys via the T3 Lidcombe Line and T1 Western Line.

The station precinct options analysis for the project is provided in Section 4.4.2.

4.19.4 Cumberland Plain Conservation Plan

Submission identification number

SE-12354298.

Issue raised

A submitter raised concerns about the inclusion of their property in the *Draft Cumberland Plain Conservation Plan 2020–56* (Department of Planning, Industry and Environment, 2020b), and that an approved development application for further residential development on their property was not considered in the plan, which is beyond the scope of the Environmental Impact Statement.

Response

The inclusion of properties in the *Draft Cumberland Plain Conservation Plan 2020–56* is beyond the scope of the Sydney Metro – Western Sydney Airport project.

The *Draft Cumberland Plain Conservation Plan 2020–56* has been developed through strategic conservation planning by the Department of Planning, Industry and Environment to help meet the future needs of our community while protecting threatened plants and animals in the long term. The plan was on public exhibition from 26 August 2020 until 2 November 2020. The Department of Planning, Industry and Environment is currently reviewing and considering all feedback received to help finalise the Plan.

4.20 Submission received on the EPBC Act draft environmental impact assessments

Issue raised

A submitter raised a suggestion for a fast metro line from Central Station to Western Sydney Airport with stations at Olympic Park and Parramatta.

Response

Planning for Sydney Metro West is currently underway and involves a new 24-kilometre metro line that would connect Greater Parramatta with the Sydney CBD. Confirmed stations include Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Sydney CBD.

As shown in Figure 1-1, a future metro line has been identified to extend the Sydney Metro West line through to Western Sydney International. The potential future East West Rail Link to connect Greater Sydney's three cities, will provide rail connectivity between the Western Parkland City, the Central River City and the Eastern Harbour City.

The Sydney Metro – Western Sydney Airport project has been designed to allow for development of future rail lines, including the potential future East West Rail Link and extension of the existing South West Rail Link. This has included provision of space within the corridor, where the rail infrastructure is at surface, from north of Elizabeth Drive to the Aerotropolis Core to allow for development of these potential future rail links. The Airport Business Park, Airport Terminal and Aerotropolis Core stations have also been designed to allow for the future development of these potential rail links.

Further detail on the submissions received through the Commonwealth process and responses to those submissions are provided in the *EPBC Act Final Environmental Impact Assessment of on-airport proposed action (EPBC 2019/8541)* (Sydney Metro, 2021a) and the *EPBC Act Final Environmental Impact Assessment of off-airport proposed action (EPBC 2020/8687)* (Sydney Metro, 2021b).

5 NSW Government and key stakeholder submissions

This section provides responses to issues raised in submissions from NSW Government agencies and key stakeholders.

5.1 Overview of submissions received

Submissions were received from the following local councils and NSW Government agencies:

- Penrith City Council
- Liverpool City Council
- Blacktown City Council
- EES
- Department of Planning, Industry and Environment (Water)
- DPI Fisheries
- EPA
- Heritage NSW (Heritage Council of NSW)
- Heritage NSW (Aboriginal Cultural Heritage Regulation Branch)
- WaterNSW
- Sydney Water
- TransGrid.

Submissions were received from the following key stakeholders:

- University of Sydney
- Western Sydney University
- Urban Development Institute of Australia NSW (UDIA).

The approach to processing and responding to submissions, including government and key stakeholder submissions, is described in Chapter 3 (Analysis of submissions). The issues raised in the NSW Government and key stakeholder submissions are categorised as described in Section 3.2 and responses are provided in the following sections.

Full details of the issues raised are provided in the complete submissions, available on the Department of Planning, Industry and Environment's Major Projects website (www.planningportal.nsw.gov.au/major-projects/project/35016).

5.2 Penrith City Council

5.2.1 Support for the project

Issue raised

Council expressed their support for the project and, more broadly, the Government's investment in public transport capacity to improve connectivity in Western Sydney.

Response

Council's support for the project is noted.

5.2.2 Project development and alternatives

Station location alternatives

Issues raised

Council requested consideration of a station at The Quarter, which is a Health and Education Precinct spanning more than 300 hectares between Penrith and St Marys. Council recommended:

- the Sydney Metro – Western Sydney Airport business case be made public to enable an understanding of the evaluated performance of the shortlisted station precincts
- the project extend the station catchments to The Quarter.

Response

Consistent with the NSW Government's whole-of-government policy, a summary of the business case is publicly available on the Infrastructure NSW website (INSW, 2020).

Sydney Metro – Western Sydney Airport has been designed to deliver fast and efficient metro services and preferred station locations are determined to get the best customer and community outcomes.

A number of station locations were considered to connect the T1 Western Line to the new Aerotropolis as part of the Project development. The analysis of station precinct options and the outcome of this assessment is documented in Section 6.4 of the Environmental Impact Statement.

A guiding principle for Sydney Metro – Western Sydney Airport is to offer fast, high frequency services to key activity centres and facilitate a 30-minute city. A range of factors influence travel time, including the number and location of stations. A primary consideration in the project development process was to provide a balance between the number and location of stations, considering drivers such as productivity and land use benefits, accessibility, travel times and project cost. This process of station precinct identification was undertaken independently of the rail corridor alignment development process. The challenge of balancing the optimal number and location of stations with travel times has a direct influence over the land use outcomes, economic benefits, expanded customer catchments and increased network connectivity.

The assessment in Section 6.4 of the Environmental Impact Statement showed that a station at the Western Sydney University precinct (within the Quarter) would perform poorly against the 'sustainable and deliverable solution' objective and would have considerable construction, program and interface impacts and risk which outweighed the benefits of a station in this location. Further, Western Sydney University students and associated jobs growth would be outside of a 15-minute walking catchment from a station at Western Sydney University's Werrington precinct.

A more direct tunnel route between St Marys and Orchard Hills provides cost benefits in delivery of the project and travel time savings, by connecting the airport faster to the key T1 Western Line interchange at St Marys.

Compared with a station (and associated tunnel infrastructure) at St Marys and Orchard Hills, a station at Western Sydney University would:

- need to be constructed concurrently with tunnelling activities that would also need to be located at the station site, resulting in a very large property impact requirement
- require the launch and support of four TBMs (instead of two) for the St Marys to Orchard Hills tunnel in addition to station construction requirements
- result in greater travel times for customers travelling between Western Sydney International and St Marys
- require an additional three kilometres of tunnel length that would require two tunnel portal facilities (compared with up to one as part of the tunnel between St Marys and Orchard Hills), increasing comparative costs and affecting overall value-for-money.

Currently, the Western Sydney University Werrington Campus can be accessed from Kingswood Station or Werrington Station via shuttle bus, cycling, walking, bus, or driving.

Chapter 9 (Transport) of the Environmental Impact Statement outlines that the project would integrate seamlessly with the station precincts and existing and future transport interchange facilities, providing connectivity with pedestrian, cycling and public transport networks, and providing opportunities for integration with future land uses and infrastructure. Indicative transport interchange provisions proposed specifically at St Marys Station and Orchard Hills Station (the two closest metro stations to the Western Sydney University Werrington Campus) are also outlined in Section 9.6.1 of the Environmental Impact Statement.

Strategic planning for future transport solutions would be undertaken by Transport for NSW in consultation with Sydney Metro and relevant stakeholders, including Western Sydney University.

Further details regarding the assessment of station location options is provided in Section 4.4.2.

5.2.3 Project description – operation

Station and precinct development

Issues raised

Council noted the role of government in future precinct development and recommended that Council:

- undertake local strategic planning as well as the development application process
- lead future station precinct development in collaboration with government
- is represented on the Design Panels for the project.

Response

There are a range of different stakeholders who would have a role in delivering place outcomes across the project corridor and at station precincts including Council and Sydney Metro. At all off-airport stations, Sydney Metro would deliver public domain elements and work with other parts of Transport for NSW and other key stakeholders to deliver transport integration elements beyond the scope of the project.

Council is responsible for local strategic planning and managing the local development application process. Council would also lead future precinct development around the proposed metro stations, in collaboration with government and key stakeholders. Sydney Metro would consider strategic planning undertaken by Council in the design development of the project.

Sydney Metro's scope to deliver place outcomes would relate to the physical infrastructure to be delivered as part of the project. Any additional integrated and precinct developments would be subject to separate approval. Sydney Metro would liaise with Council on planned development outcomes for any future potential integrated and precinct developments (subject to separate approval).

Strategic planning for the area would be undertaken as part of the Greater Penrith and Eastern Creek Growth Investigation Area by the Greater Sydney Commission in collaboration with relevant state agencies and Council, and is beyond the scope of the project.

Sydney Metro has commenced engagement with local councils and other relevant stakeholders regarding the project design, and would continue to engage these stakeholders throughout design development. A new mitigation measure (OLU2) has been included to confirm that Sydney Metro would continue to consult with key stakeholder during design development of station interchanges and precincts. Chapter 7 (Project description – operation) of the Environmental Impact Statement outlines that the design development process would be guided by a suite of documents including the Sydney Metro design objectives, Design Quality Framework and Design Guidelines (Appendix D). These documents, along with community and stakeholder engagement and the establishment of a Design Advisory Panel (prior to project approval) and a Design Review Panel (if the project is approved), would allow for high quality standards throughout the whole design process. At relevant stages in the design process, the design would be reviewed against the Design Guidelines and design objectives.

The Design Advisory Panel would provide independent design review of the project, support the achievement of the project objectives and guide urban design, master planning and precinct outcomes. Councils have been invited to participate in Design Advisory Panel meetings as relevant to advise on local issues and design outcomes as they relate to the local context.

If the project is approved, the Design Review Panel would then be established for the project to provide independent, high level design review of stations and interchange areas and other ancillary facilities in relation to architectural, heritage and landscaping design.

Outside this process, a series of stakeholder and design review processes would also be undertaken, including regular meetings with Penrith City Council regarding design development.

A range of stakeholders would have a role in delivering place outcomes across the project corridor and at station precincts. At all off-airport stations, Sydney Metro would deliver public domain elements and work with other parts of Transport for NSW and other key stakeholders to deliver transport integration elements.

Connectivity at St Marys Station

Issues raised

Council recommended an underground pedestrian connection to the existing St Marys Station rather than the above ground pedestrian connection currently proposed. Council also expressed their support for the retention of the existing pedestrian overpass at the station, but recommended its upgrade to improve active transport access around the interchange.

Response

An above ground pedestrian connection to the existing St Marys Station would be provided for access between the metro and heavy rail stations (via escalators, stairs and lifts) and would also provide a connection to the area north of the existing T1 Western Line. Using this connection, customers would be able to easily transfer between metro, heavy rail and bus services.

An underground pedestrian connection at St Marys was explored during design development, but was found to have considerable construction, program and budget risks compared to the above ground option. Additionally, the above ground option provides more vertical transport options to the T1 Western Line at St Marys. The above ground concourse option would assist in facilitating design outcomes by making use of natural light and creating intuitive navigation and wayfinding between the metro and existing T1 Western Line.

Council's support for the retention of the existing pedestrian overpass is noted; however, an upgrade to the existing overpass is outside the scope of the project.

Connectivity at Orchard Hills Station

Issues raised

Council recommended the Orchard Hills Station catchment be extended to the east to provide connectivity with St Clair and Erskine Park and the west to serve Glenmore Park, and that the project include the provision of west facing ramps at the Kent Road/M4 interchange to allow access from the Blue Mountains at the Kent Road/M4 interchange.

Council expressed their support the provision of up to 500 new park-and-ride facilities south of Lansdowne Road, but recommended that these facilities would be better located north of the station to avoid increased traffic in the town centre, allow easy access from the M4 Motorway and better support a potential increase in parking capacity.

Response

Strategic planning for the area around Orchard Hills would be undertaken as part of the Greater Penrith and Eastern Creek Growth Investigation Area by the Greater Sydney Commission in collaboration with relevant state agencies and council, and is beyond the scope of the project. The project does not preclude an eastern road connection from Orchard Hills to St Clair. If this connection is determined to be required in the future it would be delivered by other government agencies. St Clair would be linked to the Sydney Metro – Western Sydney Airport line via existing transport connections to the existing St Marys Station.

Based on predicted traffic volumes in 2026 (year of opening) and 2036 (10 years after opening) the transport assessment has not identified the need for an upgrade of the Kent Road/M4 Western Motorway interchange as part of the project. Sydney Metro is not proposing to provide west facing ramps at the Kent Road/M4 Western Motorway interchange. The project does not preclude this, should Transport for NSW determine that it is warranted in the future as a result of ongoing urban development in the surrounding areas.

The park-and-ride facility at Orchard Hills is located to the south of the station with direct access from Lansdowne Road and with a pedestrian connection to the station to the north. The indicative operational layout of Orchard Hills Station (shown in Figure 7-19 of the Environmental Impact Statement) indicates that traffic would access the park-and-ride facilities from south of Orchard Hills Station via Kent and Lansdowne roads and so would not result in traffic impacts on the future town centre. The final operational layout is subject to further design development.

The proposed location of the park-and-ride facilities also reduces potential impacts on vegetated areas to the north of the station.

5.2.4 Transport

Location of the temporary bus interchange at St Marys

Issues raised

Council does not support the temporary removal of car parking on Nariel Street, Carinya Avenue, West Lane, Belar Street and Phillip Street to facilitate the relocation of the temporary bus interchange. Council recommended that the option identified in Chapter 8 (Project description – construction) of the Environmental Impact Statement, for the temporary bus interchange to be located on Station Street, be implemented and planned in consultation with Council.

Response

Consultation on the temporary bus interchange with parties including Penrith City Council has resulted in the relocation of the temporary bus interchange to the Station Street car park instead of Nariel Street to minimise potential parking impacts on Nariel Street and surrounding streets (see Section 6.5).

Mitigation measure T7 has been revised to reflect this and requires that the temporary bus interchange be established prior to the commencement of construction works that impact on the existing bus facilities in Station Street. The temporary relocation of bus stops and the bus layover at St Marys would be undertaken in consultation with relevant stakeholders, including Penrith City Council. Wayfinding and customer information would guide customers to temporary bus stop locations.

Construction parking impacts at St Marys

Issues raised

Council noted that a number of car parking spaces may be impacted during construction and recommended that Sydney Metro work with Council on a suitable parking strategy for the St Marys Station precinct.

Council requested further guarantees to ensure that construction worker parking will not impact available public on-street and off-street car parking in the area around the construction sites.

Response

Parking impacts during construction of the project are discussed in Chapter 9 (Transport) of the Environmental Impact Statement.

As outlined in Section 9.5.1 of the Environment Impact Statement, the car parking survey undertaken by Sydney Metro in 2019 indicates there is existing on-street and off-street capacity within the town centre at St Marys (within 400 metres of affected spaces) to help manage impacts to parking from the project.

The multi-level commuter car park on Harris Street would be extended to include two additional levels of parking (as outlined in Section 6.8.6) and is proposed to be in place prior to the removal of the at-grade commuter car park on Harris Street. These spaces would help manage impacts to parking as a result of the project, with an overall increase of around 120 commuter parking spaces in the area.

As a result of the temporary relocation of the Station Street bus interchange and layover to the Station Street car park during construction of the metro station at St Marys (as outlined in Section 6.5), temporary parking impacts have been reduced by around 70 spaces during construction when compared to the impacts assessed in the Environmental Impact Statement. Up to 365 car parking spaces would be temporarily affected within the St Marys precinct and the road network immediately surrounding the station during the construction period.

A new mitigation measure (T9) has been included which requires a construction worker car parking strategy be prepared specifically for St Marys, in consultation with Penrith City Council and Transport for NSW prior to the commencement of construction. The strategy would consider measures to reduce impacts from construction worker parking along local streets within St Marys, such as Camira Street. Measures identified in the strategy may include: investigating options for parking within construction compounds; encouraging the use of public transport, ride sharing and active transport for workers travelling to and from site; and using shuttles to transport workers from other construction sites (for example, Claremont Meadows and Orchard Hills construction sites), where practicable.

The Construction Traffic Management Framework included in Appendix G of the Environmental Impact Statement sets out the approach to managing construction worker parking, including preparation of

parking management plans where required. Mitigation measure T2 requires a Construction Traffic Management Plan be developed in consultation with the Traffic and Transport Liaison Group, which would include Penrith City Council, to ensure existing transport interchange infrastructure continues to operate effectively within the St Marys station precinct.

Operational parking impacts at St Marys

Issue raised

To ensure appropriate car parking provisions after the completion of the metro station, Council recommended that Sydney Metro work with Council on a suitable parking strategy for the precinct.

Response

In response to consultation feedback, mitigation measure SE2 as outlined in the Environmental Impact Statement has been removed and replaced with a new mitigation measure (OT4) which requires an operational car parking strategy be prepared for St Marys, in consultation with Penrith City Council and Transport for NSW.

Operational road network impacts

Issues raised

Council raised concerns that several intersections are forecast to deteriorate in Level of Service (LoS) with the project, but no specific mitigation measures or infrastructure upgrades are outlined to manage this impact.

Council requested supporting evidence to demonstrate that the combined effects of the provision of the metro service, increases in the number of bus services and enhancements to the walking and cycling facilities are likely to reduce car dependency and minimise the impacts on the study area road network, as outlined in the Environmental Impact Statement.

Council requested identification of mitigation measures or infrastructure upgrades that would be implemented to minimise the impacts of the project on the road network following completion of the project.

Response

Table 9.1 of the Environmental Impact Statement shows the base year (2019) and the predicted future year (2036) without the project to identify intersection performance without the project. At some locations, as a result of background traffic growth, the road network would have a reduced LoS, in particular at the intersection of Mamre Road and the M4 Motorway. This demonstrates that the performance of the road network in future years 2026 and 2036 is largely being driven by background traffic growth associated with development of the Western Parkland City. The project would make only a small contribution to overall traffic growth.

The Environmental Impact Statement predicted that, without the project, intersections are forecast to operate at or above capacity due to the forecast growth in background traffic demand within the study area. Due to the oversaturated conditions prevailing at these intersections, significant delays and queuing are expected, which is likely to increase with the addition of a small amount of traffic forecast to be generated by the project.

The combined effects of the provision of the metro service, increases in the number of bus services and enhancements to the walking and cycling facilities are likely to reduce car dependency and minimise the impacts on the study area road network when compared to a 'do nothing' option.

5.2.5 Noise and vibration

Acoustic sheds during construction

Issues raised

Council recommended that acoustic sheds be used as a standard mitigation measure, rather than an optional mitigation measure, at construction sites to limit noise impacts on neighbouring businesses and residents.

Response

Sydney Metro is not proposing to include acoustic sheds as a standard mitigation measure; however, this is one of a suite of mitigation measures that would be considered. The requirements for acoustic sheds would be confirmed following design development and construction planning.

The noise and vibration assessment included consideration of the potential use of acoustic sheds as part of site specific mitigation measures that could be implemented, subject to further investigation during construction planning and design development. As detailed in Table 8-3 of the Environmental Impact statement, potential sites considered for the use of acoustic sheds include St Marys, Claremont Meadows services facility, Orchard Hills, Western Sydney International tunnel portal, Airport Terminal, Bringelly services facility, and Aerotropolis Core, where high noise generating activities may occur in a consolidated area.

Chapter 10 (Noise and vibration) of the Environmental Impact Statement predicted that with suitable noise attenuation the number and extent of exceedances of the noise management level (NML) could be reduced by around 30 to 50 percent. As noted in the Construction Noise and Vibration Standard (Appendix F), an acoustic shed with no openings would be expected to provide attenuation in the order of 20dB. Chapter 27 (Synthesis) of the Environmental Impact Statement discusses aspects of the construction methodology that may be subject to further refinement, including the location and layout of acoustic sheds (if required).

The Construction Environmental Management Framework (Appendix E) states that Detailed Construction Noise and Vibration Impact Statements would be prepared for noise intensive construction sites or activities including works undertaken outside standard construction hours. All feasible and reasonable mitigation measures would be implemented in accordance with the Construction Noise and Vibration Standard and in accordance with the commitments made in the Environmental Impact Statement.

Mitigation measure NV1 requires that where acoustic sheds are installed, the internal lining and type of material used in the construction of the shed would be considered during design development and construction planning to ensure appropriate attenuation is provided.

5.2.6 Biodiversity

Stabling and maintenance facility

Issues raised

Council recommended existing vegetation within the proposed maintenance facility site be protected to manage heat island effects and habitat connectivity impacts. Council recommended that revegetation and landscape buffers be established before or during construction.

Response

Section 6.7.1 of the Environmental Impact Statement describes the options considered for the location of the stabling and maintenance facility and justification for the preferred option. The options assessment considered a range of engineering and environmental constraints, one of which was to minimise impacts on significant biodiversity and heritage items.

The location and indicative layout plan for the stabling and maintenance facility has been identified in Figure 7-39 of the Environmental Impact Statement. All existing vegetation within this site would likely be removed as earthworks are required across the site to manage drainage and minimise potential flooding impacts. However, in accordance with mitigation measure FF1, the Flora and Fauna Management Plan for the project would detail how the clearing of native vegetation and habitat would be minimised where possible, for example by seeking to locate site offices, site compounds and ancillary facilities in areas where there are limited biodiversity values (e.g. cleared land) and by delaying the removal of vegetation until absolutely necessary. Residual impacts that are not able to be avoided or managed through mitigation measures would be offset for both TECs (ecosystem credits) and threatened species (species credits). Chapter 12 of the Revised Biodiversity Development Assessment Report (Appendix G) provides further details on the biodiversity offset strategy for the project. The site has also been selected as it provides space for additional stabling roads to support potential future extensions of the project if required (refer to Section 7.5.1 of the Environmental Impact Statement).

The project would be designed to meet the construction performance outcomes for biodiversity listed in Table 7-1, including that impacts on threatened flora and fauna species, and ecological communities listed under the BC Act and EPBC Act, would be avoided or minimised where possible.

Mitigation measure OLV3 requires that opportunities to provide vegetation screening of the stabling and maintenance facility would be investigated during design development and has been revised to commit to investigating options for establishing screening vegetation as early in the construction phase as possible.

5.2.7 Social and economic

Involving local communities in construction

Issues raised

Council support all efforts to offer opportunities to local workers and suppliers and has requested that the Sydney Metro Workforce Development and Industry Participation Plan and Aboriginal Participation Plan include objectives to support these local workers and suppliers.

Response

Initiatives for workforce development and industry participation, including local workers and suppliers, and the protection and promotion of Aboriginal and non-Aboriginal heritage and culture are listed in Table 17-1 of Chapter 17 (Sustainability, climate change and greenhouse gas) of the Environmental Impact Statement. These include the following initiatives:

- industry and jobs participation – increase opportunities for employment of local people, participation of small and medium enterprises, including recognised Aboriginal businesses, and support industry to compete in home and global markets through active participation in client-led programs
- workforce skills development – enable targeted and transferable skills development in areas with local and national skills shortages, support changing job roles and increased skill requirements, and embed transferable skills in the workforce.

5.2.8 Beyond the scope of the Environmental Impact Statement

Luddenham Road widening

Issue raised

Council requested that the widening of Luddenham Road identified in the Draft Special Infrastructure Contribution for Western Sydney Aerotropolis be delivered as part of the project.

Response

The requirement to widen Luddenham Road would be driven by the wider development occurring as part of the Aerotropolis and the Northern Gateway precinct and is outside of the scope of the project. Sydney Metro would design the viaduct over Luddenham Road so as not to preclude any future road upgrades.

Section 9.6.1 of the Environmental Impact Statement outlines that the predicted traffic volumes in 2026 (year of opening) and 2036 (10 years after opening) along Luddenham Road indicate that the project would result in a relatively small increase in traffic on the road network in both the AM and PM peaks. Station precinct access to Luddenham Road would be designed with adequate capacity and to allow the safe movement of traffic to and from Luddenham Road.

5.3 Liverpool City Council

5.3.1 Support for the project

Issues raised

Council expressed their support for the project, which will assist in the realisation of Western Sydney International and the Aerotropolis, encourage and increase public transport use to the airport and facilitate planned land use development in and around the airport.

Response

Council's support for the project is noted.

5.3.2 Planning and assessment process

Appropriate regulatory authority

Issues raised

Council raised concerns that the Environmental Impact Statement does not identify which aspects of the project are scheduled activities requiring regulation by the EPA, noting that for Integrated Development, approval must be obtained from the EPA before consent can be granted.

Council noted the consent authority must refer the Development Application to the relevant public authority and incorporate the public authority's general terms of approval. Council requested confirmation as to whether the proposed development would include any non-scheduled activities requiring regulation by Council.

Response

The project has been declared critical State significant infrastructure and is controlled by Division 5.2 of the EP&A Act. Consequently, it is not Integrated Development. As noted in Appendix B (Statutory approvals framework) of the Environmental Impact Statement, environment protection licences which are issued by the EPA may be required for the construction and the operation of the project, as well as for the project's rolling stock. Any licence required from the EPA cannot be refused and must be issued substantially consistent with the critical State significant infrastructure approval. However, as the project is critical State significant infrastructure, approval from the EPA is not required in order for planning approval to be granted. Further, as the project has been declared critical State significant infrastructure, the project does not require approval from Council.

Sydney Metro has undertaken consultation with Liverpool City Council specifically to discuss the critical State significant infrastructure framework and the roles of Council, the Department of Planning, Industry and Environment and Sydney Metro within that framework.

Sydney Metro are working with Council to identify the need for an interface agreement. Should one be needed, the interface agreement would set out arrangements for how issues related to ongoing consultation and interfaces with Council are addressed.

Roads Act 1993 (NSW)

Issues raised

Council requested Sydney Metro comply with the requirements of the *Roads Act 1993* (NSW) (Roads Act) including obtaining relevant permits and/or approval from Council.

Response

Some provisions of the Roads Act may apply to the project, however as discussed in Appendix B (Statutory approvals framework) of the Environmental Impact Statement, in accordance with clause 5 of Schedule 2 of the Roads Act and section 38N of the Transport Administration Act, Sydney Metro is exempt from the requirement to obtain a consent under section 138 of the Roads Act in, on or over an unclassified road or a classified road for which council is the roads authority.

Council approval of transport interchange plans

Issues raised

Council recommended design drawings of the proposed transport interchange be prepared in accordance with Council and other relevant guidelines and be submitted to Council for approval prior to construction.

Response

As the project has been declared critical State significant infrastructure, subject to assessment and approval by the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act, Council would not be exercising a consent authority function. Design development would be undertaken in accordance with conditions of approval if the project is approved.

Chapter 7 (Project description – operation) of the Environmental Impact Statement outlines that the design development process would be guided by a suite of documents including the Sydney Metro design objectives, Design Quality Framework and Design Guidelines (Appendix D). These documents, along with community and stakeholder engagement and the establishment of a Design Advisory Panel (prior to project approval) and a Design Review Panel (if the project is approved), would ensure high

quality standards throughout the whole design process. At relevant stages in the design process, the design would be reviewed against the Design Guidelines and design objectives.

The Design Advisory Panel would provide independent design review of the project, support the achievement of the project objectives and guide urban design and guide strategic planning outcomes. Councils have been invited to participate in Design Advisory Panel meetings as relevant to advise on local issues and design outcomes as they relate to the local context.

Subject to project approval, the Design Review Panel would then be established for the project to provide independent, high level design review of stations and interchange areas and other ancillary facilities in relation to architectural, heritage and landscaping design etc.

Outside this process, a series of stakeholder and design review processes would also be undertaken, including regular meetings with Liverpool City Council regarding design development.

A new mitigation measure has been developed (OLU2) which outlines that Sydney Metro would continue to consult with key stakeholders during design development of the station interchanges and precincts.

5.3.3 Stakeholder and community engagement

Community liaison committee

Issues raised

Council recommended a community liaison committee be formed including representatives from the consent authority and appropriate regulatory authority to meet regularly to resolve concerns related to the project.

Council recommended that adequate community consultation be carried out, including with relevant councils and other stakeholders.

Response

An Overarching Community Communications Strategy (Appendix C) has been prepared to guide Sydney Metro's approach to stakeholder and community liaison including engagement with communities, stakeholders and businesses. The Overarching Community Communications Strategy provides for stakeholder meetings, presentations and forums to be used where appropriate, but does not include regular liaison committees.

Sydney Metro has and would continue to consult with the community. Community and stakeholder consultation undertaken for the project to date, as well as details of future consultation, are outlined in Chapter 2 (Stakeholder and community consultation). Ongoing consultation would be guided by the Overarching Community Communications Strategy.

5.3.4 Project description – operation

Station and precinct development

Issues raised

Council raised concern about the lack of detail surrounding the station precincts and associated business opportunities and noted that this information is required for Council to assess the potential economic impacts of the project.

Council noted the importance of consultation with the Western Sydney Planning Partnership to ensure station precinct developments respond to the draft precinct plans for the Aerotropolis.

Response

As outlined in Section 7.3.3 of the Environmental Impact Statement, Sydney Metro's scope to deliver place outcomes would relate to the physical infrastructure to be delivered as part of the project. Any additional integrated and precinct developments would be subject to separate approval.

A range of stakeholders would have a role in delivering place outcomes across the project corridor and at station precincts. The project would provide opportunities for placemaking at the stations, such as public domain improvements, and act as a catalyst for future development in the station precincts.

At all off-airport stations, Sydney Metro would deliver public domain elements and work with other parts of Transport for NSW and other key stakeholders such as Western Sydney Planning Partnership who would deliver transport integration elements beyond the scope of the project. At the on-airport

stations, Sydney Metro would work with Western Sydney Airport to ensure the required transport integration elements are effectively delivered to support the project.

A new mitigation measure has been developed (OLU2) which outlines that Sydney Metro would continue to consult with key stakeholders during design development of the station interchanges and precincts.

Transport integration

Issues raised

Council queried how the project would encourage urban development and change public transport provision around Airport Business Park Station, Airport Terminal Station and Aerotropolis Core Station. To ensure integrated land use and transport strategies around Western Sydney International, Council recommended:

- development of an integrated land use and transport implementation plan with emphasis on bus and active transport network within the station precincts and surrounding areas, in consultation with councils, Western Parkland City Authority and Western Sydney Airport
- development of the station precinct to complement the planned land use for Aerotropolis and be responsive to the needs of the future community.

Response

Sections 7.3.3 and 7.3.4 of the Environmental Impact Statement describe Sydney Metro's approach to placemaking and future precinct integration respectively and describe how Sydney Metro would deliver public domain elements and work with Transport for NSW and other key stakeholders to deliver transport integration elements, including those of bus and active transport options.

Development of an integrated land use and transport implementation plan is beyond the scope of the project and this strategic and master planning would be undertaken by the Western Parkland City Authority through the development of the Aerotropolis.

Sydney Metro has and would continue to consult with key stakeholders in relation to integrated land use and transport planning. Mitigation measure OT1 requires interchange access plans to be prepared in consultation with relevant authorities including Western Parkland City Authority and local councils to ensure adequate pedestrian and cycle facilities and other transport interchange infrastructure are provided at each station precinct.

At the on-airport stations, Sydney Metro would continue to work with Western Sydney Airport to ensure the required transport integration elements are effectively delivered to support the project. The on-airport stations would be designed to be consistent with the design and layout being developed for the station precincts within Western Sydney International, in consultation with Western Sydney Airport. The broader on-airport precincts associated with the two stations within Western Sydney International would be delivered by others as part of the overall development of Western Sydney International.

A new mitigation measure has been developed (OLU2) which outlines that Sydney Metro would continue to consult with key stakeholders during design development of the station interchanges and precincts.

Placemaking

Issues raised

Council recommended:

- design prioritises affordability while ensuring high quality place-making and connection to existing natural assets, including the Western Sydney Parklands and waterways
- stations be equipped to support the transiting passengers to other parts of Sydney with adequate support staff, signage, interchanges, guidance, resting and refreshment facilities to manage the additional demand and passenger load
- consideration be given to arrangements in the event of plane delays and overcrowding
- stations have boarding areas, ramps, access, ticketing and information that are accessible to all passengers.

Response

Place outcomes for the project would ensure stations and interchanges are attractive, safe and functional, and allow for the gathering and movement of people, while also being consistent with the aspirations of the places surrounding them. Within station and interchange areas, Sydney Metro would also explore opportunities for activation, retail and other specialised spaces for the customer and community.

The project would also be designed to meet the following performance outcomes as outlined in Table 7-1, requiring that:

- each station and station plaza is provided with sufficient customer capacity to achieve a minimum level of service for 2056 forecast demands
- stations and interchanges are fully accessible and compliant with the *Disability Discrimination Act 1992 (Cth)* and the *Disability Standards for Accessible Public Transport*.

The approach to design and placemaking for the project would consider current best practices for urban design and placemaking, including the Government Architect of NSW's Better Placed policy and the principles of Designing with Country. These frameworks and principles are aimed at creating a clear approach to the design of architecture, public places and environments for the future as well as promoting incorporation of Aboriginal leadership and advice in the design of projects. As outlined in Section 5.3.2, community and stakeholder engagement along with the establishment of a Design Advisory Panel (prior to project approval) and a Design Review Panel (if the project is approved) would ensure high quality standards throughout the whole design process.

Consideration has been given to respond to the operational requirements of servicing Western Sydney International including in the event of plane delays and potential overcrowding on the metro service. As outlined in Section 7.7 of the Environmental Impact Statement, the project would deliver a 'turn up and go' service consistent with customer expectations and the needs of Western Sydney International. It is anticipated that the project would initially operate up to three carriages per train with a service frequency of up to 12 trains per hour in the peak. Depending on the demand, there may be occasions when standby trains are deployed into service to increase capacity. The project would be capable of extending operating hours to cater for special events. Sydney Metro – Western Sydney Airport has the ability to operate as a 24-hour service. The operation of the project combined with alternative services in the evening and early morning where required, would ensure there is a 24-hour transport service to respond to the operational requirements of Western Sydney International.

A new mitigation measure has been developed (OLU2) which outlines that Sydney Metro would continue to consult with key stakeholders during design development of the station interchanges and precincts.

Public art

Issues raised

Council recommended consideration of how the project can be activated through innovative design and art that actively invites the public into the space and provides opportunity for future programmed activation.

Council recommended integration of public art to enhance the overall character and provide alternative points of interest along the metro line, and engagement of a public art consultant to prepare a public art strategy for the project.

Response

Mitigation measure SE1 requires consultation with the local community and project stakeholders to identify and deliver opportunities for facilitating local creative and cultural activities and opportunities for temporary public art and targeted community events and programs in affected locations during construction.

The Design Guidelines for the project (Appendix D) include a principle to ensure public art is integrated within stations, plazas and corridors to elevate customer experience, enhance placemaking and help integrate the station within the local area.

Badgerys Creek Road shared path

Issues raised

Council recommended provision of a shared path along Badgerys Creek Road between Pitt Street and the proposed Aerotropolis Core Station access road.

Response

Provision of a shared path along Badgerys Creek Road is beyond the scope of the project, however the project would be designed so that any potential future provision of a shared path by others would not be precluded.

Where confirmed information is available, consideration of proposed and future connections in the vicinity of stations which may be delivered by others would be made as part of implementing mitigation measure OT1. This measure requires that interchange access plans would be prepared in consultation with relevant authorities including Liverpool City Council to ensure adequate pedestrian and cycle facilities and other transport interchange infrastructure is provided at each station precinct.

5.3.5 Transport

Interface agreement

Issues raised

Council recommended creation of an interface agreement with Sydney Metro that would outline ownership and responsibility for maintenance of access roads and public transport facilities at the proposed stations in the Liverpool local government area (LGA).

Response

Sydney Metro are working with Council to identify the need for an interface agreement. Should one be needed, the interface agreement would set out arrangements for how issues related to ongoing consultation and interfaces with Council are addressed.

Road works

Issues raised

Council recommended works within the road reserve be conducted/managed appropriately including using proper signage, obtaining relevant permits and/or approvals, preparation of traffic control plans and advising Council of any interruptions to transport services.

Response

The Construction Traffic Management Framework (refer to Appendix G of the Environmental Impact Statement) includes a range of construction site traffic management requirements, such as preparation of traffic control plans and implementation of traffic control techniques. A Traffic and Transport Liaison Group would operate to ensure stakeholders most affected are aware of the proposed construction activities, upcoming works and related traffic and transport implications. Liverpool City Council would be included in this group as relevant and the development of traffic management measures would be carried out in consultation with the Traffic and Transport Liaison Group.

5.3.6 Noise and vibration

Spatial data

Issues raised

To assist in understanding impacts on future receivers, Council requested spatial data to identify land in or adjacent to the rail corridor likely to be adversely affected by rail noise or vibration.

Response

Sydney Metro will provide the requested spatial data to Liverpool City Council.

Construction hours

Issues raised

Council recommended construction works occur within standard construction hours unless otherwise approved by Council.

Response

General construction activities would occur during standard construction hours. Activities which may be required to occur outside standard construction hours are outlined in Section 8.9.5 of the Environmental Impact Statement. Chapter 10 (Noise and Vibration) of the Environmental Impact Statement includes an assessment of construction noise impacts associated with activities that may be undertaken outside of standard construction hours.

Further review of all potential out of hours construction activities identified in Chapter 8 (Project description – construction) of the Environmental Impact Statement would be undertaken during design development and construction planning and would include consideration of the justification, duration and timeframes for out of hours work as well as mitigation measures that would be implemented to address any potential impacts. This information would be documented in Construction Noise and Vibration Impact Statements as required.

The approach to out of hours work would also be in accordance with an Out-of-Hours Work Protocol to guide the assessment, management, and approval of works outside standard construction work hours. The protocol would ensure that out of hours works are managed effectively during construction, to reduce incidents and minimise impacts on the community. The protocol would be consistent with the Construction Noise and Vibration Standard (Appendix F).

The project has been declared critical State significant infrastructure and if approved, would be delivered in accordance with the approval issued by the Minister for Planning and Public Spaces. That approval would include conditions of approval relating to construction works outside of standard construction hours.

Mitigation, management and monitoring

Issues raised

Council raised the following comments:

- construction noise is predicted to exceed NMLs which may significantly impact upon the nearest receivers
- more detailed assessments, appropriate mitigation measures and a Construction Noise and Vibration Management Plan should be prepared prior to further consideration of the project
- the environmental assessment process is highly fragmented and it is difficult to determine the extent of noise and vibration impacts
- an Operational Environmental Management Plan, including operational noise mitigation, should be prepared and submitted to Council for review.

Response

The noise and vibration assessment undertaken for the Environmental Impact Statement comprises a range of performance outcomes and mitigation measures as outlined in Table 7-1 and Table 7-2. In addition, the Construction Noise and Vibration Standard (Appendix F) provides a prescriptive basis for noise management during project construction.

The Construction Environmental Management Framework (Appendix E) states that Detailed Construction Noise and Vibration Impact Statements would be prepared for noise intensive construction sites or activities including works undertaken outside of standard construction hours and that Construction Noise and Vibration Management Plans would be prepared and implemented. All feasible and reasonable environmental management measures would also be implemented in accordance with the Construction Noise and Vibration Standard.

The noise assessment undertaken to date is consistent with the Secretary's Environmental Assessment Requirements, however it is also acknowledged that the framework described above does include a number of documents that assess noise predictions and recommend management approaches. This is standard practice on State significant infrastructure projects of this nature.

Additional acoustic assessment would be undertaken during detailed design in consideration of the predictions of the Environmental Impact Statement, and to ensure the application of appropriate mitigation measures.

Mitigation measure ONV1 requires an Operational Noise and Vibration Review to be prepared during design development which would consider existing and potential future land use to establish project

noise trigger levels. The EPA would be consulted during preparation of the Operational Noise and Vibration Review.

5.3.7 Biodiversity

Kemps Creek construction power route

Issues raised

Council raised concern that few details are provided for the Kemps Creek construction power route and associated biodiversity reports do not consider this power route.

Response

Section 8.9.10 of the Environmental Impact Statement provides a description of the indicative power supply routes to be provided for construction of the project. High voltage construction power would be provided to the Western Sydney International tunnel portal site to support tunnelling activities via a new connection from the existing Kemps Creek substation located to the east at Devonshire Road, Kemps Creek. The indicative Kemps Creek construction power route is shown in Figure 8-41 of the Environmental Impact Statement, noting the exact route would be confirmed during design development in consultation with the relevant utility provider.

Trenching works would generally be carried out within the road reserve and existing power distribution easements. Where the power route crosses South Creek and Badgerys Creek, horizontal directional drilling would be undertaken to avoid surface impacts on riparian vegetation. Within the airport site, the indicative construction power route generally follows internal roads or temporary haulage roads for the project.

As detailed in Section 11.3.1 of the Environmental Impact Statement, the biodiversity assessment did not cover the project area to the southeast of Western Sydney International as this area is covered by the South West Growth Centre Strategic Assessment. Impacts on matters of national environmental significance (MNES) and Commonwealth land protected by the EPBC Act in this area have already been assessed and approved as part of this strategic assessment process.

On-airport Environmental Conservation Zone

Issues raised

Council raised the following concerns:

- there is limited information detailing how the proposed permanent spoil placement area on-airport would avoid impacts on the Badgerys Creek Environmental Conservation Zone (ECZ)
- on-airport impacts considered in Technical Paper 3 – Biodiversity Development Assessment Report are restricted to the Stage 1 Construction Impact Zone and do not consider the adjacent ECZ.

Council requested further details regarding activities associated with the permanent spoil placement area, potential impacts on the ECZ and proposed mitigation measures, and recommended additional mitigation measures be included to support the conclusion of these assessments.

Response

The airport construction support site, which includes the potential permanent spoil placement areas, has been located outside the ECZ consistent with the intent of the Airport Plan and recognising the environmental values of Badgerys Creek and associated remnant native vegetation.

In relation to protecting the ECZ, a riparian buffer of 40 metres (measured from top of bank) was identified, consistent with the NSW waterway guidelines and BAM and reflecting that Badgerys Creek is a 4th order waterway. In addition, to further minimise edge effects and indirect impacts associated with noise, light and weeds on surrounding biodiversity values, a 20 metre buffer was identified around the outer limit of remnant native vegetation adjacent to Badgerys Creek, including vegetation that lay outside the 40 metre riparian buffer already identified. These buffers are shown on Figure 4-21 of Appendix J (EPBC Act draft assessment of on-airport proposed action) of the Environmental Impact Statement. In some instances, parts of the proposed riparian buffer and the proposed remnant native vegetation buffer extend into the airport construction support site.

The layout of the airport construction support site, which accommodates the permanent spoil placement area and related activities, as well as associated environmental protection control features

such as sedimentation ponds, has been designed to ensure these buffers are not impacted. The known locations of threatened flora are noted; however, direct or indirect impacts are not considered likely to occur on any threatened species not already considered in the Revised Biodiversity Development Assessment Report (Appendix G).

The Revised Biodiversity Development Assessment Report has assessed impacts within the construction footprint outside the Stage 1 Construction Impact Zone including indirect impacts on ECZ. Mitigation measure FF6 has been revised so that it will also apply to the on-airport construction support site (potential permanent spoil placement area) which is located adjacent to the ECZ.

Mitigation measures FF1, FF6, OFF1 and WQ1 would manage potential indirect biodiversity impacts of the project, including water quality impacts on adjacent vegetation, reduced viability of habitat due to edge effects, loss of shade and shelter and loss of breeding habitats and managing shading and artificial light impacts to remnant bushland in intact condition. Additional mitigation measures to manage these potential impacts are provided in the Construction Environmental Management Framework (Appendix E).

Key Threatening Processes

Issues raised

Council raised concern that the assessment of indirect impacts and Key Threatening Processes in Technical Paper 3 – Biodiversity Development Assessment Report is heavily reliant upon mitigation measures, but the measures that have been relied on are not included in Table 11.2 of Technical Paper 3 – Biodiversity Development Assessment Report. Details therefore appear to be restricted to the high-level information included within the Construction Environmental Management Framework.

Response

Indirect Key Threatening Process impacts would be managed through the development of a Flora and Fauna Management Plan in line with the Construction Environmental Management Framework (Appendix E) and mitigation measure FF1. In response to Council's submission, a new mitigation measure (FF10) has been included with specific measures to deal with Key Threatening Processes including the management of weeds and pathogens.

Dam dewatering

Issues raised

Council requested further details regarding dam dewatering protocols to minimise harm to fauna, including whether any native vegetation or fauna habitat would be impacted. Council recommended that if impacts on biodiversity are likely to occur, these should be considered as part of the assessment, noting that Kemps Creek contains known and potential habitat for several threatened flora species.

Response

Two new mitigation measures (FF8 and FF9) have been included which outline that Dewatering Plans would be prepared and implemented for the dewatering of rural dams that would be impacted as a result of the construction of the project. This would include measures to manage the transfer of native aquatic fauna, if required, prior to dewatering and removing of dams.

Cumberland Plain Woodland

Issues raised

Council recommended replanting an equal or greater quantity of Cumberland Plain Woodland species within the vicinity of where the endangered ecological community is proposed to be removed from.

Response

A new mitigation measure (OLV7) has been included which requires the landscape design for the project to use native species from the relevant native vegetation communities within the local area for tree planting programs. As per the operational performance outcomes for biodiversity outlined in Table 7-1, native vegetation would be re-established in accordance with the National Airports Safeguarding Framework Principles and Guidelines including *Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports* (Australian Government, 2014). While native species would be used for landscaping, the species may not include Cumberland Plain Woodland.

A new mitigation measure (FF11) has also been included which outlines that a native vegetation seed collection and salvage program would be developed prior to the commencement of construction and implemented during construction. The seed collection and salvage program would target native species prioritising the Cumberland Plain Woodland species to be utilised in landscaping for the project where possible. Opportunities for use of collected and salvaged seed outside of the project would also be investigated.

A revised performance outcome has been included in response to submissions which outlines the number of trees within the project area is increased at a ratio of 2:1 (for vegetation removal not subject to biodiversity offset); and tree canopy coverage is increased, using a range of local species, subject to the constraints on tree planting associated with safe airport operations.

The biodiversity offsets and credit report for the project is detailed in Section 12 of the Revised Biodiversity Development Assessment Report (Appendix G). The residual impacts of the project on Cumberland Plain Woodland that are not able to be managed through mitigation would be offset in accordance with the BAM and the biodiversity offset strategy described in Section 11.7.4 of the Environmental Impact Statement.

The project is committed to meeting its credit requirements for Cumberland Plain Woodland, which would ensure the management and protection of Cumberland Plain Woodland in accordance with the BAM. These credits would be sourced from available existing credits created from secure conservation agreements protecting Cumberland Plain Woodland and/or through the equivalent credit payment into the NSW Biodiversity Conservation Fund for the targeted protection and management of Cumberland Plain Woodland in accordance with the BAM and BC Act.

5.3.8 Non-Aboriginal heritage

Kelvin

Issues raised

Council recommended no work occur within the boundaries of the State Heritage listed curtilage of Kelvin without first consulting with Heritage NSW and adopting proper and effective heritage management practices through an approved Construction Heritage Management Plan.

Response

No work is proposed within or adjacent to the boundaries of the State Heritage listed curtilage of Kelvin, as shown in Figure 12-4 of the Environmental Impact Statement.

Table 12-6 of the Environmental Impact Statement indicated that potential heritage impacts on the State Heritage listed Kelvin item would be limited to a minor heritage setting impact. The nearest works to the State Heritage listed curtilage of Kelvin are approximately 600 metres away. Mitigation measure NAH3 requires archival recording of the setting impact to the State Heritage listed Kelvin item.

Mitigation, management and monitoring

Issues raised

Council recommended that where stations are located within proximity of listed or potential heritage items which are being impacted by the project, a heritage interpretation plan be developed to integrate the history of the area into the design of the associated railway station.

Response

As per the operational performance outcomes for non-Aboriginal heritage outlined in Table 7-1, design of the project would incorporate non-Aboriginal heritage interpretation. Mitigation measure ONAH4 also requires a heritage interpretation strategy to be prepared for the project identifying key stories and interpretive opportunities related to non-Aboriginal heritage. The strategy would address historic and contemporary heritage and community values and would identify innovative and engaging opportunities for interpretation.

5.3.9 Aboriginal heritage

Mitigation, management and monitoring

Issues raised

Council noted that the requirement for an Aboriginal Heritage Impact Permit is not applicable to the project as it is State significant but also emphasised the importance of testing in identified high sensitivity zones prior to construction.

Council recommended that archaeological works be monitored by Registered Aboriginal Parties, led by an experienced archaeologist, and that all finds be recorded.

Council recommended Aboriginal objects be offered to the respective Local Aboriginal Land Council for storage and care. Should this not be possible, objects identified within the Liverpool LGA should be provided to the Liverpool Regional Museum for storage on behalf of the Aboriginal community.

Response

Further assessment of areas of Aboriginal heritage sensitivity has been undertaken since public exhibition of the Environmental Impact Statement as summarised in Section 6.8.3 and included as part of the Revised Aboriginal Cultural Heritage Assessment Report (Appendix H). The additional field investigations and reporting have been undertaken in accordance with former mitigation measure AH3 and in consultation with Registered Aboriginal Parties. Revised mitigation measures AH1 and AH2 detail the requirements for further survey (including test excavation), consultation and management of artefacts. Mitigation measure AH5 has been revised to require that recovered Aboriginal objects are appropriately secured and under the care of the archaeological consultant while options for their long-term management, as determined through consultation with Registered Aboriginal Parties, are investigated.

As per the operational performance outcomes for Aboriginal heritage outlined in Table 7-1, the design of the project would incorporate Aboriginal heritage interpretation and Aboriginal cultural design principles in consultation with Aboriginal knowledge holders.

5.3.10 Flooding, hydrology and water quality

Controlled activity

Issues raised

Council recommended that while exemptions may apply to State significant infrastructure projects for controlled activities such as construction of infrastructure on waterfront land, consideration of whether there are any other applicable requirements which apply to the proposed development under the *Water Management Act 2000* should be undertaken.

Response

As noted in Appendix B (Statutory approvals framework) of the Environmental Impact Statement, as critical State significant infrastructure, the project is exempt from the application of certain provisions of the *Water Management Act 2000*, namely a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval, if required) under section 91.

Nevertheless, as a matter of good environmental assessment practice, the relevant provisions of *Water Management Act 2000* were considered in both Technical Paper 6 – Flooding, hydrology and water quality and Technical Paper 7 – Groundwater. A new mitigation measures (WQ3) has been identified which outlines that the design and construction of the project would take into account the former NSW Office of Water's Guidelines for controlled activities on waterfront land. This would enable the mitigation of potential impacts on water quality.

Discharge of water during operation

Issues raised

Council recommended the project evaluate the quality and quantity of pollutants that may be introduced into the water cycle by source and discharge point.

Response

As per the operational performance outcomes for water quality provided in Table 7-1, drainage from the project would be designed in accordance with local council requirements for managing urban stormwater quality and quantity. Water discharged from the project would contribute towards achieving ANZECC guideline water quality trigger values for slightly disturbed ecosystems, or meet any water quality criteria determined in consultation with the EPA (off-airport) or in accordance with the Airports Regulations (on-airport).

As outlined in the new mitigation measure WQ2 and revised mitigation measure OWQ7, Sydney Metro is committed to water treatment plants being designed so that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default guidelines for 95 per cent species protection and 99 per cent species protection level for toxicants that bioaccumulate, unless other discharge criteria are agreed with relevant authorities. Consistent with the requirements of the Construction Environmental Management Framework (Appendix E), detailed procedures for the treatment, testing and discharge of groundwater from the site would be included in a Groundwater Management Plan (or equivalent).

Mitigation measure WQ1 requires that a surface water monitoring program would be developed in consultation with EPA and other relevant stakeholders. Mitigation measures GW5 and GW6 require the development and implementation of a groundwater monitoring program to inform development of the detailed groundwater model and preparation of a Groundwater Management Plan to manage potential construction impacts, including target criteria for discharge, trigger values and corrective actions.

Mitigation, management and monitoring

Issues raised

Council recommended:

- flood mitigation measures be incorporated in the design to minimise adverse impact of flooding during construction at the vicinity of waterways
- design avoid obstruction of the existing overland flow paths and minimise flow diversion
- Water Sensitive Urban Design principles be incorporated in the design to reduce pollutant load and maintain waterway health
- the design meet the requirements of the relevant ANZECC water quality guidelines and the Liverpool Development Control Plan 2008.

Response

The project has been designed to meet the applicable flood criteria, including consideration of Government's latest climate change projections.

Mitigation measure HYD1 requires review of site layout and staging of construction works to avoid or minimise obstruction of overland flow paths and limit the extent of flow diversion required.

Impacts would be minimised through the implementation of mitigation measure OWQ2, which commits to ensuring drainage and water treatment is designed in accordance with Water Sensitive Urban Design requirements specified in local council, Transport for NSW and on-airport standards. Further, mitigation measure OWQ6 requires the investigation of Water Sensitive Urban Design features where reasonable and feasible.

If the project is approved, a Construction Environmental Management Plan (including flooding, hydrology and water quality management) would be prepared in accordance with the Construction Environmental Management Framework (Appendix E), any conditions of approval for the project, and the commitments made within the Environmental Impact Statement and this report.

5.3.11 Soils and contamination

Assessment methodology

Issues raised

Council raised concern that the contamination assessment:

- did not fulfil all requirements of the *Contaminated Land Management Act 1997* and the Environmental Planning Policy (SEPP) No. 55 – Remediation of Land and recommends these requirements are addressed
- did not include a review of Land Titles records, Council records or SafeWork NSW records for current and historical dangerous goods licenses.

Council recommended that, where required, a Detailed Site Investigation and Remedial Action Plan be prepared by a suitably qualified professional.

Response

The project has been declared critical State significant infrastructure. As noted in Appendix B (Statutory approvals framework) of the Environmental Impact Statement, the provisions of environmental planning instruments such as SEPP 55 do not apply to critical State significant infrastructure projects. However, as a matter of good environmental assessment practice, the contamination assessment presented in Technical Paper 8 – Contamination was undertaken in accordance with the provisions of SEPP 55. The assessment approach was aimed at characterising risk for each of the sites and areas of environmental concern, rather than explicitly seeking to provide an exhaustive site history. The information provided in the Environmental Impact Statement is sufficient to determine a preliminary assessment of risk to guide further assessment and/or remediation as outlined in the mitigation measures.

The assessment recommends a tiered, risk-based approach for managing potential contamination including the Soil and Water Management Plan, unexpected finds protocol, detailed investigations for areas of higher risk, and remediation where required. For sites where potential contamination risk has been identified as medium or high, a further review of data has been proposed in accordance with mitigation measure SC1. Where a high risk of contamination remains following the outcomes of mitigation measures SC1, subsequent intrusive Detailed Site Investigations and remediation would be undertaken where required, in accordance with mitigation measures SC2 and SC3, respectively.

If the project is approved, a Construction Environmental Management Plan (including contamination management) would be prepared in accordance with the Construction Environmental Management Framework (Appendix E), any conditions of approval for the project, and the commitments made within the Environmental Impact Statement and this report.

5.3.12 Landscape and visual

Landscaping, revegetation and tree canopy

Issues raised

Council recommended:

- development of a detailed landscape plan
- a net increase in native vegetation, specifically trees to strengthen the existing landscape character and reduce the effects of the urban heat island
- a tree replacement ratio of 3:1
- Sydney Metro outline a comparison between the extent of vegetation to be removed and the proposed canopy coverage to be incorporated as part of the project
- new fill batters incorporate low maintenance native plantings including trees, where possible, to soften the transition from the proposed metro line to the existing ground plane
- establishment of groundcovers, hedges and grasses as part of a layered planting palette around the proposed metro alignment
- proposed vegetation be included through visual representation as part of any landscape and visual impact assessment
- consideration of the evolving nature of landscape within a landscape and visual impact assessment which considers the continuing change in land use over several years after completion.

Response

Technical Paper 9 – Landscape and visual provides a landscape and visual impact assessment of the project and includes photomontages of indicative views towards proposed stations including landscaping.

A revised mitigation measure (OLV7) is proposed and commits to the landscape design for the project:

- incorporating salvaged native trees (including tree hollows and root balls), to enhance fauna habitat in suitable locations, including riparian corridors, where practicable
- using native species from the relevant native vegetation communities within the local area for tree planting programs.

As per the revised operational performance outcomes for design, place and movement outlined in Table 7-1, the project would contribute to greener places through supporting the enhancement and provision of green infrastructure by increasing the number of trees within the project area at a ratio of 2:1 (for vegetation removal not subject to biodiversity offset) and increasing tree canopy coverage using a range of local species, subject to the constraints on tree planting associated with safe airport operations.

Mitigation measure OLV6 requires proposed engineering batters and water management measures to be designed to integrate with the existing landforms and natural features. Incorporation of low maintenance native plantings including trees on these batters to soften the transition from the proposed metro line to the existing ground plane would be considered during design development.

Mitigation measure OLV3 requires investigation of opportunities to provide vegetation screening of the stabling and maintenance facility during design development and mitigation measure OLV4 requires landscape screening to be provided along the corridor including restoring vegetation along the creeks to contain local views, in accordance with the Design Guidelines (Appendix D), to minimise adverse visual impacts where feasible.

5.3.13 Social and economic

Involving local communities in construction

Issues raised

Council recommended setting targets for apprentices/trainees and local Western Sydney based employees, embedding local training initiatives and identifying Indigenous only roles.

Response

Initiatives for workforce development and industry participation, including local works and suppliers, and the protection and promotion of Aboriginal and non-Aboriginal heritage and culture are listed in Table 17-1 of Chapter 17 (Sustainability, climate change and greenhouse gas) of the Environmental Impact Statement. These include the following initiatives:

- industry and jobs participation – increase opportunities for employment of local people, participation of small and medium enterprises, including recognised Aboriginal businesses, and support industry to compete in home and global markets through active participation in client-led programs
- workforce skills development – enable targeted and transferable skills development in areas with local and national skills shortages, support changing job roles and increased skill requirements, and embed transferable skills in the workforce.

Sense of place and tourism

Issues raised

Council recommended consideration of opportunities to:

- provide a sense of place and engaging activations and experiences as outlined in Council's Destination Management Plan, including preserving the heritage character of Kelvin Park Group
- facilitate future agritourism potential
- provide an inviting and consistent experience and blend into the existing landscape to create a unique and memorable familiarity for visitors.

Response

As per the operational performance outcomes for non-Aboriginal heritage outlined in Table 7-1, design of the project would incorporate non-Aboriginal heritage interpretation, including for Kelvin Park Group.

The Design Guidelines for the project (Appendix D) outline the urban design principles that have been considered during development of the project. A key principle is placemaking, which would support and contribute to the delivery of unique, attractive and vibrant urban centres, streets and spaces that provide a sense of connection and identity for local communities and visitors.

At all off-airport stations, Sydney Metro would deliver public domain elements which would ensure stations and interchanges are attractive, safe, functional and allow for the gathering and movement of people, while also being consistent with the aspirations of the places surrounding them. Within station and interchange areas, Sydney Metro would also explore opportunities for activation, retail and other specialised spaces for the customer and community (subject to separate approval).

The final approach and design to placemaking for the project would be undertaken with consideration of current best practices for urban design and placemaking including consideration of the Government Architect of NSW's Better Placed policy, which is aimed at creating a clear approach to the design of architecture, public places and environments for the future.

5.3.14 Hazards and risk

SEPP 33 – Hazardous and Offensive Development

Issues raised

Council raised concern that a risk screening procedure or preliminary hazard analysis in accordance with *State Environmental Planning Policy No. 33- Hazardous and Offensive Development* (1992 EPI 129) has not been undertaken to determine whether the project constitutes a potentially hazardous industry.

Response

The project has been declared critical State significant infrastructure and therefore the provisions of SEPP 33 do not apply. The Secretary's environmental assessment requirements did not require a risk screening procedure to be undertaken. Chapter 23 (Hazard and risk) of the Environmental Impact Statement includes an assessment of environmental hazards and risks that could arise during construction and operation of the project, and management strategies to address these hazards and risks. The assessment focused on hazards and risks with the potential to adversely affect the quality of the surrounding environment, land uses and communities, with consideration of a number of relevant guidelines, including *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011) (Applying SEPP 33).

Mitigation measures HR1 and OHR1 require that all hazardous substances used for construction and operation would be stored and managed in accordance with the *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover NSW, 2005), Applying SEPP 33, the *Work Health and Safety Act 2011* (Commonwealth and NSW) and the requirements of the NSW *Environmentally Hazardous Chemicals Act 1985*.

Regulated systems

Issues raised

Council recommended confirmation of whether regulated systems such as warm water and/or cooling water systems would be installed as part of the project in accordance with relevant policy and guidelines.

Response

If the project is approved, the details of cooling water systems and warm water systems would be considered (including consideration of any relevant compliance and regulatory requirements) during design development.

5.3.15 Cumulative impacts

Mitigation, management and monitoring

Issues raised

To ensure coordination of the construction and operational aspects of the projects, Council recommended:

- establishment of a project working group made up of Transport for NSW, Sydney Metro, Western Sydney Airport, Penrith City Council and Liverpool City Council to discuss impacts of major transport projects including the future M12 Motorway, Western Sydney International and Mamre Road upgrade
- community and stakeholder consultation to manage potential cumulative impacts of other significant construction activities in the local area including the future M12 Motorway.

Response

Chapter 24 (Cumulative impacts) and Chapter 27 (Synthesis) of the Environmental Impact Statement discuss how potential cumulative construction impacts would be managed in accordance with the environmental management framework, performance outcomes and mitigation measures. Mitigation measure CL1 requires the development of a Cumulative Construction Impacts Management Plan to detail coordination and consultation with stakeholders (as relevant) to manage the interface of projects under construction at the same time.

As outlined in Section 5.3.5, the Construction Traffic Management Framework (refer to Appendix G of the Environmental Impact Statement) includes the establishment of a Traffic and Transport Liaison Group, which would include the representation of local councils and other key stakeholders. As per the construction performance outcomes for cumulative impacts outlined in Table 7-1, cumulative impacts would be managed through coordination of construction activities and communication processes with nearby projects (Western Sydney International, M12 Motorway, The Northern Road, St Marys Intermodal and St Marys Commuter Car Park Expansion).

Sydney Metro has and would continue to consult with Transport for NSW, Western Sydney Airport, and Penrith City and Liverpool City Councils, including in relation to potential cumulative impacts from surrounding large infrastructure projects and integrated transport planning. Community and stakeholder consultation undertaken for the project to date, as well as details of future consultation, are outlined in Chapter 2 (Stakeholder and community consultation) and Chapter 5 (Stakeholder and community engagement) of the Environmental Impact Statement.

An Overarching Community Communications Strategy has been prepared (Appendix C) to guide Sydney Metro's approach to stakeholder and community liaison including engagement with communities, stakeholders and businesses. The Overarching Community Communications Strategy outlines that Sydney Metro would ensure coordination with interfacing projects to manage community and stakeholder issues.

5.3.16 Environmental management framework

Mitigation, management and monitoring

Issues raised

Council recommended preparation of a Construction Management Plan to address all environmental aspects of the construction phase, including the following:

- Construction Noise and Vibration Management Plan
- Soil and Water Management Plan
- Construction Environmental Management Plan
- Operational Environmental Management Plan.

Response

The Construction Environmental Management Framework (Appendix E) includes requirements to manage all relevant environmental aspects during construction. Sydney Metro would prepare and implement any construction management plans in accordance with the Construction Environmental

Management Framework and any requirements of the critical State significant infrastructure conditions of approval and Airport Plan (as varied).

The Construction Environmental Management Framework describes the approach to environmental management during construction. The framework provides the basis for environmental management and informs the development of Construction Environmental Management Plans (by the construction contractors for off-airport works and by Sydney Metro for on-airport works) which would be developed prior to construction. The framework identifies the environmental, stakeholder and community management systems and processes that would be applied during construction. Specifically, it lists the requirements to be addressed by the construction contractors and Sydney Metro in developing the Construction Environmental Management Plans, sub-plans and other supporting documentation for each specific environmental aspect. The Construction Environmental Management Framework also identifies protocols for environmental monitoring, inspections, auditing and reporting.

The Construction Noise and Vibration Standard (Appendix F) defines how construction noise and vibration impacts are to be managed for Sydney Metro projects, in accordance with guidance documents such as the *Interim Construction Noise Guideline*. The standard identifies the requirements and methodology to develop Construction Noise and Vibration Impact Statements.

The requirement to prepare a Soil and Water Construction Environmental Management Plan is detailed in Section 12 of the Construction Environmental Management Framework and is required by mitigation measure SC1.

Environmental performance during operation of the project would be managed by the implementation of an operational environmental management plan or system. The plan would detail how the performance outcomes and mitigation measures would be implemented and achieved during operation and would specify the environmental management practices and procedures to be followed.

Compliance monitoring

Issues raised

Council noted that the Department of Planning, Industry and Environment would have primary responsibility for assessing compliance with conditions of approval in relation to environmental emissions.

Council recommended implementation of a comprehensive compliance monitoring initiative that incorporates both qualitative and quantitative measures.

Council recommended that data collection using quantitative methods for the duration of construction and operational phases of the project would assist in determining compliance with the approval and encourage environmental best practice.

Response

Compliance monitoring, including the collection of data during construction and operation, would be undertaken in accordance with the environmental management framework detailed in Chapter 25 (Environmental management and mitigation) of the Environmental Impact Statement and the requirements of any conditions of approval.

Environmental management during operation

Issues raised

Council recommended:

- train maintenance occur within an appropriate workshop/building
- adequate environmental controls be established for a train wash bay
- waste storage areas be clearly identified on site plans and located inside buildings.

Response

Environmental performance during operation of the project would be managed via an operational environmental management plan or system as outlined in Section 25.3 of the Environmental Impact Statement. The stabling and maintenance facility would include an infrastructure maintenance shed, train wash facilities which would operate in accordance with the relevant environmental controls and waste storage areas managed in accordance with the relevant guidelines.

Operational infrastructure and maintenance required at the stabling and maintenance facility and for the project generally is detailed in Sections 7.5.1 and 7.7.5 of the Environmental Impact Statement respectively.

5.3.17 Beyond the scope of the Environmental Impact Statement

Future metro extensions

Issues raised

Council recommended further consideration be given to the rail extension from Leppington to Western Sydney International.

Response

A future extension of the existing metropolitan rail network from Leppington to Aerotropolis Core Station (South West Rail Link Extension) is identified in *Future Transport 2056* as a future project for investigation. The project, including the design of Aerotropolis Core Station, has been designed to allow for development of an extension of the existing South West Rail Link. Details of future interchanges with potential future extensions of the metro line would be subject to separate approvals and design development.

5.4 Blacktown City Council

5.4.1 General

Council's submission provided no comments or recommendations.

5.5 Department of Planning, Industry and Environment (Environment, Energy and Science)

5.5.1 Biodiversity

Assessment methodology

Issues raised

EES raised the following comments:

- exclusion of the Large Bent-wing Bat from further consideration in Technical Paper 3 – Biodiversity Development Assessment Report is not adequately justified
- clarification is required as to whether the site of the previously recorded (2013) *Marsdenia viridiflora ssp viridiflora* species on Badgerys Creek Road was found during on-airport surveys
- Table 6.5 of Technical Paper 3 – Biodiversity Development Assessment Report refers to Figure 8 of an expert report undertaken as part of the Cumberland Plain Conservation Plan for *Dillwynia tenuifolia*, but the figure in this expert report does not include the on-airport area
- Technical Paper 3 – Biodiversity Development Assessment Report should document the alternative options considered, such as a 'do nothing' option
- if further biodiversity surveys proposed to be undertaken in Spring 2020 indicate the presence of any large populations of threatened species, all attempts should be made to avoid these populations, prior to the design and construction plans being finalised.

Response

The majority of existing structures within the project footprint are associated with current inhabited residential buildings in a residential setting and therefore are considered to have a low likelihood of providing suitable habitat for the Large Bent-wing Bat. The two dwellings that are currently abandoned are in a semi-rural landscape and provide moderate potential for roosting habitat for this species. Given the dwellings are isolated within large areas of cleared land, some distance from core habitat for the species, and given the absence of records of this species from targeted bat surveys within the project study area or locality, breeding habitats are highly unlikely.

The habitat constraints for breeding as identified in the Threatened Biodiversity Data Collection are not met for this species in the study area so it has been excluded from further assessment in accordance with Section 6.4.1.13 of the BAM.

This further justification of exclusion of the Large Bent-wing Bat has been included in the Revised Biodiversity Development Assessment Report (Appendix G). Mitigation measure FF4 has been revised to require a targeted microbat survey of the Large Bent-wing Bat at structures proposed for demolition or impact. Other human-made structures such as culverts and other under-road structures within the construction footprint would be surveyed for threatened microbats and, if detected, a Microbat Management Plan would be developed by a suitably qualified bat specialist.

The majority of *Marsdenia viridiflora ssp viridiflora* records identified on Badgerys Creek Road, including the record mentioned in the EES submission, are within the Western Sydney International Stage 1 Construction Impact Zone where vegetation is to be cleared and earthworks undertaken to enable development of the airport. These records are not located within the Sydney Metro construction footprint. As a result, they were not considered in Technical Paper 3 – Biodiversity Development Assessment Report.

Reference to the expert report has been removed, noting it does not show the on-airport area, and the Biodiversity Development Assessment Report has been updated with more recent and appropriate references to rounds of surveys conducted on-airport for this species as outlined in the Revised Biodiversity Development Assessment Report (Appendix G).

Discussion of the 'do-nothing' option has now been included in the Revised Biodiversity Development Assessment Report. Chapter 6 (Project alternatives and options) of the Environmental Impact Statement includes discussion of the other options considered during project design development including station precincts, project alignment and ancillary facilities options, and the assessment criteria used in determining preferred options.

A summary of the findings of the additional biodiversity assessment undertaken since exhibition of the Environmental Impact Statement is provided in Section 6.8.1 and the Revised Biodiversity Development Assessment Report. This assessment has confirmed that following the additional Spring surveys there has been a reduction in the project's impacts to threatened species and communities previously assumed to be present within the off-airport areas.

Removal of farm dams

Issues raised

EES raised concern regarding potential impacts on native fauna habitat as a result of the removal and/or relocation of farm dams.

EES recommended project approval be subject to a condition that requires a Dewatering Plan to be prepared which includes a Fauna Relocation Plan to outline a strategy for the transfer of native aquatic fauna prior to dewatering and removing the dams.

Response

Refer to response provided in Section 5.3.7 in relation to dam dewatering.

Construction of viaduct/bridge crossings

Issues raised

EES raised concern regarding potential impacts of works required to support construction of the viaduct close to waterways and riparian vegetation, and requested further details on this potential impact.

Response

The project has been designed to minimise impacts on sensitive environmental receivers through the use of bridges and viaducts over creek lines and Key Fish Habitat at Blaxland Creek, an unnamed tributary of South Creek to the south of Patons Lane and Cosgroves Creek, and through the tunnel beneath the ECZ associated with Badgerys Creek riparian area on-airport.

Construction of the viaduct to cross Blaxland Creek, an unnamed tributary of South Creek to the south of Patons Lane and Cosgroves Creek would result in impacts on vegetation; however, these impacts would be minimised and localised to construction of the viaduct piers and abutments and maintenance access tracks.

A new mitigation measure (OFF2) has been included in response to this submission with the aim to minimise native vegetation removal within the wildlife/riparian corridors. In addition, a new mitigation measure (WQ3) has been included which requires the design and construction of the project to take

into account the former NSW Office of Water's Guidelines for controlled activities on waterfront land. This would enable the mitigation of potential impacts on water quality, including within riparian corridors.

Design of viaduct/bridge crossings

Issues raised

EES raised the following comments:

- concern that Figures 7.4b and 7.4c of the Environmental Impact Statement show the proposed bridge/viaduct crossings of Cosgroves Creek and the unnamed tributary of South Creek to the south of Patons Lane do not completely span the riparian zone along the creeks
- viaducts/bridges should be designed to span the full width of the riparian corridor of these creeks to minimise the clearing/disturbance of existing native vegetation
- request for clarification as to whether the alignment at Patons Lane would be constructed at the surface or on viaduct/bridge.

Response

The metro rail alignment is on viaduct where it crosses Blaxland Creek, the unnamed tributary of South Creek to the south of Patons Lane and Cosgroves Creek (refer to Figure 7-4b and Figure 7-4c in Chapter 7 (Project description – operation) of the Environmental Impact Statement). Figure 3-1 of the Environmental Impact Statement only shows surface and underground sections of the metro alignment and does not show the proposed viaduct and bridge sections. The viaducts span the majority of the riparian corridor of Cosgroves Creek and the unnamed tributary of South Creek to the south of Patons Lane and over Patons Lane.

Mitigation measure OFF1 and new mitigation measure OFF2 outline design requirements for the viaduct/bridge structures to provide for fauna movement opportunities.

East-west regional corridor

Issues raised

EES raised concerns regarding the elevation of the metro alignment on viaduct or in tunnel in the area of the east–west regional corridor and the stabling and maintenance facility and associated infrastructure to avoid potential severance and connectivity impacts on vegetation and habitat impacts on the east–west regional corridor.

Response

An underground tunnel option for the section of the alignment in the area of the east–west regional corridor is not considered feasible because of the need to provide at-grade access to the stabling and maintenance facility and to avoid tunnelling below critical infrastructure associated with the Warragamba to Prospect Water Supply Pipelines (refer to Section 6.6.2 of the Environmental Impact Statement).

The design of the project considers the east-west regional corridor through ensuring wildlife connectivity requirements across the project corridor where security fencing is not required. The east-west regional corridor would be maintained through the provision of:

- bridge structures in the vicinity of Blaxland Creek (rail corridor fencing would not be provided at ground level below the viaduct sections of the alignment to allow for cross-corridor fauna movement)
- a culvert measuring around 1.5 metres in diameter providing connectivity for wildlife at an unnamed watercourse (tributary of Blaxland Creek) between Lansdowne Road and Blaxland Creek
- a culvert measuring around 1.5 metres in diameter providing fauna connectivity around 600 metres north of the Warragamba to Prospect Water Supply Pipelines.

For security purposes, property boundary fencing would be required to be reinstated at the revised property boundary between the project and the DEOH as outlined in Table 9.1 of the Revised Biodiversity Development Assessment Report (Appendix G). This existing fencing is currently a partial barrier to large terrestrial species such as the Eastern Grey Kangaroo. As such any current limitation on opportunities for fauna movement across the east-west regional corridor from existing property

boundary fencing in this location would remain and the project would not further limit habitat connectivity for fauna species.

Mitigation measure OFF1 and new mitigation measure OFF2 outline design requirements for the viaduct/bridge structures to provide for fauna movement opportunities.

Vehicular access to the stabling and maintenance facility would be via Patons Lane and a new access road which would run north from Patons Lane through an area that is already largely cleared of vegetation. The access to the stabling and maintenance facility and the permanent power supply route is not anticipated to impact on the east–west regional corridor connection.

Cumulative impacts

Issues raised

EES raised concern that the cumulative assessment does not consider biodiversity as a key construction issue for The Northern Road, particularly as The Northern Road upgrade is intended to improve connectivity between the Mulgoa Nature Reserve and the DEOH site. EES emphasised the importance that both projects protect and improve connectivity along the east–west regional corridor.

Response

The cumulative assessment has been updated to consider biodiversity as a key construction issue for The Northern Road Upgrade in the Revised Biodiversity Development Assessment Report (Appendix G). This assessment concludes that The Northern Road Upgrade and the project have the potential to impact mapped regional corridors that lead to and from the DEOH site. Measures to manage the potential biodiversity cumulative impact in this area are outlined in Section 8.5.3 of the Revised Biodiversity Development Assessment Report.

Mitigation, management and monitoring

Issues raised

EES provided the following comments and recommendations:

- native vegetation impacts are to be avoided/minimised and vegetation reused where it is removed
- support for the use of bridges and viaducts over riparian areas, provided the structures and associated security fencing are designed to maintain fauna connectivity, including allowing vegetation to grow under the structures
- support for the trenchless installation of the temporary and permanent power supply cables
- project approval should be subject to a condition that requires culvert crossings to be designed appropriately to maintain connectivity and fauna passage
- fauna surveys should be undertaken by a qualified ecologist prior to clearing of vegetation, and potentially impacted native fauna relocated under the supervision of a qualified professional
- project approval should be subject to a condition that requires preparation of a Vegetation Management Plan by a suitably qualified professional and a Flora and Fauna Management Plan to include pre-clearance fauna surveys, relocation of native fauna and a nest box strategy
- request for clarification of the number, location and timing of tree hollow removal and nest box installation
- seeds, juvenile native vegetation and coarse woody debris should be collected and used for project plantings. Project approval should be subject to a condition that requires a seed collection program
- project approval should be subject to a condition that requires a Landscape Plan to be prepared and implemented by an appropriately qualified bush regenerator. The Landscape Plan should include details on factors such as seed collection and the type, species, size, quantity and location of replacement trees
- support for mitigation measures LV1 and LV2; however, these measures should be amended to include the retention of remnant native vegetation and fauna habitat
- a mitigation measure to ensure weeds are managed appropriately should be included

- consultation with local community restoration/rehabilitation groups, Landcare groups, Councils and relevant public authorities should be undertaken if removed native trees cannot be reused
- implement a tree replacement ratio of greater than 1:1 for trees that are not covered by a biodiversity offset strategy
- request for confirmation of the total number, location and species of trees to be removed and replanted as part of the project
- project approval should be subject to a condition outlining the size and species of replacement trees
- connectivity along the watercourses and riparian areas should be maintained and where possible improved, particularly at South Creek, Blaxland Creek and Cosgroves Creek. Detailed plans should be provided to show this.

Response

Section 8.1 of the Revised Biodiversity Development Assessment Report (Appendix G) discusses how the project design and construction planning has sought to avoid and minimise impacts on biodiversity values including vegetation.

Section 7.6.4 of the Environmental Impact Statement describes how the project design has considered fauna connectivity at locations such as the proposed viaduct/bridge structures near Blaxland Creek, Cosgroves Creek, the vegetation corridors at Patons Lane and the unnamed tributary of South Creek to the south of Patons Lane and culvert. Details regarding how connectivity along the watercourses and riparian areas would be maintained would be confirmed during design development.

The project would be designed to meet the following performance outcomes as outlined in Table 7-1 to ensure impacts on terrestrial and aquatic biodiversity are avoided or minimised:

- the number of trees within the project area is increased at a ratio of 2:1 (for vegetation removal not subject to biodiversity offset) and tree canopy coverage is increased using a range of local species to enhance canopy coverage, subject to the constraints on tree planting associated with safe airport operations (as revised since the Environmental Impact Statement)
- no removal of any vegetation within the Thompsons Creek riparian zone or any adjacent areas that are non-certified under the South West Growth Area
- maintain integrity and functionality of rail corridor fencing to minimise wildlife–train collision while providing opportunities for cross-corridor wildlife movement (as revised since the Environmental Impact Statement)
- minimise or where possible avoid impacts on threatened flora and fauna species, and ecological communities listed under the BC Act and EPBC Act
- appropriately size culverts and bridges to maintain fauna habitat connectivity.

Mitigation measure FF1 requires preparation of a Flora and Fauna Management Plan (off-airport) to minimise and manage the clearing of native vegetation and habitat by a suitably qualified and experienced person. The Flora and Fauna Management Plan would outline a staged clearing process and timing for hollow bearing and habitat tree removal, pre-clearing surveys, fauna relocation and the use of native vegetation of local provenance for tree planting programs. The final total number, location and species of trees to be removed and replanted as part of the project would be determined through the vegetation clearing report required by the Revised Biodiversity Development Assessment Report.

A native seed collection and salvage program is currently in development and a new mitigation measure (FF11) has been developed to confirm that this program would be developed and implemented by the project. The seed collection and salvage program would target native species prioritising the Cumberland Plain Woodland species to be utilised in landscaping for the project where possible. Opportunities for use of collected and salvaged seed outside of the project would also be investigated.

A native seed collection and salvage program is preferred over replanting of juvenile native plants due to survival rates and maintenance requirements. Sydney Metro understands that better vegetation replacement outcomes can be achieved through implementation of seed salvage and landscaping across the alignment. Seed collection and salvage provides the opportunity for biodiversity to be

reestablished while safely preserving seeds for the duration of the project, where landscaping may not be able to be re-established for the duration of construction.

EES's in-principle support for installing the power supply at watercourse crossings via directional drilling and the use of bridges and viaducts over key riparian and vegetated areas, provided the structures are designed to maintain fauna connectivity, is noted. The indicative permanent power supply route is shown on Figure 7-42 of the Environmental Impact Statement and is proposed to be located within the Patons Lane road reserve, thereby minimising impacts on existing vegetation.

The metro rail alignment is on viaduct where it crosses Blaxland Creek, the unnamed tributary of South Creek to the south of Patons Lane and Cosgroves Creek (refer to Figure 7-4b and Figure 7-4c in Chapter 7 (Project description – operation) of the Environmental Impact Statement).

As outlined in Section 7.6.5 of the Environmental Impact Statement, for all surface sections of the alignment, the project corridor would be bordered by security fencing. The fencing would prevent public access to the operational rail corridor, preclude native fauna and livestock access and accommodate Sydney Metro's needs in terms of ongoing maintenance access. As per the operational performance outcomes for biodiversity outlined in Table 7-1, the integrity and functionality of rail corridor fencing would be maintained to minimise wildlife-train collision while providing opportunities for cross-corridor wildlife movement.

Security fencing would not be provided below the viaduct sections of the alignment at ground level allowing for wildlife connectivity across the project corridor.

Mitigation measure OFF1 and new mitigation measure OFF2 outline design requirements for the viaduct/bridge structures to provide for fauna movement opportunities.

Other relevant mitigation measures that would be implemented to manage issues raised in EES's submission include:

- FF2 requiring a nest box strategy which would also outline the size, type, number and location of nest boxes required
- FF10 regarding management of weeds.

Mitigation measures LV1 and LV2 are designed to address landscape and visual impacts during construction and as such do not consider biodiversity impacts. Potential native vegetation and fauna habitat impacts would be managed by revised mitigation measure FF1 which requires minimising clearing of native vegetation and habitat (such as avoiding removal of hollow bearing trees and investigating opportunities for salvage and storage of felled native trees for potential use in landscape design), mitigation measure FF2 which requires implementation of a nest box strategy and mitigation measure FF7 which requires protection of fish passage and fish habitat.

Sydney Metro does not propose to remove all exotic or invasive species and replace these with local natives, as some exotic species have amenity and landscape value, contribute to habitat and reduce urban heat.

5.5.2 Flooding, hydrology and water quality

Assessment methodology

Issues raised

EES raised the following concerns:

- the adopted hydraulic modelling tool may not be suitable for the assessment of scouring and sedimentation patterns and morphological changes at piers of viaducts. Morphological changes have not been assessed and there are no proposed mitigation measures to manage this
- the flooding and water quality model calibration and validation is lacking, does not consider model performance bias and focuses on modelling outputs based on adopted design parameters and assumptions
- the flood model should be validated against the Infrastructure for NSW South Creek Sector Review
- lack of consultation with EES on the modelling process and validation as required by the Secretary's environmental assessment requirements.

Response

Technical Paper 6 – Flooding, hydrology and water quality provides details of the hydraulic model developed to assess the project.

Modelling for the assessment of morphological changes would require a different flood modelling tool to the hydraulic model used for the Environmental Impact Statement. However, as outlined in Section 6.1.3 of Technical Paper 6 – Flooding, hydrology and water quality, geomorphic impacts are predicted to be negligible because there would be minimal change to contributing catchment areas and therefore no change to flood flows. The piers have been located out of the main flow paths for each watercourse and the impact would not propagate downstream.

The removal of several farm dams to construct the project is likely to result in a change to the frequency of low flow events. These changes may be counteracted by the inclusion of on-site detention basins which would be designed to Penrith City Council requirements and therefore would be designed to match existing runoff characteristics. Overall the change to storage across the study area is not predicted to be significant.

Ongoing design for viaducts would aim to minimise required structures within mean water flow areas to minimise scour and erosion potential.

The hydraulic model developed to assess the project for the Environmental Impact Statement includes details of model calibration and validation. The assessment references two calibration events and a validation event and considers a comparison of design flood extents predicted by the model against those from the Penrith City Council-adopted flood study (Penrith City Council, 2015). Flood modelling calibration and validation was determined to be as best fit as possible with historic floods scenarios within a hydrological modelling environment. Figure 5-1 to Figure 5-4 present graphs which show plots comparing the gauging data (and historical flood marks) and modelling results to demonstrate the temporal and magnitude bias of model performance. Flood modelling and running simulations are unlikely to give an exact match to real life events however the model is representative and can be relied upon for the impact assessment. The assessment discusses the differences noted and concludes that the flood model was adequate for this assessment.

The flooding assessment undertaken in the Environmental Impact Statement met the requirements of the Secretary's environmental assessment requirements including the assessment of flood behaviour during construction and operation for a range of modelled flood events up to the probable maximum flood (taking into account climate change) and, as such, is considered appropriate to inform project approval.

During design development, Sydney Metro would update the flood model for the project to take into account the South Creek Sector Review and complete additional calibration and validation of the flood model to ensure the flood model is the most accurate representation for use in design development.

Sydney Metro acknowledges receipt of the draft South Creek Sector Review hydrological data; however, this data was not available during preparation of the Environmental Impact Statement. Sydney Metro has undertaken a preliminary review of the hydrological changes resultant from updates to modelling of the South Creek, which indicates that the upstream tributaries of South Creek have received a detailed review since the South Creek Flood Study update in 2015 (Penrith City Council, 2015) and the catchments have greater resolution in terms of catchment size and detail. This preliminary review of the draft documents indicates that changes in the catchment response as a result of the modelling updates are anticipated to be minor in the vicinity of the project, and not a trigger for substantial changes to the design as presented within the Environmental Impact Statement.

Mitigation measure OHYD1 requires the flood model for the project to be updated having regard to the flood modelling undertaken for the South Creek Sector Review by Infrastructure NSW. The flood model used for the flood impact assessment during design development would be updated to account for recent South Creek Sector Review modelling updates. Re-calibration and validation of the project flood model for use in flood assessment during design development would also be completed. Mitigation measure OHYD1 has been revised to confirm that the flood model will be updated to address potential residual flood impacts and that the model would be prepared in consultation with key stakeholders.

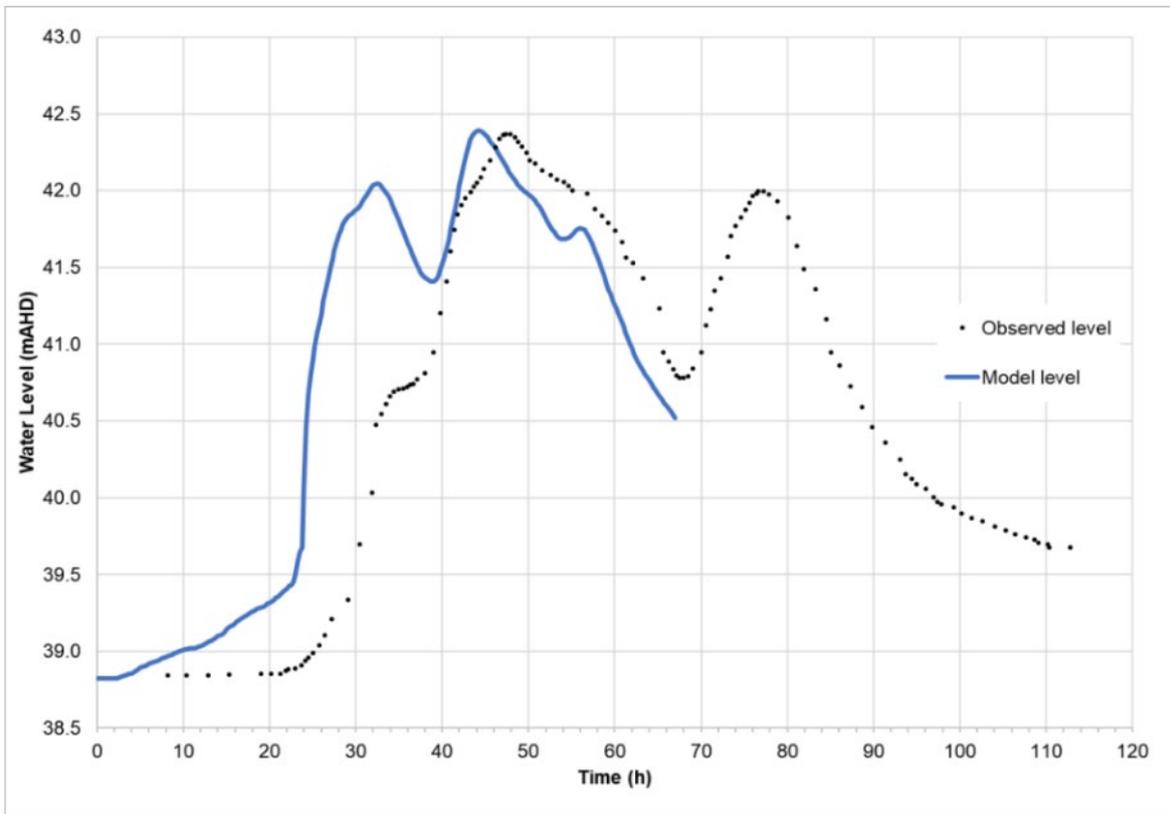


Figure 5-1 Stage hydrograph comparison – Elizabeth Drive gauge – June 1991 flood event

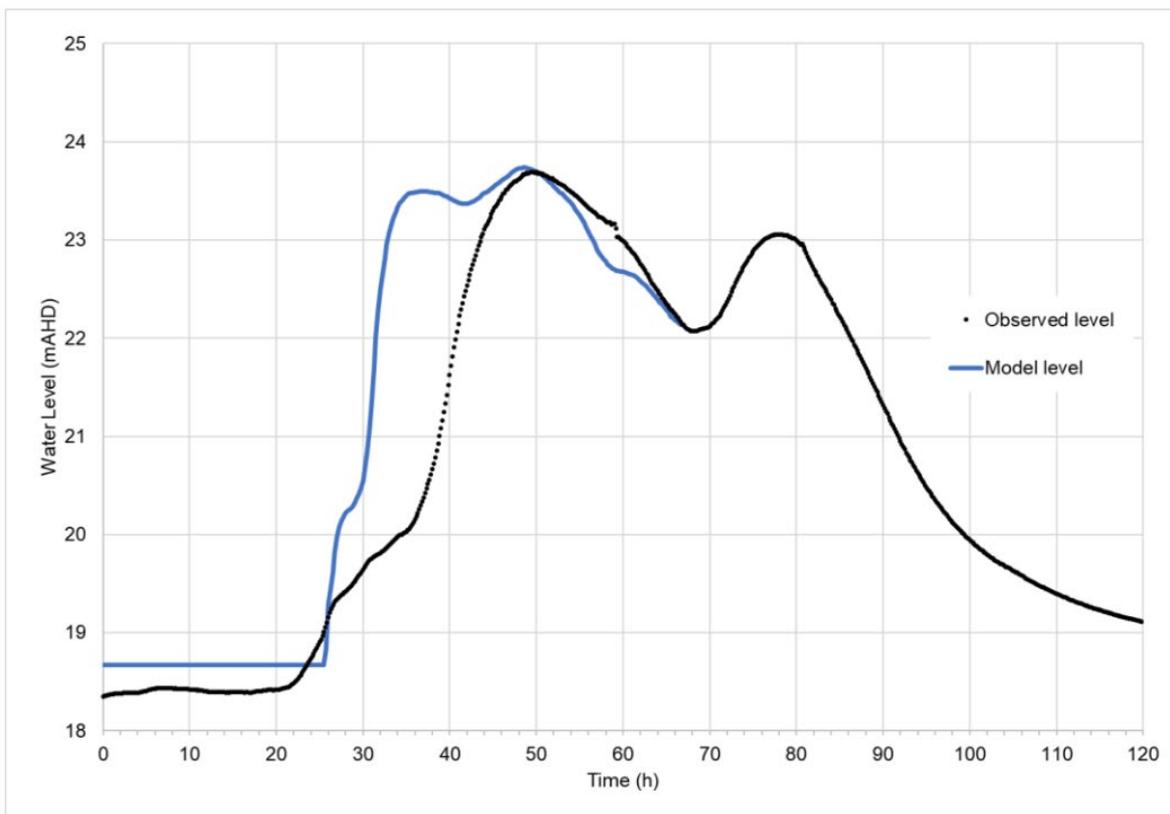


Figure 5-2 Stage hydrograph comparison – Great Western Highway gauge – June 1991 flood event

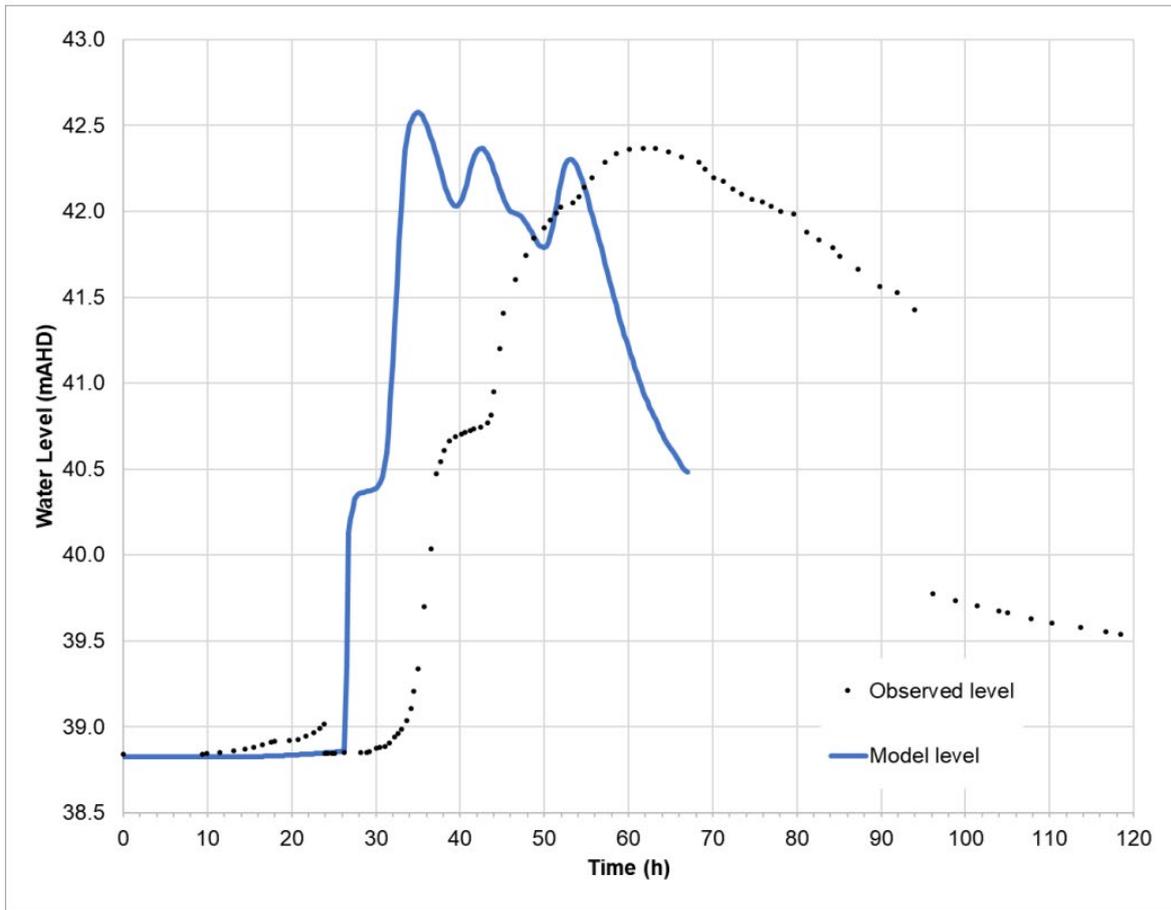


Figure 5-3 Stage hydrograph comparison – Elizabeth Drive gauge – August 1992 flood event

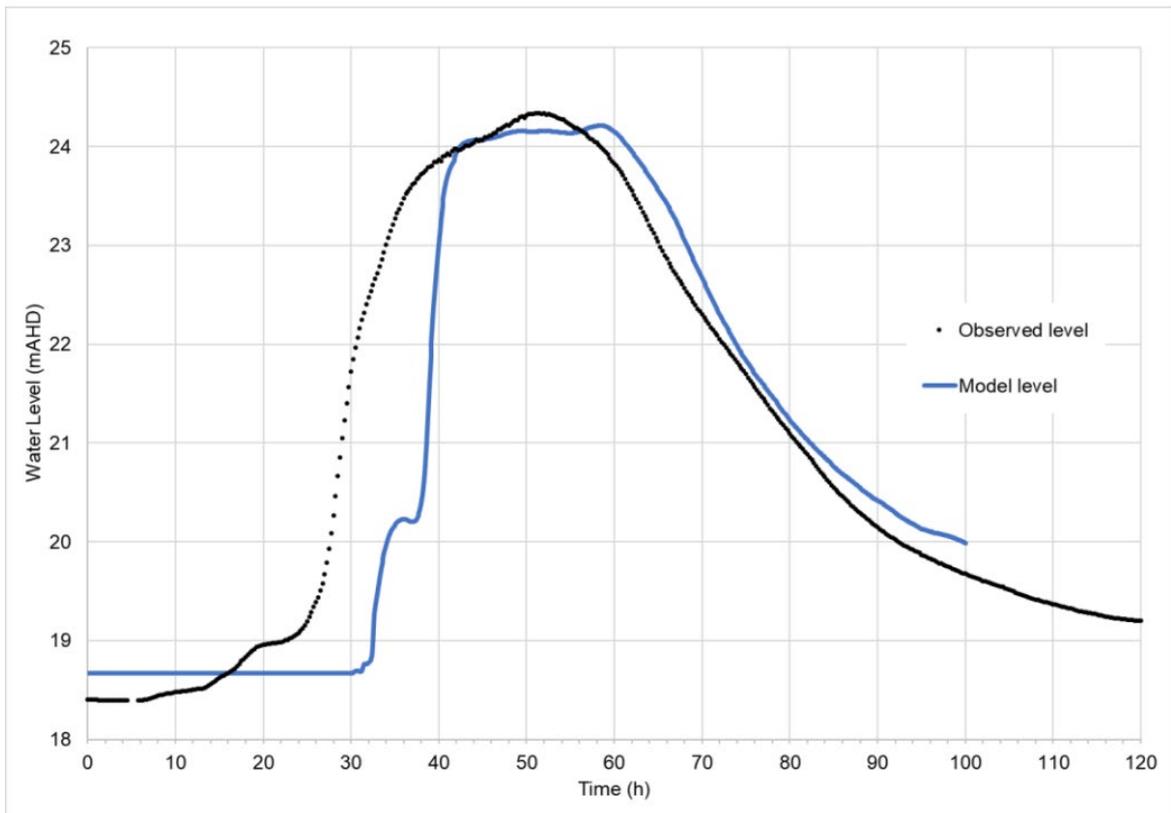


Figure 5-4 Stage hydrograph comparison – Great Western Highway gauge – August 1992 flood event

Climate change design

Issues raised

EES recommended the project be designed to include impacts due to climate change, and the 0.5 metre freeboard not be eroded to account for climate change impacts.

Response

The flood modelling for the project has been undertaken to account for climate change impacts. The track levels have been designed to accommodate the flood immunity 1 per cent annual exceedance probability (AEP) inclusive of climate change. The project generally meets flood impact criteria for the 1 per cent AEP event inclusive of climate change, except at the Blaxland Creek floodplain.

As per the operational performance outcomes for flooding outlined in Table 7-1, the project would be designed to ensure critical infrastructure (including stations entries and tunnel portals) would have immunity against the probable maximum flood event.

Mitigation measure OHYD1 has been updated to ensure the flood model for the project is updated with regard to flood modelling undertaken for the South Creek Sector Review (anticipated to be released in 2021) and would include updated calibration and validation. The updated flood modelling would be used to inform design development including addressing potential residual flood impacts identified at the following locations:

- the viaduct and earthworks in the vicinity of Blaxland Creek so as to minimise the extent of the project within the floodplain
- the earthworks arrangement at the stabling and maintenance facility in the area affected by the probable maximum flood.

Request for further flood modelling

Issues raised

EES recommended detailed overland flood modelling be undertaken at St Marys and Aerotropolis Core where potential local overland flows impacts are identified, in consultation with councils, to determine the extent of the flood risk and recommend measures to mitigate the risk to life and property.

EES requested the flood study report, models, GIS datasets and other relevant information be uploaded into the NSW Flood Data Portal.

Response

Updates to the flood model for the project would be updated in consultation with relevant stakeholders. Sydney Metro is committed to continuing consultation with relevant stakeholders throughout the design development process, including EES.

Mitigation measure OHYD1 has been revised to confirm that the flood model will be updated to address potential residual flood impacts and that the model would be prepared in consultation with key stakeholders.

Flood information including flood reports, models and geographic information system outputs would be provided to the relevant local councils.

Mitigation measure OHYD2 requires development of localised stormwater management plans at St Marys Station and Aerotropolis Core Station to ensure they are protected from localised flooding.

Design of viaduct/bridge crossings

Issues raised

EES raised concern regarding the potential for minor increases of floodwater levels upstream of the waterways where viaduct crossings are required due to flow resistance at viaduct piers.

Response

As per the operational performance outcomes for flooding outlined in Table 7-1, existing flow regimes and velocities for moderate and high fragility watercourses impacted by the project would be maintained as far as possible to preserve and minimise changes to the watercourses. Mitigation measure OWQ4 also requires the detailed design of viaducts across waterways to minimise

infrastructure within the bed and banks of existing waterways and minimise changes to flood behaviour across the floodplain.

As part of the updated flood modelling required by revised mitigation measure OHYD1, this information would be used to inform design development including addressing potential residual flood impacts identified at the viaduct and earthworks arrangement in the vicinity of Blaxland Creek so as to minimise works within the floodplain.

Culvert crossings

Issues raised

EES requested clarification as to whether any other waterways are proposed to have culvert crossings in addition to the unnamed tributary of Blaxland Creek between Lansdowne Road and Blaxland Creek and where these culverts would be located.

Response

No additional culvert crossings are currently proposed. This would be confirmed during design development.

Mitigation, management and monitoring

Issues raised

EES recommended consultation with Penrith and Liverpool councils and the NSW State Emergency Service Zone Commander on the preparation of a Flood Emergency Management Plan that considers the impacts on managing risk to life, emergency management arrangements, evacuation, access and contingency measures for the development considering the full range of flood risk.

Response

Section 14.6 of the Environmental Impact Statement describes the potential flooding impacts of the project during operation. This assessment shows that the project would have minimal potential impacts on flood behaviour. The project would therefore not require changes to existing community emergency management arrangements for flooding.

Sydney Metro does not propose to prepare a Flood Emergency Management Plan. However, mitigation measure HYD1 requires construction planning to consider flood related mitigation including consultation with NSW State Emergency Services and relevant local councils regarding management of flood events.

5.5.3 Groundwater and geology

Groundwater discharge

Issues raised

EES requested clarification as to whether the treated groundwater would be of similar quality to the receiving surface watercourses that it is being discharged to, and whether it is likely to impact the downstream aquatic environment.

EES requested clarification as to whether groundwater will need to continue to be discharged to the local watercourses during operation, and if so, whether there could be any long-term impacts on the watercourses including modification of the flow regime and impacts on the downstream aquatic environment.

Response

Section 14.4.1 of the Environmental Impact Statement determined that historic catchment condition and water quality studies identify South Creek as one of the most degraded catchments in the wider Hawkesbury-Nepean catchment (Hawkesbury-Nepean Catchment Management Authority, 2007). Technical Paper 6 – Flooding, hydrology and water quality found that the existing water quality in the area is generally not meeting the recommended ANZECC values. The existing water quality is considered poor and degraded due to high nutrient concentrations and low dissolved oxygen concentrations.

Potential surface water quality impacts during operation, including water treatment plants, are detailed in Table 14-6 of the Environmental Impact Statement. During operation groundwater would be

captured and treated at wastewater treatment plants located at St Marys Station and Bringelly services facility.

The project would be designed to achieve the water quality performance outcomes listed in Table 7-1 to ensure that all water discharged from the project would:

- contribute towards achieving ANZECC guideline water quality trigger values for physical and chemical stressors for slightly disturbed ecosystems in lowland rivers in southeast NSW, or
- meet any water quality criteria determined in consultation with the EPA (off-airport) where an Environment Protection Licence is required or in consultation with Western Sydney Airport in accordance with the Airports Regulations.

Mitigation measure WQ1 requires a surface water quality monitoring program to be implemented to monitor water quality during construction. The program would monitor all construction discharge locations and take into account monitoring being undertaken as part of other infrastructure projects such as the M12 Motorway and Western Sydney International.

Treated groundwater would be tested before discharge to comply with any relevant Environment Protection Licence or agreed discharge criteria, as required by OGW1.

As outlined in the new mitigation measure WQ2 and revised mitigation measure OWQ7, Sydney Metro is committed to water treatment plants being designed so that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default guidelines for 95 per cent species protection and 99 per cent species protection level for toxicants that bioaccumulate, unless other discharge criteria are agreed with relevant authorities. Consistent with the requirements of the Construction Environmental Management Framework (Appendix E), detailed procedures for the treatment, testing and discharge of groundwater from the site would be included in a Groundwater Management Plan (or equivalent).

5.5.4 Beyond the scope of the Environmental Impact Statement

Future metro extensions

Issues raised

EES raised concern regarding potential future extensions north of the project and associated impacts on Shanes Park and Ropes Creek.

Response

Sydney Metro notes the concerns raised about potential impacts of any future extensions on Shanes Park and Ropes Creek. Potential impacts of possible future extensions north of the project are beyond the scope of the project and would be subject to further assessment, design development and approval.

5.6 Department of Planning, Industry and Environment (Water)

5.6.1 Flooding, hydrology and water quality

Assessment methodology

Issues raised

The Department of Planning, Industry and Environment (Water) recommended the stream ordering for watercourses as outlined in the Environmental Impact Statement be corrected to be in accordance with the Natural Resources Access Regulator (NRAR) Guidelines for controlled activities on waterfront land, and that viaduct/bridge crossings of watercourses be designed in accordance with these guidelines.

Response

The Secretary's environmental assessment requirements reference the NSW Office of Water's Guidelines for controlled activities on waterfront land which in turn references the Strahler System for stream ordering. Sydney Metro is not proposing to change the stream orders identified in the Environmental Impact Statement, as these were based on NSW Office of Water (2012) River Styles Spatial Layer for New South Wales which includes the Strahler stream order data for each watercourse. Additionally, any changes to stream order would not impact the findings of the

geomorphology assessment, nor impact the proposed mitigation measures and performance outcomes, as these are based on the fragility of the watercourse and not the stream order.

A new mitigation measure (WQ3) has been included which requires the design and construction of the project to take into account the former NSW Office of Water's Guidelines for controlled activities on waterfront land. This would enable the mitigation of potential impacts on water quality.

Water Access Licence

Issues raised

The Department of Planning, Industry and Environment (Water) sought confirmation of whether the project is exempt from requiring a Water Access Licence during the operational phase of the project.

Response

A critical State significant infrastructure project is not exempt from the requirements to obtain a Water Access Licence, if it is required under the *Water Management Act 2000*. As such, if required the project would obtain a Water Access Licence during the operational phase.

Mitigation, management and monitoring

Issues raised

The Department of Planning, Industry and Environment (Water) raised the following comments:

- the conceptual hydrogeological model is reasonable and potential surface water impacts and mitigation are appropriately identified
- additional studies and monitoring are recommended if the project is approved
- an Erosion and Sediment Control Plan should be developed in consultation with the Department of Planning, Industry and Environment (Water).

Response

Mitigation measure GW5 requires development of a detailed hydrogeological and geotechnical model for the project which would be progressively updated during design and construction. The model would be informed by the results of the groundwater monitoring program.

The Construction Environmental Management Framework (Appendix E) requires the development and implementation of Erosion and Sediment Control Plans in accordance with *Managing Urban Stormwater: Soils & Construction Volume 1 and 2* (Landcom, 2004) to minimise potential flooding impacts and the impacts of flooding at construction sites (refer to clause 12.2). The Construction Environmental Management Plan would be prepared in accordance with the Construction Environmental Management Framework, conditions of approval for the project (if the project is approved) and the commitments made within the Environmental Impact Statement and this report.

5.7 Department of Primary Industries (DPI Fisheries)

5.7.1 Biodiversity

Mitigation, management and monitoring

Issues raised

DPI Fisheries recommended project approval be subject to the following conditions:

- all final designs and construction of waterway crossings allow for suitable fish passage
- any stream realignment be constructed to ensure habitat values are included.

Response

The project has been designed to minimise impacts on Key Fish Habitat through use of modular bridges and/or culvert for the maintenance road crossings, and viaducts over creek lines and Key Fish Habitat (South Creek, Cosgroves Creek and Blaxland Creek), and the tunnel beneath Badgerys Creek and the associated on-airport ECZ. The mobilisation of sediments would be contained within the construction footprint and managed in accordance with mitigation measure OWQ3.

Mitigation measure FF7 requires fish passage and habitat associated with Cosgrove Creek and Blaxland Creek to be protected in accordance with the *Policy and Guidelines for Fish Habitat*

Conservation and Management (DPI Fisheries NSW, 2013). Mitigation measure OFF1 requires wildlife connectivity to be maintained (where possible) through the installation of viaduct/bridge structures designed in accordance with the *Policy and Guidelines for Fish Friendly Waterway Crossings* (DPI Fisheries, 2013).

As outlined in mitigation measure OFF1, wildlife connectivity would be maintained (where possible) through the installation of viaduct/bridge structures designed to avoid relocation or adjustment of the stream bed where possible.

A new mitigation measure (OFF2) notes that the design of viaduct structures over the wildlife/riparian corridors at Blaxland Creek, the unnamed tributary of South Creek to the south of Patons Lane and Cosgroves Creek would seek to:

- maximise the span over the wildlife/riparian corridor
- minimise native vegetation removal within the wildlife/riparian corridors
- maintain opportunities for fauna movement along the wildlife/riparian corridors and
- provide opportunities to enhance fauna movement where possible.

Conditions of approval are a matter for the Department of Planning, Industry and Environment to consider during its assessment of the project.

5.7.2 Flooding, hydrology and water quality

Mitigation, management and monitoring

Issues raised

DPI Fisheries recommended project approval be subject to a condition requiring the installation and maintenance of best practice sediment and erosion controls.

Response

The Construction Environmental Management Framework (Appendix E) requires the development and implementation of Erosion and Sediment Control Plans in accordance with *Managing Urban Stormwater: Soils & Construction Volume 1 and 2* to minimise potential flooding impacts and the impacts of flooding at construction sites (refer to clause 12.2). The Construction Environmental Management Plan would be prepared in accordance with the Construction Environmental Management Framework, conditions of approval for the project (if the project is approved) and the commitments made within the Environmental Impact Statement and this report.

As per the construction performance outcomes for water quality outlined in Table 7-1, the project would be designed to ensure that no aspect of construction would materially adversely affect existing water quality in receiving waters to a minimum 0.5 exceedances per year (EY) storm event, or in line with *Managing Urban Stormwater: Soils & Construction Volume 1 and 2*.

Conditions of approval are a matter for the Department of Planning, Industry and Environment to consider during its assessment of the project.

5.8 Environment Protection Authority

5.8.1 Noise and vibration

Assessment methodology

Issues raised

EPA raised the following comments:

- the proposed sleep disturbance assessment criteria presented in Technical Paper 2 – Noise and vibration differ from the criteria presented in Appendix H (Construction Noise and Vibration Standard) of the Environmental Impact Statement. EPA requests confirmation of the sleep disturbance assessment criteria to be adopted
- the method to derive project amenity noise levels should be revised to be in accordance with the *Noise Policy for Industry* and the project intrusive noise levels, and the project amenity noise levels should be expressed using a $L_{Aeq,15min}$ descriptor

- the predicted noise levels do not consider the effect of mitigation, so the likely extent of impact from the construction of the project cannot be readily determined
- the on-airport and off-airport noise objectives should be harmonised in accordance with the more conservative off-airport noise objectives.

Response

The *Noise Policy for Industry* has been adopted for sleep disturbance assessment criteria. The Construction Noise and Vibration Standard (Appendix F) has been updated to reflect the more current guidance from the *Noise Policy for Industry* and would be used for the project.

The discussion of the method to derive project amenity noise levels and the $L_{Aeq,15min}$ descriptor was correctly described in the main body of Technical Paper 2 – Noise and vibration and in accordance with the *Noise Policy for Industry*, however was presented incorrectly in Appendix F of the same report.

The results of the construction noise assessment provided in Section 10.5 of the Environmental Impact Statement are pre-mitigation. Exceedances of NMLs are likely to be reduced once mitigation measures are applied in accordance with the Construction Noise and Vibration Standard. As outlined in Section 10.5.1 of the Environmental Impact Statement, project specific mitigation would include consideration of acoustic sheds with suitable noise attenuation, which may reduce the number of exceedances of NMLs during construction by around 30 per cent to 50 per cent.

In addition, standard mitigation measures are identified in the Construction Noise and Vibration Standard which would be applied at all construction sites.

Site-specific Noise and Vibration Impact Statements would be prepared for:

- all works outside standard construction hours likely to exceed the relevant NMLs
- activities likely to result in highly noise affected receivers
- activities likely to generate vibration levels at receivers in excess of the relevant criteria.

The Noise and Vibration Impact Statements would clearly indicate which mitigation measures have been/are to be incorporated into the calculations for the noise assessment. This allows consideration of residual impacts.

The purpose of Noise and Vibration Impact Statements is to provide more detailed predictions of noise and vibration impacts when compared to the potential construction scenarios considered in the Environmental Impact Statement. To achieve this, they would be undertaken prior to construction by contactors who are in control of the activity or location. The Construction Noise and Vibration Impact Statements ensure that accurate impacts are defined, NMLs are achieved wherever possible, works scheduling is considered and sensitive receivers are aware of the approach to minimising impacts upon them.

For sites where works are predicted to exceed noise goals and impact on receivers for an extended period of time, additional feasible and reasonable noise mitigation measures such as those outlined in Section 4 of the Construction Noise and Vibration Standard, would be considered to reduce the noise levels and impact on sensitive receivers.

The Airports Regulations provide specific criteria to be met at sensitive receivers from construction noise and operational rail traffic noise generated on airport land. The Airports Regulations provide higher allowances for noise generating activities which generally relate to noise generated by aircraft.

The noise and vibration impact assessment undertook an assessment of construction noise against both the Airports Regulations and the *Interim Construction Noise Guideline* noting that the *Interim Construction Noise Guideline* is more stringent. The assessment has been undertaken in accordance with the relevant regulatory frameworks that apply off-airport and on-airport. If the project is approved, Sydney Metro would undertake the construction and operation of the project in accordance with the applicable regulatory framework.

Request for additional information

Issues raised

EPA recommended the following additional information be provided:

- identification of repetitive daily trends in the ambient noise monitoring results that cannot be explained by normal diurnal patterns so that the likely cause can be removed to ensure the NMLs are based on representative long-term trends
- additional information to demonstrate the ambient noise monitoring results are indicative of ambient and background noise levels across the greater catchment
- potentially affected receivers should be identified by specific addresses or localities to help the community identify potential impacts at their premises
- plain English information to further explain potential noise and vibration impacts and how these impacts would be managed
- further information on the anticipated duration of impacts associated with the construction scenarios.

Response

The noise monitoring results are considered to be representative of the long-term background noise environment across the greater catchment area. Appendix A of Technical Paper 2 – Noise and vibration of the Environmental Impact Statement shows how the ambient noise monitoring data has been analysed and the graphs show the monitoring data that has been excluded. The data was initially low pass filtered, by removing high frequency noise that was generated by insects. The data was then screened to remove results that are adversely affected by wind and rainfall events. Finally, periods where the L90 data was increased which was not consistent with the dataset for the monitoring location on other days was also removed so as to not adversely affect the calculated rating background level for that location. All other data was retained.

The unattended noise monitoring that was undertaken was supplemented with attended noise measurements, with consistency observed between the two datasets. The noise monitoring results have been compared to results at similar locations for other projects in the vicinity (such as St Marys Intermodal, M12 Motorway project and Western Sydney International). This comparison also showed consistency between the results for all projects. If required, additional noise monitoring would also be undertaken by the Principal Contractor(s) during construction planning and design development, to further validate the noise monitoring results across the greater catchment area.

The figures provided in Appendix A of Technical Paper 2 – Noise and vibration of the Environmental Impact Statement present individual properties throughout each construction scenario (typical and worst case and for standard hours and night-time) in a clear manner. In addition, for the purpose of the Environmental Impact Statement exhibition the interactive portal for the project provides an interactive map (with the ability to search by address) and information for community members to identify their property and understand how they could be potentially affected by the project, including from construction noise.

Chapter 10 (Noise and vibration) of the Environmental Impact Statement provided a clear plain English summary of the technical assessment presented in Technical Paper 2 – Noise and vibration including figures and graphs to demonstrate the impacts as a result of the project within each noise catchment area. This was supported by the information contained on the interactive portal for the project, including an interactive map.

In response to the EPA's recommendation that further information should be provided on the anticipated duration of impacts associated with the construction scenarios, Table 5-1 has been prepared. This table identifies the anticipated duration of the key noise generating activities within the construction scenarios that have been predicted to result in highly noise affected receivers within the NCA. The key noise generating activities that have been identified would largely occur on an intermittent basis rather than continuously throughout the durations presented below.

The table does not present all noise generating activities or the overall duration of construction scenarios. Indicative construction programs for each construction activity at each construction site are provided in Chapter 8 (Project description – construction) of the Environmental Impact Statement.

More detailed information on predicted noise impacts within each NCA is provided in Chapter 10 (Noise and vibration) of the Environmental Impact Statement.

It should also be noted that the table only includes information on construction activities proposed within the off-airport areas of the project.

Table 5-1 Key noise generating activities and durations – highly noise affected receivers

Scenario	Noise Catchment Area	Key noise generating activity	Duration (weeks)	Comments
Earthworks and excavation	NCA03 (St Marys, north of T1 Western Line and west of Forrester Road) 30 highly noise affected receivers during typical construction works	Excavation of station box at St Marys	32	Noise levels mainly influenced by the intermittent use of hydraulic hammers during station box excavation at St Marys for around eight months of the construction period. As the excavation works for St Marys station box progress further underground, the noise impacts to surrounding sensitive receivers would reduce. Additionally, in accordance with the Construction Noise and Vibration Standard, project specific mitigation measures would be implemented, including the consideration of acoustic sheds with suitable noise attenuation which would reduce potential noise exceedances and duration of impacts.
	NCA06 (Claremont Meadows, between the Great Western Highway and M4 Western Motorway, west of South Creek) 2 highly noise affected receivers during typical construction works	Excavation of the tunnel portal at Orchard Hills and the excavation of the cutting for the proposed station Excavation of the shaft for the services facility at Claremont Meadows	32	Noise levels mainly influenced by the intermittent use of hydraulic hammers during station and portal excavation at Orchard Hills and excavation at Claremont Meadows services facility for around eight months of the construction period. As the excavation works at Claremont Meadows services facility progresses further underground, the noise impacts to surrounding sensitive receivers would reduce. In accordance with the Construction Noise and Vibration Standard, project specific mitigation measures would be implemented, including the consideration of acoustic sheds with suitable noise attenuation which would reduce potential noise exceedances and duration of impacts.

Scenario	Noise Catchment Area	Key noise generating activity	Duration (weeks)	Comments
	NCA08 (Orchard Hills, south of the M4 Western Motorway, between Mamre Road and Calvers Road) 18 highly noise affected receivers during typical construction works	Excavation of the tunnel portal at Orchard Hills and the excavation of the cutting for the proposed station	32	Noise levels mainly influenced by the intermittent use of hydraulic hammers during station and portal excavation at Orchard Hills for around eight months of the construction period. As the excavation works for the Orchard Hills portal progresses further underground, the noise impacts to surrounding sensitive receivers would reduce. In accordance with the Construction Noise and Vibration Standard, project specific mitigation measures would be implemented, including the consideration of acoustic sheds with suitable noise attenuation which would reduce potential noise exceedances and duration of impacts.
Rail systems fitout	NCA08 (Orchard Hills, south of the M4 Western Motorway, between Mamre Road and Calvers Road) 1 highly noise affected receiver during typical construction works	Installation of track along the surface rail alignment	20	Noise levels mainly influenced by the intermittent use of concrete vibrators, dozers, and loaders during trackworks for around 5 months of the construction period. In accordance with the Construction Noise and Vibration Standard, project specific mitigation measures would be implemented which would reduce potential noise exceedances and duration of impacts.
Finishing works	NCA03 (St Marys, north of T1 Western Line and west of Forrester Road) 7 highly noise affected receivers during typical construction works	Demolition of temporary concrete roads and structures which are no longer required	24	Noise levels mainly influenced by the intermittent use of hydraulic hammers during precinct works and site demobilisation at St Marys for around 6 months of the construction period. In accordance with the Construction Noise and Vibration Standard, project specific mitigation measures would be implemented which would reduce potential noise exceedances and duration of impacts.
	NCA08 (Orchard Hills, south of the M4 Western Motorway,	Demolition of temporary concrete roads and structures	28	Noise levels mainly influenced by the intermittent use of hydraulic hammers during site

Scenario	Noise Catchment Area	Key noise generating activity	Duration (weeks)	Comments
	between Mamre Road and Calvers Road) 1 highly noise affected receiver during typical construction works	which are no longer required		demobilisation works at the Orchard Hills construction site and the off-airport construction corridor for around 7 months. In accordance with the Construction Noise and Vibration Standard, project specific mitigation measures would be implemented which would reduce potential noise exceedances and duration of impacts.

Potential noise-based land use conflicts

Issues raised

EPA recommended consideration of suitable planning controls to minimise potential noise-based land use conflicts between the project and future urban and residential development surrounding the project, particularly near stations, the stabling and maintenance facility and ancillary support buildings and notes that suitable strategies are outlined in the *Development Rear Rail Corridors and Busy Roads – Interim Guideline* (Department of Planning, 2008).

EPA requested project approval be subject to a condition requiring preparation of an Operational Noise and Vibration Review that considers how the project will achieve the operational project objectives in accordance with the relevant policy/guideline and in consultation with EPA.

EPA recommended that the project approval should be subject to a condition which requires noise exceedances identified for the stabling and maintenance facility, stations, service facilities and ancillary facilities to require careful consideration at detailed design stage with the aim of achieving the confirmed project noise trigger levels derived from the *Noise Policy for Industry*.

Response

The Corridors SEPP identifies a protected corridor for the North South Rail Line Corridor and the project is generally within this corridor from south of Orchard Hills to the Aerotropolis. The Corridors SEPP establishes planning controls to enable ongoing use of the land while protecting it from development to minimise land use and amenity conflicts with future rail infrastructure. Transport for NSW has a concurrence role under the Corridors SEPP in respect of certain development in or adjacent to the corridor.

Clause 87 of *State Environmental Planning Policy (Infrastructure) 2007* applies to development for residential accommodation and other sensitive uses that is on land in or adjacent to a rail corridor and that is likely to be adversely affected by rail noise or vibration. This clause requires that before determining a development application, the consent authority must consider any relevant guidelines and must be satisfied that appropriate measures will be taken to ensure that nominated L_{Aeq} levels are not exceeded.

A performance outcome for the project requires operational noise and vibration levels from rail operations to be managed in accordance with the *Rail Infrastructure Noise Guideline* and Airports Regulations. Operational noise levels for the stabling and maintenance facility, stations and other fixed infrastructure are managed in accordance with the *Noise Policy for Industry*.

The *Rail Infrastructure Noise Guideline* recognises that in some cases there may be land uses that are particularly sensitive to noise where more stringent triggers are appropriate and requires that when identifying land uses and noise receivers, both existing and planned development be considered.

Mitigation measure ONV1 has been revised and requires that an Operational Noise and Vibration Review would be prepared during design development to confirm the mitigation measures required to manage airborne noise impacts from the stabling and maintenance facility. The Operational Noise and Vibration Review would consider existing and potential future land use to establish project noise trigger levels. Sydney Metro would consult with EPA during preparation of the Operational Noise and Vibration Review.

Conditions of approval are a matter for the Department of Planning, Industry and Environment to consider during its assessment of the project.

Community engagement

Issues raised

EPA noted the importance of engaging with the community to consider their views and identify the most appropriate methods for managing potential ground-borne construction noise and vibration impacts.

Response

The Overarching Community Communications Strategy (Appendix C) provides a framework for communication and engagement during construction and provides measures for addressing community concerns in relation to noise and vibration impacts associated with the project.

Out of hours works

Issues raised

EPA requested:

- clarification of what activities will be undertaken outside standard construction hours and the likely noise impact of these scenarios
- clear justification of why work is necessary outside standard construction hours and how that justification will be tested and applied in project planning and delivery
- project approval be subject to a condition that requires demonstration of why works are required outside standard construction hours for activity-based approval.

Response

The proposed hours of work aim to provide a balance between minimising the intensity of impacts to the community, the duration of impacts to the community and the efficiency of construction.

Proposed construction hours for the project, including a list of activities that may be carried out outside the standard construction hours, are presented in Chapter 8 (Project description – construction) of the Environmental Impact Statement. The activities listed in Chapter 8 along with a description of how these have been addressed in the noise and vibration assessment is provided in Table 5-2.

Further, it is noted that in accordance with the Construction Environmental Management Framework and Construction Noise and Vibration Standard, the Principal Contractor(s) appointed to undertake the construction works would be required to prepare and implement a Construction Noise and Vibration Management Plan. The Construction Noise and Vibration Management Plan would also be supplemented with Construction Noise and Vibration Impact Statements (CNVIS), which are based on more detailed information regarding the proposed construction works, equipment, locations and timing. The CNVIS are typically written with a focus on specific activities or locations and consider works that may be carried out inside and outside of standard working hours.

Table 5-2 Noise and vibration assessment of out-of-hours work activities

Activities that may be carried out outside the standard construction hours	How the activity was considered in the noise and vibration assessment
Utility works	<p>Assessed in Scenario SC01 (Enabling Works) which also includes the permanent and temporary power supplies to the project. For the purposes of the Environmental Impact Statement, these works were assumed to primarily take place during standard hours.</p> <p>Where out of hours works are required additional assessment and approval processes would be followed, in accordance with the Sydney Metro Out-of-Hours Work Protocol, with consideration of the proposed noise producing activity, duration, affected receivers and respite periods.</p>

Activities that may be carried out outside the standard construction hours	How the activity was considered in the noise and vibration assessment
	Further, it is noted that the utility works, where required, would occur over a limited duration.
Tunnelling works and other underground works	Assessed in Scenario SC02 (Tunnelling and associated works). For the purposes of the Environmental Impact Statement, these works were assumed to take place during standard and out of hours work periods.
Works within an acoustic shed	<p>For the purposes of the Environmental Impact Statement, these works were not assessed. Specific details of the acoustic shed locations, construction, and works that would be undertaken within are subject to construction planning and design development and are unconfirmed at this stage of the project. Therefore, works were assessed based on the worst case scenario with no acoustic shed present.</p> <p>Where an acoustic shed is used a significant reduction in construction noise emissions is expected which would be beneficial for noise mitigation.</p>
Tunnel fit-out and associated works	<p>Assessed in Scenario SC07 (Rail Systems Fitout). For the purposes of the Environmental Impact Statement, the off-airport works were assumed to primarily take place during standard hours however works within tunnels was assumed to take place during standard and out of hours work periods.</p> <p>Where out of hours works are required additional assessment and approval processes would be followed, in accordance with the Sydney Metro Out-of-Hours Work Protocol, with consideration of the proposed noise producing activity, duration, affected receivers and respite periods.</p>
Spoil haulage, deliveries and TBM activities at St Marys, Orchard Hills, Western Sydney International tunnel portal, Airport Terminal and Aerotropolis Core	Assessed in Scenario SC02 (Tunnelling and associated works). For the purposes of the Environmental Impact Statement, these works were assumed to take place during standard and out of hours work periods.
Spoil haulage associated with placement of material at the permanent spoil placement area within the airport construction support site	Assessed in Scenario SC02 (Tunnelling and associated works). For the purposes of the Environmental Impact Statement, these works were assumed to take place during standard and out of hours work periods.
Activities at the tunnel and viaduct segment production and storage facility within the airport construction support site, including transport of material to support segment production and segment deliveries	Assessed in Scenario SC02 (Tunnelling and associated works) and Scenario SC03 (Bridge and viaduct construction). For the purposes of the Environmental Impact Statement, these works were assumed to take place during standard and out of hours work periods.
Testing and commissioning	<p>Assessed in Scenario SC07 (Rail systems fitout). For the purposes of the Environmental Impact Statement, the off-airport works were assumed to primarily take place during standard hours however works within tunnels was assumed to take place during standard and out of hours work periods.</p> <p>Where out of hours works are required additional assessment and approval processes would be followed, in accordance with the Sydney Metro Out-of-Hours Work Protocol, with</p>

Activities that may be carried out outside the standard construction hours	How the activity was considered in the noise and vibration assessment
	<p>consideration of the proposed noise producing activity, duration, affected receivers and respite periods.</p> <p>Assessment of the testing and commissioning of rolling stock was not included in the Environmental Impact Statement as this would be further assessed as part of the Operational Noise and Vibration Review.</p>
<p>Construction during road and rail possessions</p> <p>Work determined to comply with the relevant noise management level (NML) at the nearest sensitive receiver</p> <p>Works on major roads in accordance with a Road Occupancy Licence</p> <p>The delivery of oversized materials or materials outside approved hours as required by the NSW Police or other authorities (including Transport for NSW) for safety reasons</p> <p>Emergency situations where it is required to avoid the loss of lives and property and/or to prevent environmental harm</p> <p>Situations where agreement is reached with affected receivers.</p>	<p>For the purposes of the Environmental Impact Statement, these works were not assessed. Specific details of the works that may be undertaken is subject to construction planning and design development and are unconfirmed at this stage of the project.</p> <p>Where out of hours works are required additional assessment and approval processes would be followed, in accordance with the Sydney Metro Out-of-Hours Work Protocol, with consideration of the proposed noise producing activity, duration, affected receivers and respite periods.</p>

Chapter 10 (Noise and Vibration) of the Environmental Impact Statement and Technical Paper 6 – Noise and vibration include an assessment of construction noise impacts associated with activities that may be undertaken outside of standard construction hours. Technical Paper 6 – Noise and vibration presents noise impact assessment of the following construction scenarios where these out of hours activities could occur:

- Scenario 1: enabling works
- Scenario 2: tunnelling and associated works
- Scenario 3: bridge and viaduct construction
- Scenario 4: earthworks and excavation
- Scenario 5: station construction
- Scenario 6: construction of stabling and maintenance and other facilities
- Scenario 7: rail systems fitout
- Scenario 8: station fitout, precinct and transport integration works
- Scenario 9: finishing works.

The assessment includes predicted construction noise levels for all Noise Catchment Areas (NCAs) for 'typical' and 'worst case' noise levels during standard hours, out of hours - day, out of hours – evening and out of hours – night periods.

The assessment identified that during out-of-hours works, exceedances are predicted to occur during tunnelling and associated works, and finishing works. During tunnelling and associated works, exceedances are predicted to occur at NCA 01 through to NCA 08 (excluding NCA 02). During finishing works, exceedances are predicted to occur (typically to a lesser extent than during tunnelling and associated works) at all NCAs, excluding NCA 02, NCA 09, and NCA 10. It should be noted that the assessment also identifies that a significant number of NCAs would not experience exceedances of noise management levels during out of hours - day, out of hours – evening and out of hours – night periods under most other scenarios. Refer to tables 10-16 to 10-26 in Chapter 10 (Noise and Vibration) of the Environmental Impact Statement and Table 4-9 of Technical Paper 6 – Noise and vibration for further detail. Activities within each of these scenarios may occur outside of standard construction hours under a range of circumstances. Chapter 10 (Noise and vibration) of the Environmental Impact Statement predicted that with suitable noise attenuation the number and extent of exceedances of the noise management level (NML) could be reduced by around 30 to 50 percent. For example, as noted in the Construction Noise and Vibration Standard (Appendix F), an acoustic shed with no openings would be expected to provide attenuation in the order of 20dB. Chapter 27 (Synthesis) of the Environmental Impact Statement discusses aspects of the construction methodology that may be subject to further refinement, including the location and layout of acoustic sheds (if required).

Further review of all potential out of hours construction activities identified in Chapter 8 (Project description – construction) of the Environmental Impact Statement would be undertaken during design development and construction planning and would include consideration of the alternative construction methods, justification, duration and timeframes for out of hours work as well as additional mitigation measures that would be implemented to address any potential impacts. This information would be documented in Construction Noise and Vibration Impact Statements as required. Discussion on key activities that would need to be undertaken outside of standard construction hours is included below.

Tunnelling activities would be undertaken 24 hours a day, seven days a week as TBMs would need to continually operate once commissioned. Ancillary surface support activities such logistics support and material delivery and handling would also occur during tunnelling works, 24 hours a day, seven days a week. The lining for the tunnels would be assembled from precast concrete segments and installed progressively as the TBM moves forward. The precast concrete segments would be manufactured using concrete from a dedicated concrete batching plant which would be located at the airport construction support site (see Figure 8-4 of the Environmental Impact Statement). The manufacture of segments within the airport construction support site would be undertaken 24 hours a day, seven days a week due to the process of manufacture, which requires that the ‘forming’ of the segments, concrete pour and concrete curing activities occur in a continuous cycle, with transport of the cured segments out of the facility to storage.

Transportation of tunnel segments from the precast manufacturing plant to off-airport tunnel portal sites may also be required outside of standard hours to ensure progressive installation can be maintained during TBM operations, and in order to reduce the impact of heavy vehicle movements on the road network outside of the AM and PM peaks. Delivery of materials into the precast manufacturing plant may also be required outside of standard construction hours to directly support the manufacturing process, as well as to reduce the impact of heavy vehicle movements on the local road network during the AM and PM peaks.

Delivery of other materials to the TBM operation sites are may also be required outside of standard construction hours to directly support the continuous tunnelling activities, as well as to reduce the impact of heavy vehicle movements on the road network outside of the AM and PM peaks.

Bridge and viaduct construction activities also include concrete segment manufacture, transportation and storage. Transportation of bridge and viaduct segments would be required outside of standard construction hours due to road restrictions on the delivery of oversized segments or materials during standard construction hours. Other out of hours bridge and viaduct construction works may include activities that would take place over existing roads and must be undertaken in accordance with a Road Occupancy Licence and other safety considerations.

Haulage of spoil to and from construction sites across the project may be undertaken outside of standard construction hours to reduce the impact of heavy vehicle movements on the road network outside of the AM and PM peaks, and where this activity does not have a significant impact on residences.

Where possible, Sydney Metro would limit out of hours transport of tunnel and bridge segments, delivery of materials and haulage of spoil to the out of hours – day and out of hours – evening periods.

As described in Chapter 8 (Project description – construction) of the Environmental Impact Statement, fit-out of tunnels, rail systems and stations would occur concurrently with other activities such as structural and architectural works. Fitout works involve multi-disciplinary teams working in constrained spaces which can pose a safety risk if all teams are working at the same time. To manage this safety risk, fitout works may need to be undertaken through staggered workgroups and workshifts outside of standard construction hours. Fitout works may occur underground between the tunnel portals and at station sites. Ancillary surface support activities such as site establishment, material delivery and handling and use of cranes would also occur during tunnel, rail systems and station fitout works. Deliveries of rail to site on other Sydney Metro projects have been restricted to outside of peak traffic periods by relevant road authorities which may also be expected for this project.

The approach to out of hours work would also be in accordance with an Out-of-Hours Work Protocol to guide the assessment, management, and approval of works outside standard construction work hours. The protocol would ensure that out of hours works are managed effectively during construction, to reduce incidents and minimise impacts on the community. The protocol would be consistent with the Construction Noise and Vibration Standard (Appendix F).

With the exception of emergencies and subject to the terms of the planning approval and any Environment Protection Licence, activities would not take place outside standard construction hours without prior notification of the affected community and the EPA as required.

Conditions of approval are a matter for the Department of Planning, Industry and Environment to consider during its assessment of the project.

Mitigation, management and monitoring

Issues raised

EPA raised the following comments:

- management of ground-borne construction impacts associated with tunnelling will require consideration of both exceedance of relevant ground-borne noise and vibration levels, as well as the duration of the exceedance when determining appropriate mitigation measures
- the approach to mitigation is complex and difficult for the community to understand and navigate when looking to determine the likely extent of construction noise impact and mitigation measures to protect sensitive receivers
- project approval should be subject to an overarching condition which states that all feasible and reasonable construction noise mitigation measures shall be applied to seek to achieve the relevant construction noise and vibration objectives contained in relevant guidelines
- road traffic noise management will require careful consideration at detailed design stage with the aim of achieving the applicable criteria under the Road Noise Policy.

Response

Ground-borne noise and vibration impacts associated with tunnelling are discussed in Section 4.9 of Technical Paper 2 – Noise and vibration. The potential duration of exposure for noise sensitive receivers, where the TBM rate of progression is around 100 metres per week are also summarised in Table 4-28 of Technical Paper 2 – Noise and vibration. The assessment predicted that 10 residential receivers above the St Marys to Orchard Hills tunnel and six receivers above the WSI to Bringelly tunnel would exceed the maximum vibration level targets. The predicted exceedances are short term (3-4 nights at a particular receiver).

A range of project-specific mitigation measures were included in the Environmental Impact Statement, including the identification of which sites they apply to. In addition, standard mitigation measures are identified in the Construction Noise and Vibration Standard (Appendix F) which would be applied at all construction sites.

Site-specific Construction Noise and Vibration Impact Statements would be prepared for:

- all works outside standard construction hours likely to exceed the relevant NMLs
- activities likely to result in highly noise affected receivers

- activities likely to generate vibration levels at receivers in excess of the relevant criteria.

The Detailed Construction Noise and Vibration Impact Statements would clearly indicate which mitigation measures have been/are to be incorporated into the calculations for the noise assessment. This allows consideration of residual impacts. The purpose of Detailed Construction Noise and Vibration Impact Statements are to provide more accurate predictions of noise and vibration impacts when compared to the potential construction scenarios considered in the Environmental Impact Statement. To achieve this, they would be undertaken immediately prior to construction by construction teams who are in control of the activity or location. The Detailed Construction Noise and Vibration Impact Statements ensure that accurate impacts are defined, NMLs are achieved wherever possible, works scheduling is considered and sensitive receivers are aware of the approach to minimising impacts upon them.

The Construction Noise and Vibration Standard (Appendix F) and Construction Environmental Management Framework (Appendix E) include commitments to implement reasonable and feasible mitigation measures to achieve relevant construction noise and vibration objectives.

A performance outcome for the project as outlined in Table 7-1 requires potential construction noise and vibration impacts on local communities (including airborne noise and ground-borne noise and vibration) to be managed in accordance with the Construction Noise and Vibration Standard (Appendix F), the *Interim Construction Noise Guideline* and the Airports Regulations.

Conditions of approval are a matter for the Department of Planning, Industry and Environment to consider during its assessment of the project.

5.8.2 Flooding, hydrology and water quality

Assessment methodology

Issues raised

EPA raised the following comments:

- the water quality assessment does not provide enough information to determine how, or whether, water quality objectives will be met, as required by the Secretary's environmental assessment requirements
- contributing towards achieving ANZECC guideline values is inadequate and depending upon the proposed discharge quality, additional treatment measures may be required, such as alteration of the water treatment plant design, increased basin storage, or capture and offsite disposal.

EPA also identified a range of issues related to guideline values that were described within Technical Paper 6 – Hydrology, flooding and water quality, including:

- the accuracy of guideline values for chlorophyll-a, total phosphorus, total nitrogen and pH
- a recommendation that the appropriate ANZG (2018) guideline values for slightly to moderately disturbed ecosystems be adopted
- recognition that for off-airport sites, the project has adopted the ANZG (2018) default trigger values for 95 per cent species protection in slightly to moderately disturbed ecosystems, but noted that the equivalent protection level for toxicants that bioaccumulate is 99 per cent
- the Environmental Impact Statement incorrectly states that for on-airport waterways, the Airports Regulations water quality limits are more stringent than the ANZECC(2000)/ANZG (2018) guidelines; however, the EPA notes several Airports Regulations limits (arsenic, chromium, copper and nickel) exceed the ANZG (2018) trigger levels for 95 per cent species protection
- a recommendation that the appropriate ANZG (2018) guideline values for slightly to moderately disturbed ecosystems be adopted
- a recommendation that where Airports Regulations water quality limits are higher than the ANZG (2018) guideline values, that the more conservative ANZG (2018) values be adopted
- a recommendation that if site-specific guideline values are developed, these should be derived consistent with Australian and New Zealand Guidelines for Fresh and Marine Water Quality, including being based on the 80th percentile of 24 months of data from an appropriate slightly disturbed reference site.

Response

The water quality assessment undertaken in the Environmental Impact Statement met the requirements of the Secretary's environmental assessment requirements as it identifies that receiving waters within the project area are not currently meeting NSW Water Quality Objectives and commits the project to contributing to achieving these objectives over time.

Section 14.4 of the Environmental Impact Statement determined that historic catchment condition and water quality studies identify South Creek as one of the most degraded catchments in the wider Hawkesbury-Nepean catchment (Hawkesbury-Nepean Catchment Management Authority, 2007). Technical Paper 6 – Flooding, hydrology and water quality found that the existing water quality in the area is generally not meeting the recommended ANZECC values. The existing water quality is considered poor and degraded due to high nutrient concentrations and low dissolved oxygen concentrations.

The project would be designed to achieve the water quality performance outcomes outlined in Table 7-1 to ensure that all water discharged from the project would:

- contribute towards achieving ANZECC guideline water quality trigger values for physical and chemical stressors for slightly disturbed ecosystems in lowland rivers in southeast NSW, or
- meet any water quality criteria determined in consultation with the NSW Environment Protection Authority (off-airport) where an Environment Protection Licence is required, or in consultation with Western Sydney Airport in accordance with the Airports Regulations (on-airport).

Water treatment plant and basin design would be confirmed during design development and detailed construction planning.

The guideline values included within Technical Paper 6 – Hydrology, flooding and water quality have been updated in Table 5-3. Values from the Environmental Impact Statement that have been updated are shown in strikethrough and bold text.

Table 5-3 Updated water quality guideline trigger values

Parameter	Trigger value or criteria
Chlorophyll-a (mg/L)	0.003 0.005
Total Phosphorous (TP) (mg/L)	0.025 0.05
Filterable Reactive Phosphorus (FRP) (mg/L)	0.02
Total Nitrogen (TN) (mg/L)	0.35 0.5
Oxides of nitrogen (NOx) (mg/L)	0.04
Ammonia (NH4) (mg/L)	0.02
Dissolved Oxygen (DO)	85% – 110%
Turbidity (NTU)	6 to 50
pH	6.5 – 8.5 6.5 – 8
Salinity (µS/cm)	125 – 2200
Oils, petroleum and hydrocarbons	Oils and petrochemicals should not be noticeable as a visible film on the water, nor should they be detectable

The protection of 95 percent of species in slightly disturbed to moderately disturbed ecosystems is appropriate for the toxicants that do not bioaccumulate. Sydney Metro notes that guidelines require 99 per cent species protection to be adopted for toxicants that do bioaccumulate (such as mercury, organochlorine pesticides, polychlorinated biphenyls and dioxins).

As outlined in the new mitigation measure WQ2 and revised mitigation measure OWQ7, Sydney Metro is committed to water treatment plants being designed so that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default

guidelines for 95 per cent species protection and 99 per cent species protection level for toxicants that bioaccumulate, unless other discharge criteria are agreed with relevant authorities. Consistent with the requirements of the Construction Environmental Management Framework (Appendix E), detailed procedures for the treatment, testing and discharge of groundwater from the site would be included in a Groundwater Management Plan (or equivalent).

The assessment has been undertaken in accordance with the relevant regulatory frameworks that apply off-airport and on-airport. If the project is approved, Sydney Metro would undertake the construction and operation of the project in accordance with the applicable regulatory framework.

Mitigation measure WQ1 requires that a surface water monitoring program would be developed in consultation with EPA and other relevant stakeholders. Mitigation measures GW5 and GW6 require the development and implementation of a groundwater monitoring program to inform development of the detailed groundwater model and preparation of a Groundwater Management Plan to manage potential construction impacts, including target criteria for discharge, trigger values and corrective actions.

Request for additional information

Issues raised

EPA recommended the following additional information be provided:

- a water quality impact assessment to determine the potential impact of the proposed discharges to waterways
- clarification on how temporary spoil stockpiles, permanent spoil placement areas and associated leachate and runoff would be managed to ensure appropriate management and mitigation measures are implemented to avoid polluting waters.

Response

Technical Paper 6 – Hydrology, flooding and water quality was prepared to address the Secretary's environmental assessment requirements and is considered appropriate to inform project approval.

Chapter 16 (Contamination) of the Environmental Impact Statement identifies potential risks of generating saline or contaminated runoff and leachate from the potential permanent spoil placement area at Western Sydney International. Any contaminated groundwater intercepted during construction would be treated in water treatment plants before discharge to ensure that works meet the requirements under Schedule 2 of the Airports Regulations.

On-site detention basins, including water quality treatment basins, would be implemented along the project construction footprint for surface construction areas. The Soil and Water Management Plan would contain management measures for contaminated material (including water) and a contingency plan to be implemented in the case of unanticipated discovery of contaminated material during construction.

The Construction Environmental Management Framework (Appendix E) describes the approach to environmental management, monitoring and reporting during construction, including a requirement to develop and implement a Spoil Management Plan that would incorporate procedures and methodologies for storage and stockpiling arrangements, including those for virgin excavated natural material, contaminated and unsuitable material. Additional contamination investigations are being progressively undertaken. The data from these additional investigations would inform detailed design and construction, with relevant information to be included in management plans and monitoring programs.

In accordance with mitigation measure SC1, the Soil and Water Construction Environmental Management Plan would incorporate:

- for low risk areas of environmental concern, worker health and safety measures, waste management and tracking for contamination would be outlined
- for medium and high risk areas of environmental concern, Detailed Site Investigations and review of further available information would be undertaken prior to the start of construction.

On-site detention basins

Issues raised

EPA raised concern that limited information is provided for the on-site detention basins and it is unclear how the statement from the Environmental Impact Statement ‘no aspect of the construction to materially adversely affect existing water quality in receiving waters to a minimum 0.5 EY storm event or in line with the Blue Book’ relates to the *Managing Urban Stormwater: Soils & Construction Volume 1 and 2* sediment basin sizing based on five day rainfall depths (as required by the Secretary’s environmental assessment requirements).

Response

Chapter 7 (Project description – operation) of the Environmental Impact Statement states that on-site detention may be needed during operation and that the final number, size of, and need for, the proposed detention and water quality basins would be confirmed during design development. In some circumstances, it may be more feasible to provide new drainage, or augment existing drainage within surrounding areas, rather than construct the basins.

During construction, consistent with the requirements of the Construction Environmental Management Framework (Appendix E), principal contractors would prepare a Soil and Water Management Plan and Progressive Erosion and Sediment Control Plans. These plans would detail the locations of sediment basins, their design rainfall event, and testing, treatment and discharge requirements. The Soil and Water Management Plan would contain management measures for contaminated material (including water) and a contingency plan to be implemented in the case of unanticipated discovery of contaminated material, during construction.

Mitigation measure OWQ2 requires that operational drainage and water treatment design is to be undertaken in accordance with Water Sensitive Urban Design requirements specified in local council, Transport for NSW and on-airport standards. This is discussed in Section 6.1.2 of Technical Paper 6 – Hydrology, flooding and water quality.

Water treatment plants

Issues raised

EPA raised the following concerns:

- lack of clarity about whether proposed water treatment plants are capable of treating the saline and/or potentially contaminated water encountered during construction and operation
- no clear commitment is made to considering discharges to receiving waters with a ‘slightly to moderately disturbed’ level of protection and it is unclear if any chemical additives would be discharged from the water treatment plants.

EPA recommended discharge criteria be characterised prior to approval to ensure that all water treatment technology can be designed and sized appropriately.

Response

The indicative location of water treatment plants and discharge points is shown in Figure 14-1 of Chapter 14 (Hydrology, flooding and water quality) of the Environmental Impact Statement. The details of the water treatment plants would be informed and determined as part of detailed construction planning, detailed groundwater modelling and the results of groundwater monitoring undertaken prior to and during construction, as required by mitigation measure GW5.

The project would be designed to achieve the water quality performance outcomes outlined in Table 7-1 to ensure that all water discharged from the project would:

- contribute towards achieving ANZECC guideline water quality trigger values for physical and chemical stressors for slightly disturbed ecosystems in lowland rivers in southeast NSW, or
- meet any water quality criteria determined in consultation with the EPA (off-airport) where an Environment Protection Licence is required or in consultation with Western Sydney Airport in accordance with the Airports (Environmental Protection) Regulations 1997 (on-airport).

Revised mitigation measure OWQ7 requires water treatment plants to be designed to ensure that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default guidelines for 95 per cent species protection and 99 per cent species

protection level for toxicants that bioaccumulate unless other discharge criteria are agreed with relevant authorities.

Mitigation measure OGW1 requires ongoing groundwater inflows from drained project elements (or incidental flows) to be treated and tested before discharge to comply with any relevant Environment Protection Licence or agreed discharge criteria during the operational phase of the project.

Mitigation, management and monitoring

Issues raised

EPA raised the following comments:

- it has not been demonstrated that the proposed management and treatment measures are appropriate for the level of contamination that may be encountered, with a focus on standard erosions and sediment controls based on *Managing Urban Stormwater: Soils & Construction Volume 1 and 2*
- not enough information is provided to determine how or whether water quality objectives would be met, as required by the Secretary's environmental assessment requirements
- contributing towards achieving ANZECC guideline values is inadequate and depending upon the proposed discharge quality, additional treatment measures may be required
- it is unclear whether the sediment basins would receive contaminated runoff and, if so, whether runoff would be directed to an on-site detention basin or a wastewater treatment plant
- project approval should be subject to a condition of approval requiring development of a Surface and Groundwater Monitoring Program in consultation with NSW EPA, which should include a Trigger Action Response Plan.

Response

The Environmental Impact Statement proposes a range of measures to manage potential water pollution impacts and is not limited to standard erosion and sediment control based on the *Managing Urban Stormwater: Soils and Construction Volume 1 and 2*.

Mitigation measure SC7 commits to managing any acid sulfate soils that may be encountered in accordance with the *Acid Sulfate Soil Manual* (Acid Sulfate Soil Management Advisory Committee, 1998). This manual provides guidance on management and mitigation of potential water quality impacts from acid sulfate soils. Mitigation measure SC8 sets out that prior to ground disturbance in high probability salinity areas, testing would be carried out and, if salinity is encountered, excavated soils would be managed in accordance with *Book 4 Dryland Salinity: Productive Use of Saline Land and Soil* (NSW DECC 2008). Mitigation measure SC9 requires targeted groundwater investigations to be undertaken prior to construction to identify high salinity areas at risk from rising groundwater.

The assessment recommends a tiered, risk-based approach for managing potential contamination including the Soil and Water Management Plan, unexpected finds protocol, detailed investigations for areas of higher risk, and remediation where required. For sites where potential contamination risk has been identified as medium or high, a further review of data has been proposed in accordance with mitigation measure SC1. Where a high risk of contamination remains following the outcomes of mitigation measures SC1, subsequent intrusive Detailed Site Investigations and remediation would be undertaken where required, in accordance with mitigation measures SC2 and SC3 respectively.

Detention basins and water treatment plant locations shown within the Environmental Impact Statement are indicative and subject to design development as well as detailed construction planning, which would determine the treatment required at each location in order to comply with any specific water quality discharge parameters.

The indicative location of water treatment plants is shown for most construction sites in Chapter 8 (Project description – construction) of the Environmental Impact Statement, while indicative treatment capacity, general discharge location and receiving watercourses is provided Chapter 14 (Flooding, hydrology and water quality) of the Environmental Impact Statement. The details of water collection and treatment (such as collection of inflows until sufficient volumes have been reached and then treating and discharging in bulk, or continuously treating and discharging collected water) and specific discharge locations would be determined as part of detailed construction planning.

The indicative location of water treatment plants and discharge points is also shown in Figure 14-1 of the Environmental Impact Statement. The design of the water treatment plants would be informed by detailed construction planning and detailed groundwater modelling; this modelling would be informed by the results of groundwater monitoring undertaken prior to and during construction as required by mitigation measure GW5.

The project would be designed to meet the following performance outcomes listed in Table 7-1 for flooding and hydrology to ensure that water discharged from the project, including runoff from hardstand areas, surface and ground water storages would:

- contribute towards achieving ANZECC guideline water quality trigger values for physical and chemical stressors for slightly disturbed ecosystems in lowland rivers in southeast NSW, or
- meet any water quality criteria determined in consultation with the NSW Environment Protection Authority (off-airport) where an Environment Protection Licence is required or in consultation with Western Sydney Airport in accordance with the Airports (Environmental Protection) Regulations 1997 (on-airport).

Revised mitigation measure WQ2 and OWQ7 require that during construction and operation water treatment plants would be designed to ensure that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default guidelines for 95 per cent species protection and 99 per cent species protection level for toxicants that bioaccumulate unless other discharge criteria are agreed with relevant authorities.

Mitigation measure OGW1 commits to ongoing groundwater inflows from drained project elements (or incidental flows) being treated and tested before discharge to comply with any relevant Environment Protection Licence or agreed discharge criteria during the operational phase of the project.

Mitigation measure WQ1 requires that a surface water monitoring program would be developed in consultation with EPA and other relevant stakeholders. Mitigation measures GW5 and GW6 require the development and implementation of a groundwater monitoring program to inform development of the detailed groundwater model and preparation of a Groundwater Management Plan to manage potential construction impacts, including target criteria for discharge, trigger values and corrective actions. Sydney Metro notes that requirements for a Trigger Action Response Plan are a standard part of the Environment Protection Licence application process, which would occur subsequent to project planning approval if the project is approved.

Conditions of approval are a matter for the Department of Planning, Industry and Environment to consider during its assessment of the project.

5.8.3 Groundwater

Mitigation, management and monitoring

Issues raised

EPA recommended:

- updated baseline groundwater monitoring results are provided to EPA for assessment to inform further assessment
- the Water Management Plan and Groundwater Monitoring Program is provided to EPA for assessment prior to commencement of construction.

Response

The groundwater monitoring network for the project is being expanded and additional monitoring is being undertaken. This additional monitoring data would be used to inform the development of the hydrogeological and geotechnical model for the project (mitigation measure GW5) and preparation of the Groundwater Management Plan (mitigation measure GW6) during the design development phase.

Sydney Metro would continue to consult with key stakeholders during the design development and construction planning, including EPA.

5.8.4 Soils and contamination

Assessment methodology

Issues raised

EPA raised concern that the Secretary's environmental assessment requirement to verify the risk of land contamination and identify if remediation is required has only been partly addressed and recommends further investigations to determine whether remediation is required.

EPA recommended the potential areas identified that could present potential risk to human health and/or the environment are addressed to ensure the site is made suitable for the proposed use.

Response

The contamination assessment undertaken in the Environmental Impact Statement met the requirements of the Secretary's environmental assessment requirements and is considered appropriate to identify potential contamination risk.

The assessment of contamination included a desktop review to understand the local environment, identify sensitive receptors and identify potential areas of existing contamination within the construction footprint. In addition site inspections were undertaken to identify any additional potential contamination sources and verify those potential areas of environmental concern identified in the review. The assessment considered available information relevant to historical land uses, contamination site inspections, the results of geotechnical and contamination investigations undertaken by Sydney Metro, and adopted a risk-based approach to the likelihood of contamination being present.

The assessment recommends a tiered, risk-based approach for managing potential contamination including the Soil and Water Management Plan, unexpected finds protocol, detailed investigations for areas of higher risk, and remediation where required. For sites where potential contamination risk has been identified as medium or high, a further review of data has been proposed in accordance with mitigation measure SC1. Where a high risk of contamination remains following the outcomes of mitigation measures SC1, subsequent intrusive Detailed Site Investigations and remediation would be undertaken where required, in accordance with mitigation measures SC2 and SC3, respectively.

Mitigation, management and monitoring

Issues raised

EPA recommended a NSW EPA-accredited Site Auditor is engaged throughout the duration of the works to provide independent oversight, including detailed contaminated land investigations, risk assessments and mitigation measures undertaken during construction. Interim audit advice from the Site Auditor should be provided, commenting on the nature and extent of the contamination for each area of environmental concern.

EPA recommended a Soil and Water Management Plan be prepared, or reviewed and approved, by an appropriately qualified professional and certified appropriate by a NSW EPA-accredited Site Auditor. An unexpected finds procedure should be developed.

EPA recommended the potential areas identified that could present potential risk to human health and/or the environment from in Technical Paper 8 – Contamination must all be addressed to ensure the site is made suitable for the proposed uses.

EPA recommended conditions of approval in relation to preparation of Section A1, Section A2 and Section B Site Audit Statements and Detailed Site Investigation Reports.

Response

Sydney Metro considers that management of minor contamination issues in low risk areas via the Soil and Water Management Plan and unexpected finds procedure is appropriate, consistent with construction practices across NSW for projects of this nature, and that engaging a Site Auditor throughout the duration of the works is not required.

In accordance with mitigation measure SC3, a NSW EPA-accredited Site Auditor would be engaged when a Remediation Action Plan is required. A Remediation Action Plan would be prepared when additional data review and detailed site investigation (as per mitigation measure SC1) confirms that contamination would require remediation.

Mitigation measure SC4 states that, a NSW EPA-accredited Site Auditor would review and approve the Remediation Action Plan if a duty to report to the NSW Environment Protection Authority under section 60 of the *Contaminated Land Management Act 1997* is triggered, or where a medium to high risk of contamination is identified. Interim audit advice would be sought from the Site Auditor as needed, and a revision to mitigation measure SC4 has been made in this regard.

Where the construction footprint is not used as part of the operational footprint (residual land), an assessment of the suitability of the site for the proposed land use would be undertaken in accordance with the statutory guidelines made or endorsed by the NSW EPA (mitigation measure SC10).

Principal contractors would develop and implement a Soil and Water Management Plan for their scope of works as outlined in the Construction Environmental Management Framework (Appendix E). In accordance with mitigation measure SC1, the Soil and Water Management Plan would include measures for managing low risk areas of environmental concern and measures for undertaking Detailed Site Investigations and review of additional data for medium and high risk areas of environmental concern. Mitigation measure SC5 requires the development and implementation of an unexpected finds protocol as part of the Soil and Water Management Plan.

Conditions of approval are a matter for the Department of Planning, Industry and Environment to consider during its assessment of the project.

5.9 Heritage NSW (Heritage Council of NSW)

5.9.1 Non-Aboriginal heritage

St Marys Railway Station Group

Issues raised

Heritage NSW raised concerns with dismantling and reassembling items of high heritage significance, but acknowledged that the project has significant constraints and technical requirements which may require this.

Heritage NSW recommended:

- impacts on built structures within the State Heritage listed curtilage are monitored during construction
- specific measures for managing the jib crane during construction
- further detail of the proposed St Marys Station is provided to further inform Heritage NSW's assessment
- specific requirements for managing the proposed station building during operation are identified.

Response

The non-Aboriginal heritage assessment assessed the concept design of the station which included detail on the location and relationship of the new station with significant elements of the existing station. The assessment determined that vibration may have the potential to result in cosmetic structural damage to the Goods Shed which would be retained in-situ. Potential vibration impact on other heritage significant structures of the station would be negligible. As described in Table 7-2, mitigation measure NAH2 requires advice to be sought to develop solutions to manage potential ground movement impacts and NAH6 requires monitoring for the St Marys Railway Station Group to manage potential vibration impacts during construction.

Mitigation measure GW3 also requires further assessment of potential ground movement impacts on the Goods Shed building at St Marys Station, including a building condition survey to be carried out during design development and prior to the commencement of construction. If required, feasible measures to reduce or mitigate the effects of ground movement on this structure. A dilapidation survey of the Goods Shed would be carried out prior to work commencing in the vicinity of the building. At the completion of construction, should there be any damage to the building which is determined to be as a result of the project construction works, the building would be repaired in consultation with a suitably qualified heritage architect.

The Archaeological Research Design (Appendix K) documents uncertainty about whether the jib crane was relocated from its original position to where it is currently which would have involved the removal

and reinstatement of all significant elements of the crane (including concrete plinth) based on evidence from historical plans. The crane is not currently in operation.

The Environmental Impact Statement identified that relocation of the crane from its current position may be required as a result of the potential relocation of the lift shaft on the southern side of St Marys Station. The need to relocate the crane prior to construction would be confirmed following further design development and construction planning.

Mitigation measure NAH7 has been revised to clarify that temporary relocation of the jib crane would only occur if required. Sydney Metro would continue to provide Heritage NSW with information through consultation as further design development and construction planning is undertaken for the project.

The project would be designed in accordance with the performance outcomes for non-Aboriginal heritage during construction listed in Table 7-1, including requirements to:

- ensure impacts on the State heritage significant St Marys Railway Station Group are avoided or minimised so that the overall heritage value of the item is maintained
- ensure the design of St Marys Station is sympathetic to retained and adjacent heritage items.

The mitigation measures listed in Table 7-2 would be implemented to manage operational impacts on St Marys Railway Station Group. These include requirements for:

- minimising direct and indirect adverse impacts on heritage items (ONAH1)
- designing the project to take account of and to be sympathetic to the local heritage character in consultation with the Design Review Panel and Heritage Working Group (ONAH2)
- consultation with the Heritage Council and relevant stakeholders for the design of works with the potential to impact State significant items including St Marys Railway Station Group (ONAH3)
- preparation of a conservation management plan for St Marys Railway Station Group (ONAH5).

The performance outcomes and mitigation measures for the project would adequately address the specific requirements identified by Heritage NSW for managing the station building during operation.

Sydney Metro would continue to provide Heritage NSW with design and construction information through consultation as further design development is undertaken for the project.

Kelvin

Issues raised

Heritage NSW recommended impacts from excavation of underground tunnels are assessed and mitigation measures provided to ensure Kelvin is protected from any impacts.

Response

The proposed underground tunnels near Aerotropolis Core Station are some distance away (around 600 metres) from the State Heritage listed curtilage of Kelvin. This is far beyond the range at which potential impacts from vibration, groundwater drawdown and settlement is expected.

The proposed underground tunnels would run beneath a section of the former driveway to the Kelvin Park Group homestead from Badgerys Creek Road which is within the Liverpool local environmental plan (LEP) curtilage. The proposed tunnels are at a depth of around 20 metres at this location. There are no above ground structures or archaeological areas of sensitivity that have been identified along the former driveway alignment.

Warragamba to Prospect Water Supply Pipelines

Issues raised

Heritage NSW recommended impacts from tunnel excavation are assessed and mitigation measures provided to ensure that the Warragamba to Prospect Water Supply Pipelines are protected from any impacts.

Heritage NSW recommended consultation with Sydney Water to ensure that no underground infrastructure of historic significance would be impacted.

Response

There are no metro tunnels proposed in the vicinity of the Warragamba to Prospect Water Supply Pipelines. The metro alignment is on viaduct as it crosses the pipelines corridor. The potential impacts of the viaduct crossing on the heritage values of the Warragamba Supply Scheme have been assessed in accordance with *Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines* (WaterNSW, 2020) as required by the Secretary's environmental assessment requirements in Section 5.9 of Technical Paper 4 – Non-Aboriginal heritage.

At this location, the Warragamba to Prospect Water Supply Pipelines are located above ground and no subsurface elements or archaeological remains associated with the Supply Scheme were identified in this location that would be impacted by the project works.

Sydney Metro has consulted and would continue to consult with WaterNSW regarding the design of the project and the proposed construction methodology in the vicinity of the pipelines corridor. The construction performance outcomes outlined in Table 7-1 would ensure structural damage to buildings, heritage items and public utilities and infrastructure, including the Warragamba to Prospect Water Supply Pipelines, from construction vibration and ground movement are avoided.

Mitigation measure NV2 also requires a detailed construction vibration assessment to be undertaken for the Warragamba to Prospect Water Supply Pipelines in accordance with the *Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines* to ensure potential vibration impacts on the Warragamba to Prospect Water Supply Pipelines are avoided. Mitigation measures HR4 also requires that where the project crosses or is adjacent to the Warragamba to Prospect Water Supply Pipelines, construction planning and approaches to minimising risks of damage or rupture of the Warragamba to Prospect Water Supply Pipelines to be developed in consultation with WaterNSW, and in accordance with the *Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines*.

Consultation with Sydney Water is ongoing to ensure they are informed about the project and have opportunities to provide feedback to the project team. This consultation would continue throughout design development and construction planning.

Historical archaeology

Issues raised

Heritage NSW noted that commitments to further archaeological investigation, a non-Aboriginal Archaeological Research Design and a procedure for the unexpected discovery of human remains are adequate to manage the potential historical archaeological impacts. Heritage NSW recommended advice be sought from the relevant local council regarding potentially impacted local heritage items.

Response

Heritage NSW's comments on the adequacy of the commitments to manage the historical archaeological impacts of the project are noted. The Archaeological Research Design is provided in Appendix K and outlines further archaeological investigation that may be undertaken for the project should it be required.

If suspected human remains or unexpected items of potential heritage significance are discovered, this would be managed by mitigation measure NAH9.

Consultation with Penrith City Council and Liverpool City Council is ongoing to ensure they are informed about the project and have opportunities to provide feedback to the project team, including on local heritage items. This consultation would continue throughout design development and construction planning.

5.10 Heritage NSW (Aboriginal Cultural Heritage Regulation Branch)

5.10.1 Aboriginal heritage

Aboriginal Cultural Heritage Assessment Report

Issues raised

Heritage NSW identified that the Aboriginal Cultural Heritage assessment as included in the exhibited Environmental Impact Statement is still incomplete for a thorough review and submission. Therefore,

previous Heritage NSW comments on the draft Aboriginal Cultural Heritage Assessment Report are reiterated.

Heritage NSW acknowledged Aboriginal consultation and test excavations are on-going and noted the importance of continued Aboriginal consultation on the investigation results for the Aboriginal Cultural Heritage Assessment Report.

Response

As outlined in Section 2.3, Sydney Metro has undertaken consultation with Heritage NSW specifically to discuss their comments regarding the draft Aboriginal Cultural Heritage Assessment Report and to confirm that these comments would be addressed in the Revised Aboriginal Cultural Heritage Assessment Report (Appendix H).

The outcomes of Aboriginal heritage test excavations and associated consultation undertaken since public exhibition of the Environmental Impact Statement are summarised in Section 6.6.2 and provided in the Revised Aboriginal Cultural Heritage Assessment Report. The Aboriginal Cultural Heritage Management Plan (Appendix I) has also been prepared and documents the process for areas still requiring test excavation. The Revised Aboriginal Cultural Heritage Assessment Report and Aboriginal Cultural Heritage Management Plan have been developed in consultation with Registered Aboriginal Parties.

5.11 WaterNSW

5.11.1 Noise and vibration

Mitigation, management and monitoring

Issues raised

WaterNSW recommended:

- construction and operational vibration impacts are effectively managed to minimise adverse impacts on the structural integrity of WaterNSW assets and heritage items
- the prescribed maximum vibration level of 2.5mm/s PPV be removed from mitigation measure NV2 as the velocity limits for construction and operation activities will be agreed in accordance with the German Standard when the construction contractor is engaged
- project approval be subject to a condition which requires specific mitigation measures to be implemented over WaterNSW infrastructure to achieve agreed vibration limits, determined in accordance with the German Standard.

Response

Potential construction and operational vibration impacts are assessed in Section 10.5 and 10.6 of the Environmental Impact Statement. The project would be designed in accordance with the performance outcomes for vibration outlined in Table 7-1 which requires structural damage to buildings, heritage items and public utilities and infrastructure, including the Warragamba to Prospect Water Supply Pipelines, from construction vibration are avoided.

As outlined in Table 7-2, mitigation measure NV2 has been revised to remove the prescribed maximum vibration level and refer only to the German Structural Vibration Standard.

Conditions of approval are a matter for the Department of Planning, Industry and Environment to consider during its assessment of the project.

5.11.2 Non-Aboriginal heritage

Historic archaeology

Issues raised

WaterNSW raised concern that the non-Aboriginal heritage assessment does not discuss or consider archaeological potential and requests that archaeological potential is discussed for all identified non-Aboriginal heritage items.

Response

Archaeological potential is discussed in Chapter 6 of Technical Paper 4 – Non-Aboriginal heritage. Only those areas or items which were within the construction footprint and had evidence of likely significant sub-surface non-Aboriginal archaeological remains were included in the assessment.

Subsurface elements associated with the Warragamba to Prospect Water Supply Pipelines were identified from historical research (including the detailed Conservation Management Plan for the item) or from the comprehensive site survey. No subsurface elements or archaeological remains associated with the Warragamba to Prospect Water Supply Pipelines were identified in this location that would be impacted by the project works.

Design development would continue to be undertaken in accordance with *Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines* (WaterNSW, 2020). The Construction Environmental Management Framework would also be implemented to minimise heritage impacts, including a procedure for managing unexpected finds.

5.11.3 Flooding, hydrology and water quality

Mitigation, management and monitoring

Issues raised

WaterNSW emphasised that no changes to current ground conditions or hydrology on WaterNSW land can occur as a result of the project and recommended mitigation measures are included to ensure there is no increase in surface water flows into or across the Warragamba to Prospect Water Supply Pipelines corridor of quantity, quality or velocity for each storm event up to and including 1 per cent AEP event.

Response

Sections 5.1.1 of Technical Paper 6 (Flooding, hydrology and water quality) of the Environmental Impact Statement addresses works for viaduct structures and notes that surface water would be managed to ensure it is not directed into the Warragamba to Prospect Water Supply Pipelines corridor. Section 5.1.2 of Technical Paper 6 discusses water quality and notes that the works would be undertaken in accordance with WaterNSW guidelines to ensure no stormwater runoff enters the pipelines corridor.

Two new mitigation measures have been added as described in Table 7-2:

- HYD3 which requires surface water flows during construction to be managed to ensure that there is no increase in flows into or through the Warragamba to Prospect Water Supply Pipelines corridor
- OHYD4 which requires design of the viaduct crossing over the Warragamba to Prospect Water Supply Pipelines would not result in an increase of overland flows into or through the pipelines corridor for each storm event up to and including the 1 per cent AEP event.

5.11.4 Soils and contamination

Erosion and sediment control

Issues raised

WaterNSW recommended bulk earthworks are designed and undertaken in a manner that does not impact on the Warragamba to Prospect Water Supply Pipelines corridor. Project approval should be subject to conditions which require appropriate dust suppression measures and installation of erosion and sediment controls in accordance with *Managing Urban Stormwater: Soils & Construction Volume 1 and 2* prior to construction.

Response

The Construction Environmental Management Framework (Appendix E) requires the development and implementation of an Air Quality Management Plan which would include measures to suppress and manage dust emissions (refer to clauses 13.2 and 13.3). The Construction Environmental Management Framework also requires the development and implementation of Erosion and Sediment Control Plans in accordance with clause 12.2 of *Managing Urban Stormwater: Soils & Construction Volume 1 and 2*. The Construction Environmental Management Plan would be prepared in accordance with the Construction Environmental Management Framework, conditions of approval for the project (if

the project is approved) and the commitments made within the Environmental Impact Statement and this report.

The project would also be designed to meet the performance outcomes for flooding, hydrology and water quality outlined in Table 7-1 including the requirement for no aspect of construction to materially adversely affect existing water quality in receiving waters to a minimum 0.5 EY storm event, or in line with *Managing Urban Stormwater: Soils & Construction Volume 1 and 2*.

5.11.5 Hazard and risk

Mitigation, management and monitoring

Issues raised

WaterNSW raised the following comments:

- the utility protection measures outlined in the Environmental Impact Statement are appropriate
- consultation must be undertaken with WaterNSW regarding Warragamba to Prospect Water Supply Pipelines for construction planning and approaches to minimise risks of damage, the Construction Environmental Management Plan, a construction schedule and detailed design drawings
- the project must be designed in accordance with the *Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines*
- a dilapidation report should be prepared identifying the condition of all relevant infrastructure within the Warragamba to Prospect Water Supply Pipelines corridor
- all practical measures to protect the Warragamba to Prospect Water Supply Pipelines infrastructure are to be implemented
- no materials are to be lifted over the Warragamba to Prospect Water Supply Pipelines without written approval from WaterNSW
- recommended conditions relating to access, damage, notification and compliance with WaterNSW requirements.

Response

WaterNSW's support for the utility protection measures outlined in the Environmental Impact Statement is noted.

Construction planning and design development would continue to be undertaken in accordance with *Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines*.

Sydney Metro would continue to work with WaterNSW during design development and construction to ensure that potential impacts on the pipelines' infrastructure are avoided and works in the vicinity of the pipelines are appropriately managed.

The following mitigation measures would be implemented to manage potential impacts on the Warragamba to Prospect Water Supply Pipelines:

- NV2 which requires a detailed construction vibration assessment to be undertaken prior to construction commencing
- NAH8 which requires a dilapidation survey of the Warragamba to Prospect Water Supply Pipelines prior to construction commencing
- GW2 which requires further assessment of utility assets considered to be at risk from ground movement (including the Warragamba to Prospect Water Supply Pipelines)
- HR4 which requires construction planning and approaches to minimise risk of damage to the Warragamba to Prospect Water Supply Pipelines to be developed in consultation with WaterNSW and in accordance with the relevant WaterNSW guidelines
- OHR3 which requires that the design of the project would aim to minimise risk of damage to the Warragamba to Prospect Water Supply Pipelines in consultation with WaterNSW and in accordance with the relevant WaterNSW guidelines.

Sydney Metro would continue to liaise with WaterNSW in regard to managing access to, and maintaining the security of, the pipelines corridor and would obtain the relevant access through WaterNSW as required under the *Water NSW Act 2014*.

Sydney Metro and WaterNSW are working towards a third party agreement regarding the management of potential impacts on the Warragamba to Prospect Water Supply Pipelines. WaterNSW requirements relating to the notification of incidents that affect the pipelines corridor are noted and would be incorporated into relevant Construction Environmental Management Plans.

5.12 Sydney Water

5.12.1 Support for the project

Issues raised

Sydney Water expressed their support for the project and acknowledged its contribution to the Western Parkland City and Aerotropolis.

Response

Sydney Water's support for the project is noted.

5.12.2 Planning and assessment process

Sydney Water Act 1994

Issues raised

Sydney Water requested to add *Sydney Water Act 1994* to Section 4.1 of the Environmental Impact Statement.

Response

Appendix B (Statutory approvals framework) of the Environmental Impact Statement sets out the NSW and Commonwealth environmental planning and approvals processes as they apply to the project. The *Sydney Water Act 1994* is not applicable under the three principal statutory schemes that govern the planning and approvals process for the project, which are described in Section 4.1 of the Environmental Impact Statement.

5.12.3 Biodiversity

Culvert crossings

Issues raised

Sydney Water requested further details of construction methodologies for culverts and creek crossings to identify risks which may adversely affect local biodiversity and water quality.

Response

The project would be designed to meet the performance outcomes for biodiversity and water quality listed in Table 7-1, which includes the following requirements:

- culverts and bridges would be appropriately sized to maintain fauna habitat connectivity
- drainage from the project (including the stabling and maintenance facility, service facilities and stations) designed in accordance with local council requirements for managing urban stormwater quality and quantity

A new mitigation measure (WQ3) has been included which identifies the design and construction of the project would take into account the former NSW Office of Water's Guidelines for controlled activities on waterfront land. This would enable the mitigation of potential impacts on water quality including within riparian corridors.

Sydney Metro would continue to work with Sydney Water to ensure they are informed about the project and have opportunities to provide feedback to the project team. This consultation would continue throughout design development where culvert and crossings design and construction methodologies are refined.

5.12.4 Flooding, hydrology and water quality

Mitigation, management and monitoring

Issues raised

Sydney Water raised the following comments:

- recommends consideration of mitigation measures to minimise or eliminate potential flooding and degradation of water quality
- existing flood models should be adopted to ensure the project does not impact on flooding
- Sydney Metro should work closely with the Western Sydney Planning Partnership Office to support precinct planning for the Aerotropolis and waterway health
- the project needs to demonstrate compliance with the NSW Water Quality Objectives including a range of water quality indicators: A risk-based framework for considering waterway health outcomes in strategic land-use planning decisions.

Response

The project would be designed to meet the following performance outcomes for flooding, hydrology and water quality listed in Table 7-1:

- water discharged from the project, including runoff from hardstand areas, surface and ground water storages would:
 - contribute towards achieving ANZECC guideline water quality trigger values for physical and chemical stressors for slightly disturbed ecosystems in lowland rivers in southeast NSW, or
 - meet any water quality criteria determined in consultation with the NSW Environment Protection Authority (off-airport) where an Environment Protection Licence is required or in consultation with Western Sydney Airport in accordance with the Airports Regulations (on-airport).

Mitigation measure OHYD1 requires the flood model for the project to be updated having regard to the flood modelling undertaken for the South Creek Sector Review by Infrastructure NSW. The updated flood model for the project would inform detailed design.

Sydney Metro would continue to consult with relevant stakeholders including Western Sydney Planning Partnership to ensure the successful delivery of the project within the Aerotropolis.

Section 2.1.2 of Technical Paper 6 – Flooding, hydrology, and water quality outlines the State legislation and policy documents considered for the assessment, including the *NSW Water Quality and River Flow Objectives* (DECCW, 2006). At the time the NSW Water Quality and River Flow Objectives were approved by the government, the NSW Healthy Rivers Commission was reviewing a number of catchments including the Hawkesbury-Nepean. As such the NSW Water Quality and River Flow Objectives do not provide environmental values for the Hawkesbury-Nepean catchment. Water quality objectives are instead recommended for this catchment in the Independent Inquiry into the Hawkesbury Nepean River System (HRC, 1998) and the associated Lower Hawkesbury-Nepean nutrient management strategy (HRC, 1998).

5.12.5 Groundwater and geology

Groundwater discharge

Issues raised

Sydney Water recommended that groundwater discharge or runoff to local waterways is evaluated against Sydney Water and Department of Planning, Industry and Environment frameworks and should reflect a future vision of naturally functioning waterways which meet community's environmental expectations.

Sydney Water recommended project approval be subject to a condition which requires discharge to meet the discharge protocols of chlorinated water due to watermain shutdown and reconnection of live Sydney Water assets that will require adjustment.

Response

The details of the treatment and discharge regime would be confirmed during further design development. The project would be designed to meet the performance outcomes for flooding, hydrology and water quality listed in Table 7-1, which includes the following requirements:

- water discharged from the project, including runoff from hardstand areas, surface and ground water storages would:
 - contribute towards achieving ANZECC guideline water quality trigger values for physical and chemical stressors for slightly disturbed ecosystems in lowland rivers in southeast NSW, or
 - meet any water quality criteria determined in consultation with the NSW Environment Protection Authority (off-airport) where an Environment Protection Licence is required or in consultation with Western Sydney Airport in accordance with the Airports Regulations (on-airport).

5.12.6 Soils and contamination

Request for additional information

Issues raised

Sydney Water requested further information on future action Sydney Water would take if tests indicate existence of contamination in groundwater.

Response

Mitigation measure SC5 requires an unexpected finds procedure to be developed and implemented as part of the Soil and Water Management Plan, outlining a set of potential contamination issues which could be encountered, and detailing the corrective actions to be implemented.

Groundwater would be investigated in Detailed Site Investigations and assessed against applicable human health and ecological based criteria. If concentrations exceed criteria, a risk-based approach would be undertaken to assess whether remediation is required. Where groundwater is extracted it would be treated to meet discharge limits prior to discharge.

Western Sydney International flooding impacts

Issues raised

Sydney Water raised concern that flooding impacts resulting from construction of Western Sydney International need to be understood to manage emerging equity issues for landholders.

Response

Flooding impacts as a result of the operation of Western Sydney International are beyond the scope of the Sydney Metro – Western Sydney Airport project. The final landform within the Western Sydney International site will be determined by the airport development. Potential on-airport flooding impacts of the project are based on the modelling completed for the Western Sydney Airport Environmental Impact Statement and the project. This assessment is included in Section 14.6.2 of the Environmental Impact Statement.

5.12.7 Sustainability

Water use

Issues raised

Sydney Water recommended the efficient use of drinking water, development of a water-use balance for the project lifecycle and that alternative water sources be fit for purpose. Recycled water should also be considered for the project and should be incorporated into the water balance model in consultation with Sydney Water.

Response

The project would be designed to meet the performance outcomes for resource management listed in Table 7-1 to ensure the conservation of natural resources is maximised. These include the requirement to ensure the use of potable water for non-potable purposes is avoided if non-potable water is available.

As required by mitigation measure SUS1 and OSUS1, a Sustainability Plan would be developed and implemented during construction and operation of the project. The Sustainability Plan would identify the sustainability, climate change and greenhouse gas objectives, initiatives and targets which would be implemented during further design development, construction and operation of the project. The Sustainability Plan would be developed to be consistent with the Western Sydney Airport Sustainability Plan for on-airport works. It would also inform the preparation of individual Sustainability Management Plans for each construction work package.

5.12.8 Land use and property

Pipeline easements

Issues raised

Sydney Water recommended the project create pipeline easements where required in consultation with councils.

Response

Sydney Metro would continue to work with Sydney Water and local councils to ensure they are informed about the project and have opportunities to provide feedback to the project team. This consultation would continue throughout design development including consideration of opportunities to provide pipeline easements.

5.12.9 Cumulative impacts

Mitigation, management and monitoring

Issues raised

Sydney Water encouraged early consultation with Sydney Metro to manage potential cumulative impacts of the project and the Upper South Creek Advanced Water Recycling Centre project which is scheduled to be delivered by Sydney Water by 2025 (subject to approval).

Response

Sydney Metro would continue to work with stakeholders, including Sydney Water, and the community to ensure they are informed about the project and have opportunities to provide feedback. As per mitigation measure CL1, coordination and consultation with key stakeholders, including Sydney Water, local councils and other government agencies would occur where required to manage the interface of projects under construction at the same time. The Overarching Community Communications Strategy (Appendix C) outlines the approach to coordinating communications between interfacing projects.

5.12.10 Public utilities

Mitigation, management and monitoring

Issues raised

Sydney Water recommended the following:

- early and ongoing consultation with Sydney Metro for the project
- all existing and future assets are identified early
- compilation of an asset impact risk register listing all potentially impacted assets in risk priority
- satisfactory measures be taken to protect existing stormwater assets, such as avoiding building over and/or adjacent to stormwater assets
- the project be subject to conditions of approval relating to access, coordination, consultation regarding existing and future assets, protection and compliance with Sydney Water requirements
- Sydney Water must be able to continue to provide existing services line with their Operating Licence
- extension of the existing Interface Deed between Sydney Water and Transport for NSW to cover the project at Western Sydney International
- all trade waste licence requests meet Sydney Water's requirements.

Response

Further consultation with Sydney Water would occur via a utilities coordination manager and include consideration of impacts on Sydney Water assets. The role of the utilities coordination manager is discussed in Section 8.9.11 of the Environmental Impact Statement. Table 8-11 of the Environmental Impact Statement provides a preliminary list of major utilities that could be affected by construction and may require protection and/or relocation. This list is subject to design refinement, site investigations and detailed assessment in consultation with asset owners including Sydney Water.

Sydney Metro would continue to work with Sydney Water to ensure they are informed about the project and that potential impacts to Sydney Water assets are managed appropriately.

The project would be delivered in accordance with all relevant legislative requirements and standards. Sydney Water would be consulted regarding water supply requirements and disposal via any Sydney Water Trade Waste agreements during construction planning.

Request for additional information

Issued raised

Sydney Water recommended further work be undertaken to assess the impact of the project, especially for bridges over Sydney Water assets.

Response

Viaduct and bridge designs would be subject to further development through detailed design. Sydney Metro would continue to work with Sydney Water to ensure they are informed about the project and have opportunities to provide feedback to the project team. This consultation would continue throughout design development where viaduct and bridge design and construction methodologies are refined.

5.13 TransGrid

5.13.1 Public utilities

Mitigation, management and monitoring

Issues raised

TransGrid requested continued consultation regarding the project and requests further detailed designs to ensure the safety and protection of all TransGrid assets.

Response

Major utilities that could be impacted by construction of the project were identified in Section 8.9.1 of the Environmental Impact Statement, including several TransGrid high voltage overhead power lines.

Further consultation with TransGrid would occur via a utilities coordination manager and include consideration of impacts on TransGrid assets. The role of the utilities coordination manager is discussed in Section 8.9.11 of the Environmental Impact Statement.

Sydney Metro would continue to work with stakeholders, including TransGrid during design development to ensure they are informed about the project, manage the potential interface between the project and TransGrid infrastructure and have opportunities to provide feedback.

5.14 University of Sydney

5.14.1 Land use and property

Property acquisition

Issues raised

The University of Sydney raised concern that there is no differentiation between land to be acquired and land to be leased, no justification for the extent of land acquisition and that the width of the corridor exceeds the corridor zone SP2 Infrastructure under the Corridors SEPP.

Response

The design of the project has sought to minimise the need to acquire properties, in particular north of the M4 Western Motorway and south of Western Sydney International, where the project would be

located in tunnel. Sections 19.5 and 19.6 of the Environmental Impact Statement provide an assessment of property acquisition and leasing as a result of the project. Figure 19-10 of the Environmental Impact Statement shows the properties that would be temporarily leased (in blue) and fully or partially acquired (in orange and yellow) for the project.

Table 6-10 of the Environmental Impact Statement describes how the project was developed to minimise impacts outside of the North South Rail Line corridor, which is now gazetted (along with other corridors and future extensions) under the Corridors SEPP. The project would predominantly follow the gazetted North South Rail Line corridor between south of Orchard Hills and the Aerotropolis. Supporting infrastructure such as the stabling and maintenance facility, construction sites and operational systems would be located outside of the North South Rail Line corridor.

The Corridors SEPP also establishes planning provisions around further development adjacent to the corridor. Major transport infrastructure projects require a larger construction footprint (by comparison to the operational rail corridor) temporarily to accommodate construction sites, activities, equipment and workers necessary to efficiently deliver the project within the construction program. Wherever possible, construction footprints have been located within the final operational footprint, to minimise additional property impacts and avoid property impacts only required during construction.

The extent of partial property acquisition required for the construction of the project would be confirmed during design development and in consultation with affected property owners.

Land severance and fragmentation

Issues raised

The University of Sydney raised concern that the project will fragment the McGarvie Smith Farm property, with no opportunity provided to cross the corridor identified and that this will also create isolated pockets of land that are inaccessible.

Response

Sections 19.5 and 19.6 of the Environmental Impact Statement provides an assessment of land severance and fragmentation a result of the project.

For the aboveground sections of the project, construction activities have the potential to physically divide areas through the establishment of site fencing and hoardings. This is particularly relevant for the surface sections of the project alignment from Orchard Hills to Elizabeth Drive, where it would be necessary to establish a linear construction worksite (the off-airport construction corridor, described in Section 8.7.4 of the Environmental Impact Statement). In this area, agricultural operations may be potentially impacted during construction as a result of temporary changes in access to properties or farm infrastructure such as fencing near the construction footprint.

For properties where portions of land may be divided by a construction site, access may be temporarily affected. Access locations may be required to move during the construction phase to ensure the safety of both landholders and contractors.

A new construction mitigation measure (LU3) has been added in response to the submissions received on this issue which requires that where a property would be potentially fragmented by the construction corridor, access to properties would be maintained in consultation with the landowner. Mitigation measure LU2 also requires that, where property adjustments have the potential to impact farm infrastructure (such as fencing and dams) or local access to properties, consultation with affected property owners would be carried out prior to these works occurring, in order to determine reasonable, feasible and acceptable solutions.

On completion of construction, Sydney Metro would consult with The University of Sydney to ensure access to all portions of the affected land and that no inaccessible pockets of land would remain. A new operational mitigation measure (OLU1) has been added in response to the submissions received on this issue which outlines that where a property would be potentially fragmented by the rail corridor, access to properties would be provided. The location of access to be provided would be agreed in consultation with the landowner.

Consultation would continue to be undertaken with The University of Sydney in this regard.

The future M12 Motorway corridor is also to be located in this area. The potential cumulative impacts of the project and the future M12 Motorway including land fragmentation are assessed in Chapter 24 (Cumulative impacts) of the Environmental Impact Statement and this issue is responded to in Section 4.17.

On-site detention and water quality basins

Issues raised

The University of Sydney raised concern regarding the lack of details for the justification, number, size and location of the proposed operational water quality basins on the McGarvie Smith Farm property.

The University of Sydney also raised that the flood impact criteria are based on current land use and do not take account of the zoned land use.

Response

Chapter 7 (Project description – operation) of the Environmental Impact Statement states that on-site detention may be needed during operation and that the final number, size of, and need for, the proposed detention and water quality basins would be confirmed during design development.

The indicative locations of onsite detention and water quality basins have been designed to limit design outflows to the existing 1 per cent AEP peak flow. Further assessment and design of the detention basins is required during design development and would include consideration of cumulative impacts of adjacent approved projects.

The extent of partial property acquisition required for the construction of the project would be confirmed during design development and in consultation with affected property owners.

Mitigation measure OHYD1 requires the flood model for the project to be updated with regard to the flood modelling undertaken for the South Creek Sector Review (anticipated to be released in 2021) and would include updated calibration and validation. The updated flood modelling would be used to inform design development and would consider zoned land use at that time to meet the operational performance outcomes for the project requiring:

- for all land currently flooded up to the one per cent annual exceedance probability event, no change to peak flood levels up to nominated limits for specified land uses unless otherwise agreed with the affected property owner
- no change to the one per cent annual exceedance probability duration of inundation up to nominated limited for specified land uses.

5.15 Western Sydney University

5.15.1 Project development and alternatives

Station location alternatives

Issues raised

Western Sydney University raised concern that no station is proposed at Werrington, disagreed with the assessment in the Environmental Impact Statement that a station at Western Sydney University would perform poorly against the assessment criteria and believe that no station at Werrington does not support the project objective of supporting the Western Parkland City.

Response

Sydney Metro – Western Sydney Airport has been designed to deliver fast and efficient metro services, and preferred station locations are determined to get the best customer and community outcomes.

A number of station locations were considered to connect the T1 Western Line to the new Aerotropolis as part of the project development. The analysis of station precinct options and the outcome of this assessment is documented in Section 6.4 of the Environmental Impact Statement.

Section 6.4.2 of the Environmental Impact Statement outlines that of the long list of options considered, both St Marys and Werrington were shortlisted for further assessment. Based on the shortlist evaluation provided in Table 6-1 of the Environmental Impact Statement, St Marys was identified as the preferred option for a connection with the T1 Western Line by best meeting the criteria of customer needs, supporting Western Sydney International and the Western Parkland City, productivity and employment, transport integration, urban renewal and place making and sustainable and deliverable solution.

The assessment in Section 6.4 of the Environmental Impact Statement showed that a station at Western Sydney University's Werrington precinct would perform poorly against the 'sustainable and

deliverable solution' objective and would have considerable construction, program and interface impacts and risk which outweighed the benefits of a station in this location. Further, Western Sydney University students and associated jobs growth would be outside of a 15-minute walking catchment from a station at Western Sydney University's Werrington precinct.

A more direct tunnel route between St Marys and Orchard Hills provides cost benefits in delivery of the project and travel time savings, by connecting the airport faster to the key T1 Western Line interchange at St Marys.

Compared with a station (and associated tunnel infrastructure) at St Marys and Orchard Hills, a station at Western Sydney University would:

- need to be constructed concurrently with tunnelling activities that would also need to be located at the station site, resulting in a very large property impact requirement
- require the launch and support of four TBMs (instead of two) for the St Marys to Orchard Hills tunnel in addition to station construction requirements
- result in greater travel times for customers travelling between Western Sydney International and St Marys
- require an additional three kilometres of tunnel length that would require two tunnel portal facilities (compared with up to one as part of the tunnel between St Marys and Orchard Hills), increasing comparative costs and affecting overall value-for-money.

Currently, the Western Sydney University Werrington Campus can be accessed from Kingswood Station or Werrington Station via shuttle bus, cycling, walking, bus, or driving.

Chapter 9 (Transport) of the Environmental Impact Statement outlines that the project would integrate seamlessly with the station precincts and existing and future transport interchange facilities, providing connectivity with pedestrian, cycling and public transport networks, and providing opportunities for integration with future land uses and infrastructure. Indicative transport interchange provisions proposed specifically at St Marys Station and Orchard Hills Station (the two closest metro stations to the Western Sydney University Werrington Campus) are also outlined in Section 9.6.1 of the Environmental Impact Statement.

5.15.2 Project description – operation

Future transport solutions

Issues raised

Western Sydney University emphasised the importance of future transport solutions, such as a rapid bus network, being developed in consultation with stakeholders (including Western Sydney University) to achieve an integrated transport solution.

Response

Chapter 9 (Transport) of the Environmental Impact Statement outlines that the project would integrate seamlessly with the station precincts and existing and future transport interchange facilities, providing connectivity with pedestrian, cycling and public transport networks, and providing opportunities for integration with future land uses and infrastructure. Indicative transport interchange provisions proposed specifically at St Marys Station and Orchard Hills Station (the two closest metro stations to the Western Sydney University Werrington Campus) are also outlined in Section 9.6.1 of the Environmental Impact Statement.

Strategic planning for future transport solutions would be undertaken by Transport for NSW in consultation with Sydney Metro and relevant stakeholders, including Western Sydney University. Other future transport solutions, such as a rapid bus network, is beyond the scope of the project.

5.16 Urban Development Institute of Australia NSW

5.16.1 Support for the project

Issues raised

Urban Development Institute of Australia (UDIA) expressed their support for the project and its contribution to supporting the Western Parkland City and Western Sydney International.

Response

UDIA's support for the project is noted.

5.16.2 Project development and alternatives

Station location options

Issues raised

UDIA raised concern that no justification is provided for the single route, location and number of proposed stations and recommends consideration of additional stations.

Response

A guiding principle for the project is to offer fast, high frequency services to key activity centres and facilitate a 30-minute city. A range of factors influence travel time, including the number and location of stations. A primary consideration in the project development process was to provide a balance between the number and location of stations, considering drivers such as productivity and land use benefits, accessibility, travel times and project cost. This process of station precinct identification was undertaken independently of the rail corridor alignment development process. The challenge of balancing the optimal number and location of stations with travel times has a direct influence over the land use outcomes, economic benefits, expanded customer catchments and increased network connectivity.

Section 6.4 of the Environmental Impact Statement provides the station precinct options analysis undertaken for the project. The options assessment for the identification of the preferred station precincts is shown in Figure 6-2 of the Environmental Impact Statement. Intermediate stations locations between the T1 Western Line and Western Sydney International were considered as part of the long-list of station precincts. A number of station precincts were identified based on specific drivers which were independent of the rail corridor alignment process. Intermediate station locations are presented in Figure 6-4 of the Environmental Impact Statement.

Further information regarding consideration of station location options is provided in Section 4.4.2.

Route selection

Issues raised

UDIA raised concern that the route assessment provided in the Environmental Impact Statement is limited.

Response

Chapter 6 (Project development and alternatives) of the Environmental Impact Statement discusses the rail corridor planning, strategic alternatives, station precinct options and alignment options for the project.

The project is based on the outcomes of a joint NSW and Australian Government rail needs scoping study described in the Scoping Study which identified a north–south rail corridor connecting Schofields/Tallawong in Rouse Hill with Macarthur via St Marys and Western Sydney International as critical for the future of the Western Parkland City. The Scoping Study identified that a separated metro or light metro style of train would suit a north–south rail link.

To improve the economic viability of the recommended north–south rail link, it was determined that it should be built in stages to better match the demand of a growing Western Sydney. The Scoping Study suggested that a connection between St Marys and the Aerotropolis would be a suitable first stage, with subsequent future connections to the north (to Schofields/Tallawong and the Sydney Metro Northwest in Rouse Hill) and to the south (to Macarthur) (see Figure 1-1). This approach to rail connectivity for the Western Parkland City is also reflected in *Future Transport 2056*, which identifies a range of committed transport initiatives, as well as future transport investment initiatives that will be subject to further investigation.

Transport for NSW exhibited a draft North South Rail Line corridor between St Marys and the Aerotropolis in March 2018 for community consultation. During development of the project, Sydney Metro worked closely with Transport for NSW to align project outcomes with the North South Rail Line corridor planning process.

A number of alternative horizontal alignments to the draft corridor were investigated during the project's development, including using the Outer Sydney Orbital Stage 1 corridor and alternative T1 Western Line connections (e.g. to Werrington).

The draft North South Rail Line corridor responds to major environmental constraints and physical interfaces including Defence land along the western side of the corridor, South Creek along the eastern side of the corridor and the requirements to connect Western Sydney International and the Aerotropolis Core precinct (the area to be called Bradfield). The draft corridor also connects to locations suitable for development opportunities to support the Western Parkland City, including Luddenham Road, within the Northern Gateway precinct.

The horizontal alignment for the project was therefore broadly determined as a result of the previous corridor planning for the project. Refinements to the horizontal alignment were largely in response to optimised station locations, which identified a direct connection between St Marys and Orchard Hills as the preferred alignment. The North South Rail Line corridor south of Orchard Hills was found to be the most direct option to connect Western Sydney International and St Marys and optimal from an operations, travel time, cost and program perspective.

5.16.3 Project description – operation

Precinct development

Issues raised

UDIA raised concern regarding the lack of detail for precinct planning for the Orchard Hills and Luddenham town centres.

Response

The suburb of Orchard Hills has potential for future development and uplift through higher density residential within the catchment as part of the Greater Penrith to Eastern Creek Growth Investigation Area. The Greater Penrith to Eastern Creek Growth Investigation Area covers a large area from north of Warragamba to Prospect Water Supply Pipelines to south of Marsden Park and provides the opportunity to integrate land use and transport planning at a suitable scale. Growth in appropriate locations can contribute to a connected, vibrant Western Parkland City with more homes, jobs, services and open space. The project is important to support the Greater Penrith to Eastern Creek Growth Investigation Area and would create opportunities for connectivity, renewal and revitalisation with the introduction of stations and precincts that provide a new transport link for the area. Sydney Metro would continue to work with the Greater Penrith to Eastern Creek Growth Investigation Area team within the Department of Planning, Industry and Environment to ensure alignment.

Luddenham Road Station would be located within the Northern Gateway precinct of the Western Sydney Aerotropolis. This precinct is intended to transition from a semi-rural landscape to more intensive urban development. The area around Luddenham is intended to comprise flexible employment and mixed flexible employment and urban land. The *Western Sydney Aerotropolis Plan* provides an overview of proposed land uses surrounding Luddenham Road Station. Placemaking and potential future development of the project would be aligned with the land use planning principles and objectives outlined in this plan. Sydney Metro would continue to work with Western Parkland City Authority and the Western Sydney Planning Partnership to ensure alignment.

A new mitigation measure has been developed (OLU2) which outlines that Sydney Metro would continue to consult with key stakeholders during design development of the station interchanges and precincts.

Figure 7-13 of the Environmental Impact Statement shows how placemaking can be considered from a station perspective, interchange area and the broader precinct in which the station and interchange area are located. As outlined in Section 7.3.3 of the Environmental Impact Statement, Sydney Metro's scope to deliver place outcomes would relate to the physical infrastructure to be delivered as part of the project. Any additional integrated and precinct developments is beyond the scope of the project. Together, these scope elements would include the development of rail infrastructure and station interchange infrastructure such as bike storage and buses and point-to-point interchanges. These are the elements where public domain and transport can be delivered as part of an integrated solution that can respond to complementary land uses within a wider precinct.

There are a range of different stakeholders who would have a role in delivering place outcomes across the project corridor and at station precincts. At all off-airport stations, Sydney Metro would deliver

public domain elements and work with other parts of Transport for NSW and other key stakeholders to deliver transport integration elements beyond the scope of the project.

This would ensure stations and interchanges are attractive, safe, functional and allow for the gathering and movement of people, while also being consistent with the aspirations of the places surrounding them. Within station and interchange areas, Sydney Metro would also explore opportunities for activation, retail and other specialised spaces for the customer and community. This would not extend to the wider precinct planning as this would be refined and delivered by other outside this project.

The final approach and design to placemaking for the project would be undertaken with consideration to current best practices for urban design and placemaking including consideration of the project Design Guidelines (Appendix D), Better Placed (Government Architect of NSW, 2017a) and the principles of Designing with Country (Government Architect of NSW, 2019a). These frameworks and principles are aimed at creating a clear approach to the design of architecture, public places and environments for the future as well as promoting incorporation of Aboriginal knowledge holders' advice in the design of projects.

5.16.4 Stakeholder and community engagement

Consultation

Issues raised

UDIA raised concern regarding the level of consultation undertaken for the project and recommends the development industry are involved in the future planning and delivery of the project.

Response

Stakeholder and community consultation undertaken for the project prior to and during exhibition of the Environmental Impact Statement, as well as details for future consultation are outlined in Chapter 5 (Stakeholder and community engagement) of the Environmental Impact Statement and Chapter 2 (Stakeholder and community consultation).

Consultation undertaken with industry is outlined in Section 5.3.2 of the Environmental Impact Statement. An initial targeted engagement with industry was undertaken in December 2018. The purpose of this engagement was to obtain market information to inform the development of project requirements and a project definition for Sydney Metro – Western Sydney Airport. Further industry engagement was undertaken in May and June 2019, to refine delivery and procurement strategies for the project. Participants across a broad section of relevant delivery market sectors were engaged during this process.

The Sydney Metro project team ensured that government agencies and key stakeholders were proactively engaged and informed about the project during preparation of the Environmental Impact Statement. Regular briefings were held to keep stakeholders informed and to ensure key issues raised were addressed.

Sydney Metro is committed to ongoing consultation with key stakeholders throughout design development of the project to ensure an integrated transport solution is provided which would support future development in the area.

6 Environmental Impact Statement clarifications

This chapter provides clarifications to information presented in the Sydney Metro – Western Sydney Airport Environmental Impact Statement.

6.1 Overview

This chapter provides clarifications to information presented in the Environmental Impact Statement including an assessment of the potential environmental impacts of those clarifications. It also includes details of additional biodiversity, Aboriginal heritage and non-Aboriginal heritage fieldwork carried out since public exhibition of the Environmental Impact Statement.

The clarifications are summarised below:

- updated information to confirm that temporary impacts to driveways in St Marys (as detailed in the Environmental Impact Statement) are no longer required (Section 6.2)
- noise and vibration clarification for one property at Orchard Hills which is considered to be a sensitive receiver (Section 6.3)
- discussion of Sydney Metro guidelines and management frameworks that have been updated following public exhibition of the Environmental Impact Statement (Section 6.4)
- details and associated assessment of the relocation of the temporary bus interchange to the Station Street car park site instead of Nariel Street (as detailed in the Environmental Impact Statement) (Section 6.5)
- details of the removal of one property from the construction footprint, located south of Patons Lane (Section 6.6)
- details and associated assessment of the revised Aerotropolis Core construction site footprint and minor changes to the operational footprint (Section 6.7)
- presentation of results of additional assessment since exhibition of the Environmental Impact Statement for biodiversity, non-Aboriginal heritage, Aboriginal heritage, ground movement, greenhouse gas and cumulative impacts (Section 6.8).

Some of the additional assessments completed since exhibition of the Environmental Impact Statement are a result of design refinements proposed within the Western Sydney International site (on-airport) including a potential additional permanent spoil placement area and changes to the alignment of some internal construction haulage roads. The potential impacts associated with these on-airport design refinements are discussed in this chapter where appropriate but are assessed in detail in the Revised Biodiversity Development Assessment Report (Appendix G) and in the EPBC Act Final Environmental Impact Assessment of on-airport proposed action (EPBC 2019/8541).

6.2 Temporary impact to driveways at St Marys

Potential impact to driveways in the St Marys precinct in the vicinity of the bus interchange on Station Street is discussed in Section 9.6.1 of the Environmental Impact Statement. Some driveways were proposed to be removed or relocated where possible.

The project no longer anticipates the permanent removal or alteration of any private landowner's driveways in St Marys. Any temporary impacts to driveways would be managed throughout construction in accordance with relevant performance outcomes, mitigation measures and the Construction Traffic Management Framework as provided in Appendix G of the Environmental Impact Statement. No additional assessment was required in relation to this change.

6.3 Noise and vibration clarification

Appendix A of Technical Paper 3 – Noise and vibration included the property at 2 Bordeaux Place, Orchard Hills as a non-residential property. The correct classification of the property is residential and the property should be considered a sensitive receiver.

The property is located in NCA 08 and is likely to experience similar construction and operational noise impacts to those predicted for nearby properties in Bordeaux Place and Traminer Grove. No additional assessment was required in relation to this change.

6.4 Revised Sydney Metro management frameworks and guidelines

Subject to the terms of the critical State significant infrastructure approval the delivery of the project would be underpinned by a number of Sydney Metro management frameworks and guidelines that would guide the design development and construction of the project, and that are discussed in, and appended to, the Environmental Impact Statement.

Since the Environmental Impact Statement was finalised for public exhibition a number of these documents have been updated by Sydney Metro. The following documents have been updated:

- Overarching Community Communications Strategy (Appendix C) – minor updates only
- Design Guidelines (Appendix D) – minor updates only
- Construction Environmental Management Framework (Appendix E) – minor updates only
- Construction Noise and Vibration Standard (Appendix F), which was updated to include the following:
 - changes to the additional mitigation measures matrix to relate to noise management levels (NMLs) for the project rather than rating background noise levels
 - clarification of different levels of noise and vibration impact statements (based on the scope of construction works) and clarification of other noise and vibration-related documents
 - removal of limitations on the use of plant and equipment if their use is justified
 - change to the assessment approach to sleep disturbance in accordance with a submission made by the Environment Protection Authority
 - minor text changes and factual corrections.

In addition, Sydney Metro's new Environment and Sustainability Statement of Commitment was released in December 2020. This document confirms that Sydney Metro is committed to:

- minimising impacts and leaving a positive environmental and social legacy
- delivering a resilient asset and service for customers
- collaborating with stakeholders to innovate and drive sustainable outcomes
- embedding sustainability into their activities.

6.5 Temporary bus interchange at St Marys

6.5.1 Description

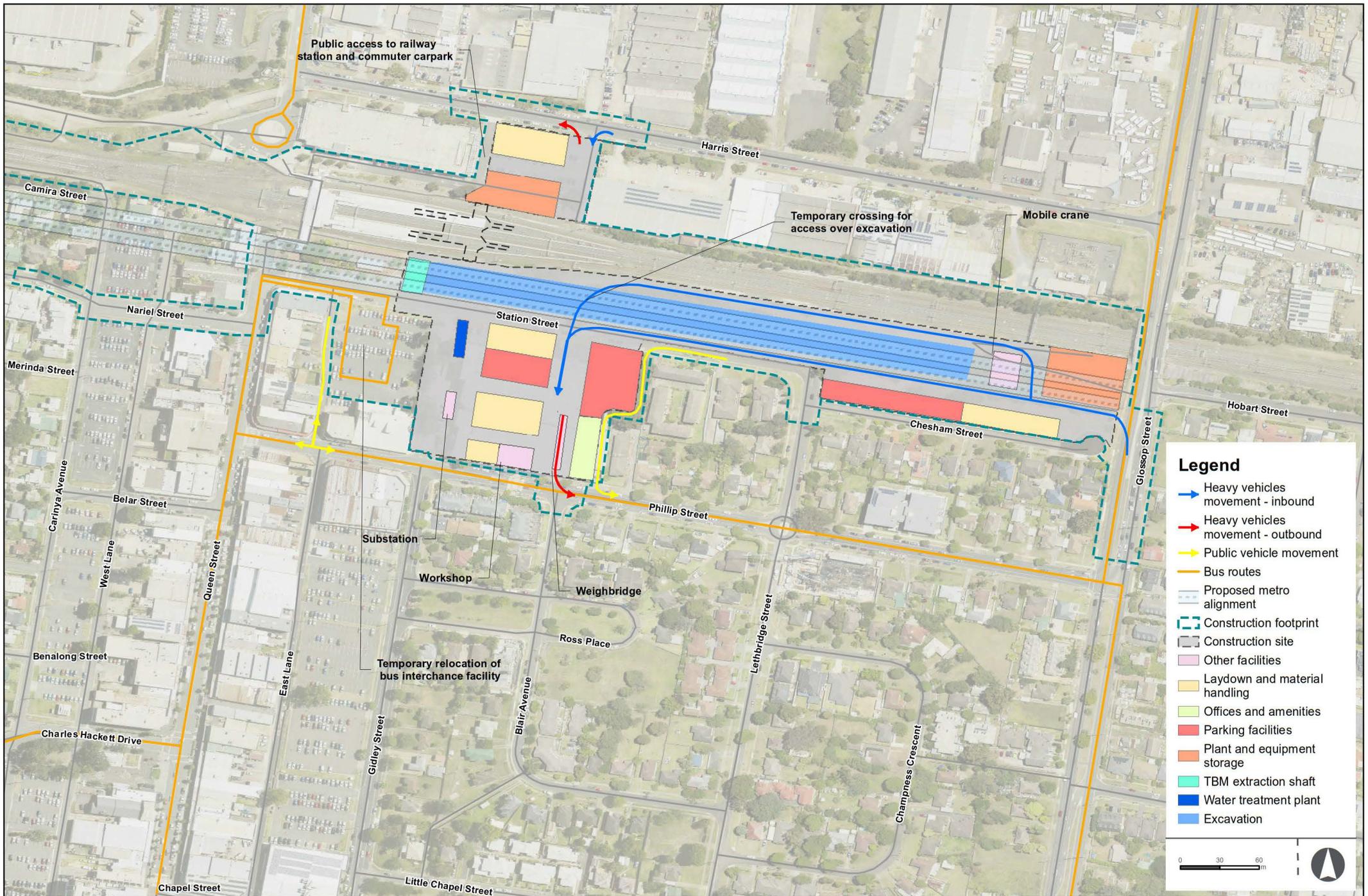
The project assessed in the Environmental Impact Statement included decommissioning and temporary relocation of the Station Street bus interchange and layover during construction of the metro station at St Marys. The Environmental Impact Statement proposed that the temporary bus interchange facility would be located at Nariel Street, west of Queen Street with temporary bus routes along Belar Street, West Lane, Carinya Avenue and Nariel Street (see Figure 8-38 of the Environmental Impact Statement). In Chapter 9 (Transport) of the Environmental Impact Statement the option of relocating the temporary bus interchange to Station Street/East Lane was noted as being subject to further investigation in consultation with relevant stakeholders.

Consultation with Penrith City Council has resulted in the confirmation that the temporary bus interchange facility would be relocated to the Station Street car park instead of Nariel Street. This change is consistent with the option that was identified in the Environmental Impact Statement for further investigation. The Station Street car park location would minimise potential parking impacts on Nariel Street and provide a better outcome for bus operators, local residents, and those wishing to access the station. The Station Street car park location would be closer to the existing St Marys Station, provide a more direct connection for commuters, and limit changes to bus routes in comparison to the Nariel Street location.

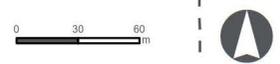
Bus movements inbound would travel north up Queen Street, turn right into Station Street and right into the new proposed temporary bus interchange (see Figure 6-1). There would be a new bus turnback (roundabout) constructed within the Station Street car park footprint for buses to make a u-turn and turn left out onto Station Street then left again to travel south along Queen Street. An option for some eastbound buses to exit the interchange via Gidley Street onto Phillip Street is also being investigated; these movements would be accommodated within the existing construction footprint and would have a similar impact along Philip Street as identified within the Environmental Impact Statement.

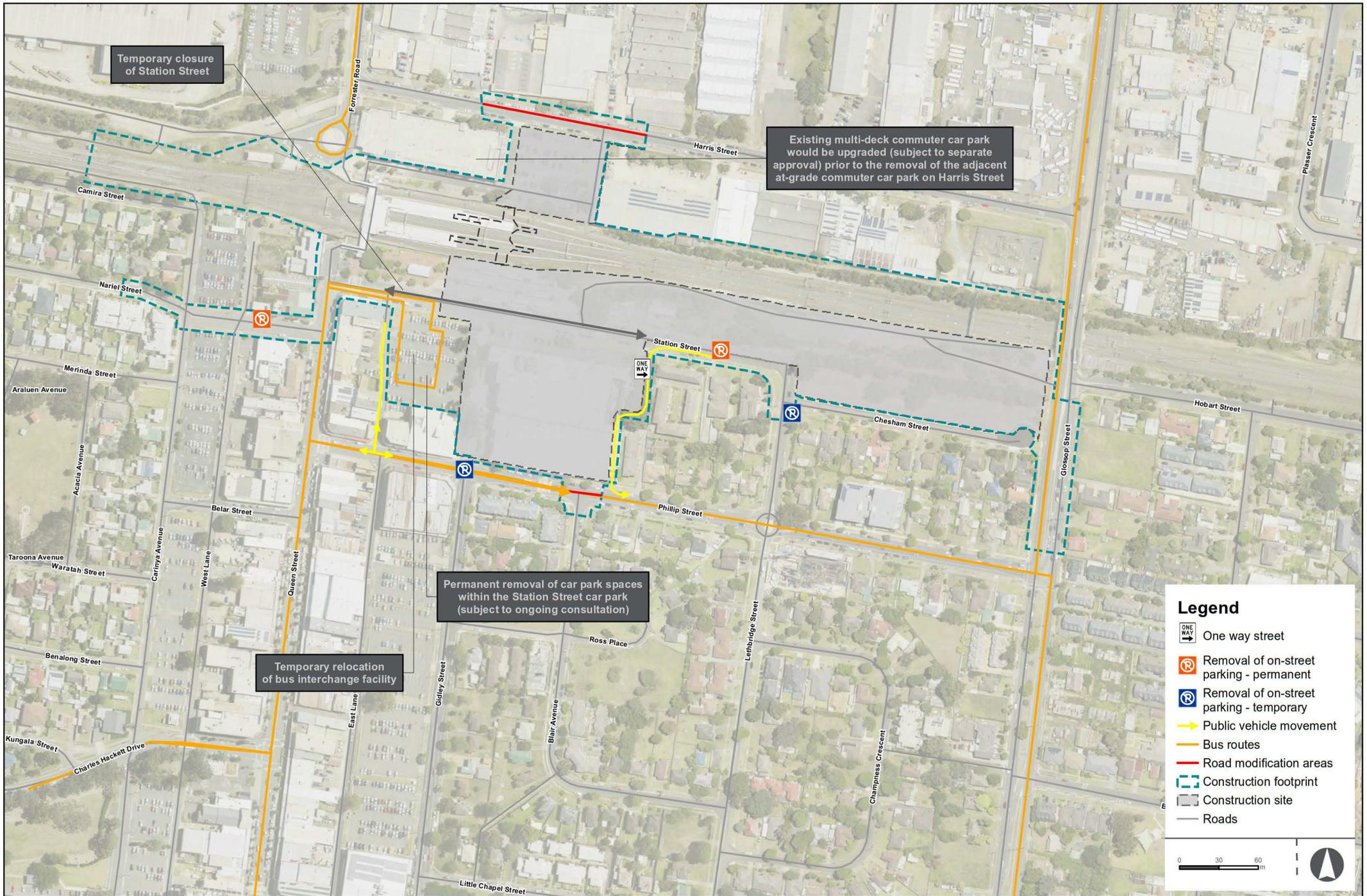
To limit interactions between buses and other vehicles during construction, point-to-point facilities would be relocated from Station Street to the northern end of Queen Street, within the current kiss and ride facility, and the kiss and ride facility would move to Nariel Street.

No other changes to access and traffic circulation are proposed as a result of moving the temporary bus interchange to Station Street.



- Legend**
- Heavy vehicles movement - inbound
 - Heavy vehicles movement - outbound
 - Public vehicle movement
 - Bus routes
 - Proposed metro alignment
 - Construction footprint
 - Construction site
 - Other facilities
 - Laydown and material handling
 - Offices and amenities
 - Parking facilities
 - Plant and equipment storage
 - TBM extraction shaft
 - Water treatment plant
 - Excavation





6.5.2 Assessment

An initial review of the potential impacts associated with this design change identified that the issues requiring additional assessment included:

- transport
- noise and vibration
- land use and property.

Transport impact assessment

The construction transport impacts resulting from the changes to the proposed temporary bus interchange at St Marys are provided below.

Parking impacts

The relocation of the bus facilities to the Station Street car park would no longer require the removal of on-street parking on Nariel Street, Carinya Avenue and West Lane, or the off-street parking at the Belar Street car park. This would result in temporary parking impacts being reduced by around 70 spaces during construction when compared to the impacts assessed in the Environmental Impact Statement. Up to 365 car parking spaces would be temporarily affected within the St Marys precinct and the road network immediately surrounding the station during the construction period.

Once the temporary bus interchange has been constructed, some car parking spaces may be able to be reinstated temporarily within the existing Station Street car park site, however this would be confirmed during design development and in consultation with Penrith City Council.

In addition, as outlined within the Environmental Impact Statement, the multi-level commuter car park on Harris Street would be extended to include two additional levels of parking (as outlined in Section 6.8.6) and is proposed to be in place prior to the removal of the at-grade commuter car park on Harris Street. These spaces would replace the commuter car parking spaces lost as a result of the construction of the project, with an overall increase of around 120 commuter parking spaces in the area.

The project would also affect other on-street and off street parking; however, as outlined in Section 9.5.1 of the Environment Impact Statement, the car parking survey undertaken by Sydney Metro in 2019 indicates there is existing on-street and off-street capacity within the town centre at St Marys (within 400 metres of affected spaces) to accommodate the loss of car parking spaces as a result of the project.

Public transport impacts

The existing bus interchange and layover on Station Street are proposed to be decommissioned and temporarily relocated to the existing Station Street car park, located south of Station Street. The existing access to the Station Street car park from East Lane via Phillip Street would be closed during construction. It is proposed that buses would access the relocated interchange facility from Station Street, with new bus turnback facilities in the form of a roundabout provided on site for buses to turn around and safely exit this facility onto Station Street and proceed towards Queen Street. An option for some eastbound buses to exit the interchange via Gidley Street onto Phillip Street is also being investigated; these movements would be accommodated within the proposed construction footprint.

The proposed arrangement eliminates the need to divert existing bus routes and therefore, is safer and more efficient when compared to the arrangement proposed in the Environmental Impact Statement.

Several pedestrian crossing would be provided for customers accessing St Marys Station, allowing pedestrians to safely cross Station Street to the relocated bus interchange facilities, and to safely cross Queen Street and Nariel Street to the relocated kiss and ride facilities. These crossings would be available once the temporary bus interchange is available.

The proposed relocation of the bus interchange would require customers to walk an additional distance of less than 50 metres compared to an additional distance of around 200 metres to the Nariel Street location proposed in the Environmental Impact Statement. This would constitute an improved outcome for public transport customers.

Access impacts

Access to St Marys Station and properties near the project would be maintained at all times and additional impacts are not anticipated as a result of the proposed change in the location of the temporary bus interchange.

Walking and cycling impacts

Pedestrian and cyclist access to St Marys Station would be maintained during the construction stage as described in the Environmental Impact Statement however some detours may be required during construction.

Point-to-point impacts

As noted in Section 4.2.7 of Technical Paper 1 – Transport, the point-to-point (including taxi) vehicle facility located on the southern side of Station Street (around 10 spaces) would be relocated to Nariel Street and the kiss and ride facilities located at St Marys Station, north of Station Street would be maintained during construction.

As a result of the relocation of the temporary bus interchange, the Environmental Impact Statement arrangement has changed slightly with the kiss and ride facilities moving to Nariel Street (around 10 spaces) during construction and the point-to-point vehicle facility relocated to St Marys Station, at the northern end of Queen Street. No additional impacts are caused by this change.

Noise and vibration impact assessment

The revised construction footprint is expected to result in reduced noise levels at sensitive receivers around Nariel Street, due to the increased distance between sensitive receivers and construction works.

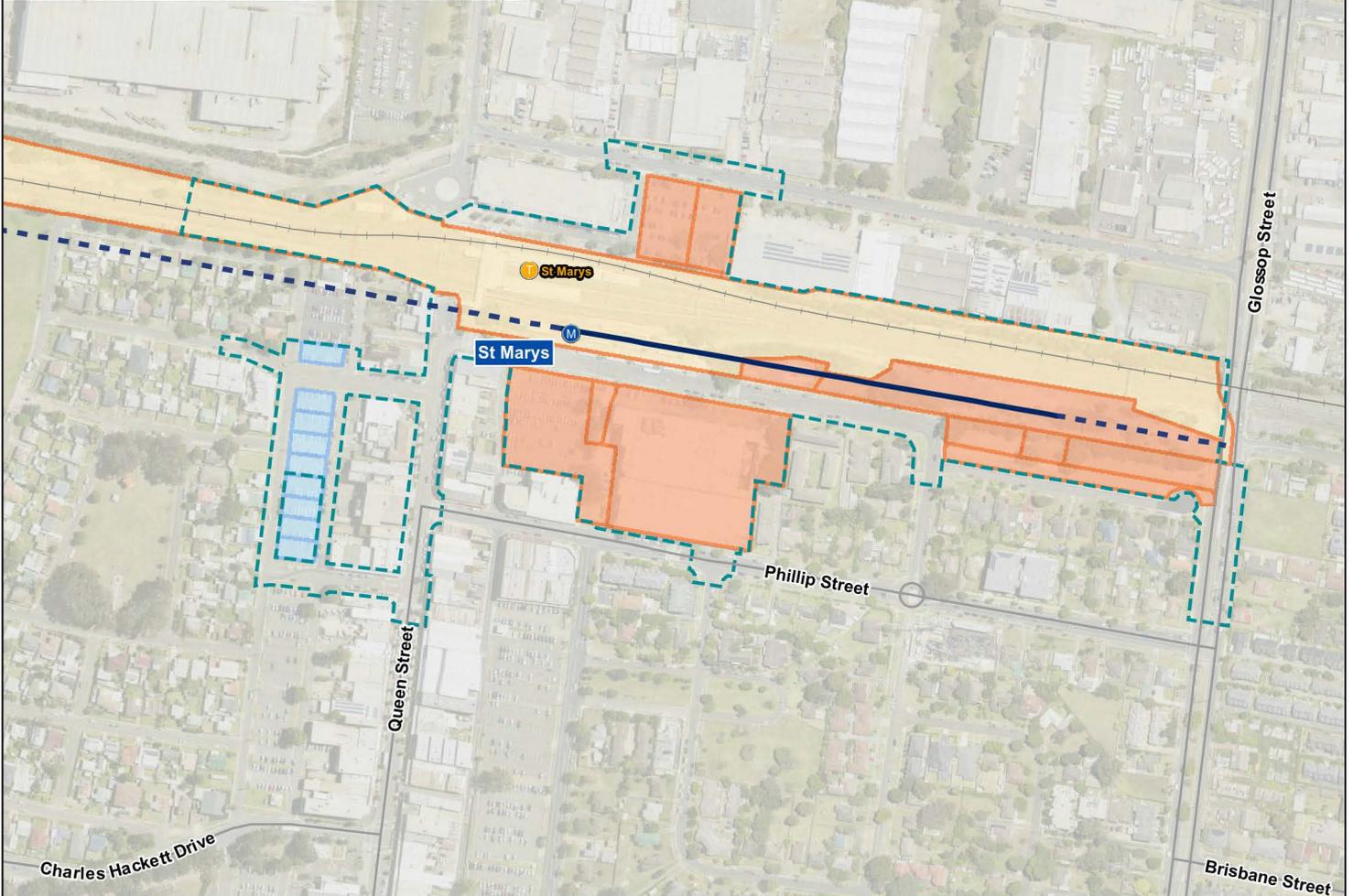
The relocation of the temporary bus interchange to Station Street is expected to have a negligible impact on predicted noise levels at sensitive receivers in the vicinity of Station Street for construction and bus movements. This area was already located within the project construction footprint and the closest residential receivers are located to the south. The bus movements along Station Street, generated by the temporary bus interchange, would not cause a perceptible increase in noise, noting that buses already use this section of Station Street.

Land use and property impact assessment

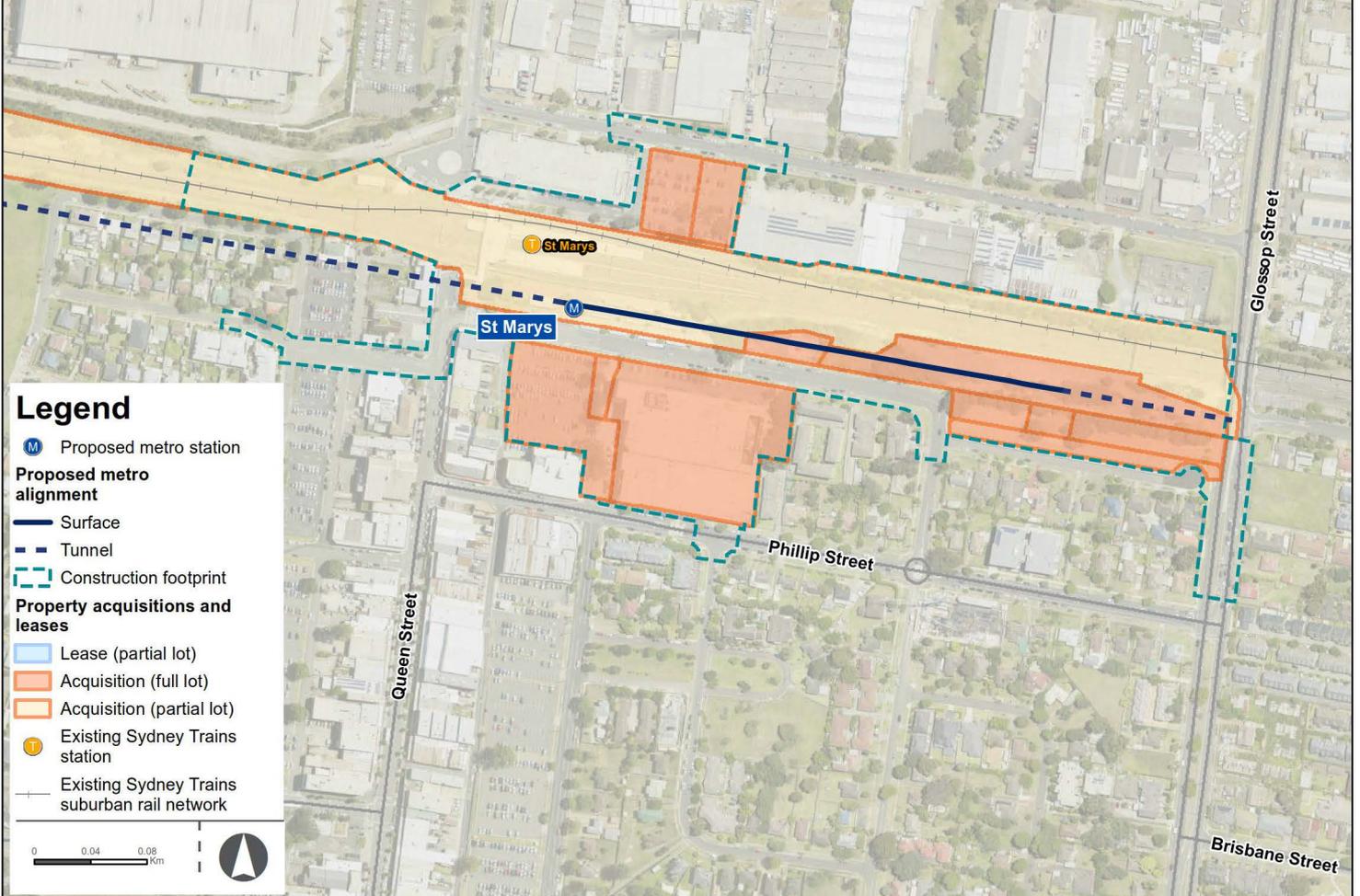
The proposed temporary bus interchange would be located on the Station Street car park site that was included as part of the construction footprint of the project (see Figure 8-11 of the Environmental Impact Statement). The proposed change would not result in additional land use and property impacts for the temporary bus interchange.

The proposed change would impact nine fewer properties than proposed in the Environmental Impact Statement. Land that was previously proposed to be leased for the temporary bus interchange would no longer be required (see Figure 6-3).

The project as per Environmental Impact Statement



The project as clarified in the Submissions Report



6.5.3 Changes to or additional mitigation measures

This assessment has resulted in one revision to mitigation measure T7 as described in Table 7-2 to recognise the proposed change in the location of the temporary bus interchange to the Station Street car park in St Marys.

6.6 Construction footprint south of Patons Lane

6.6.1 Description

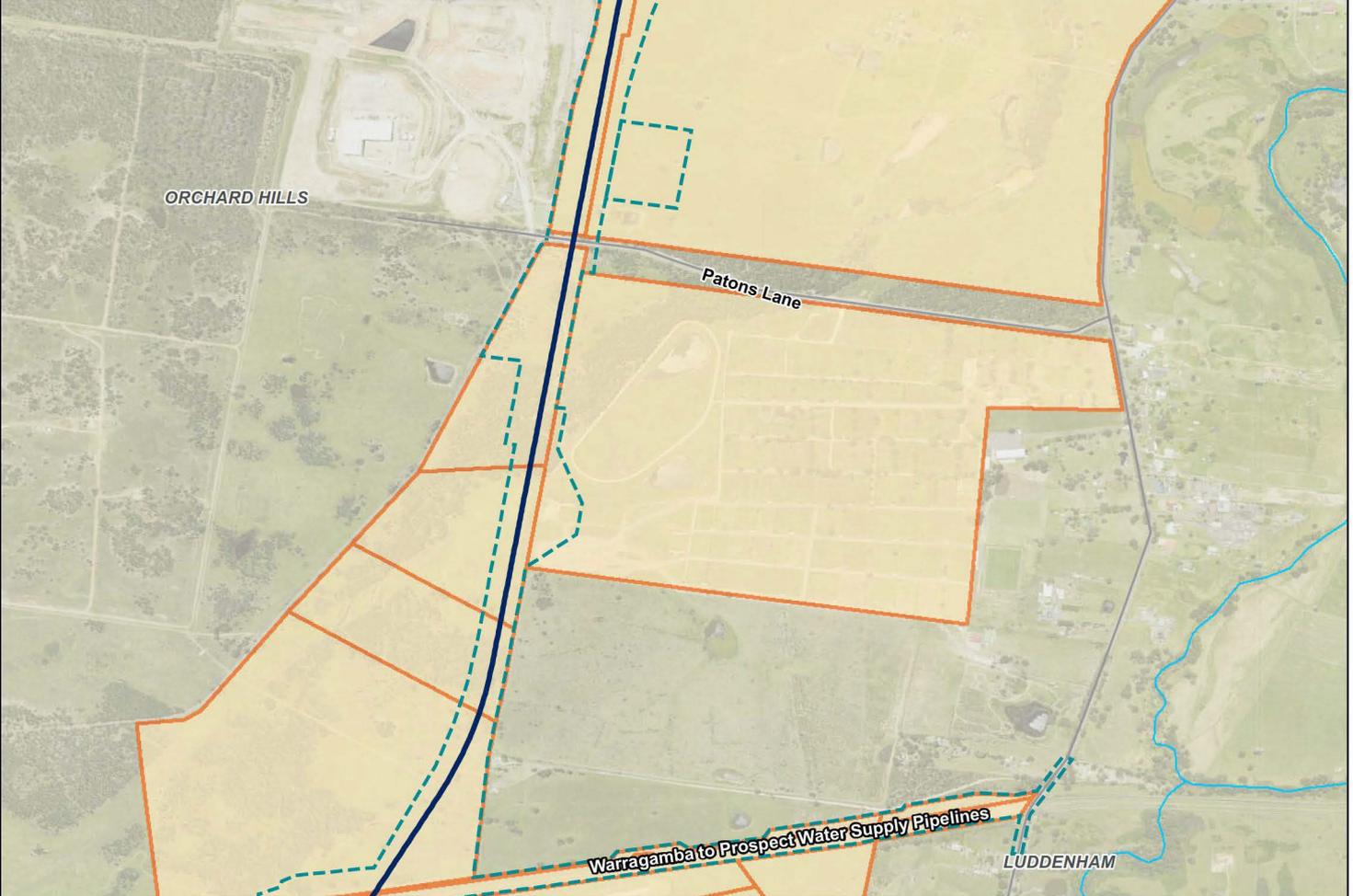
As a result of design development, land required for the construction footprint in the area to the south of Patons Lane as shown in Figure 19-10b of the Environmental Impact Statement has been reduced.

6.6.2 Assessment

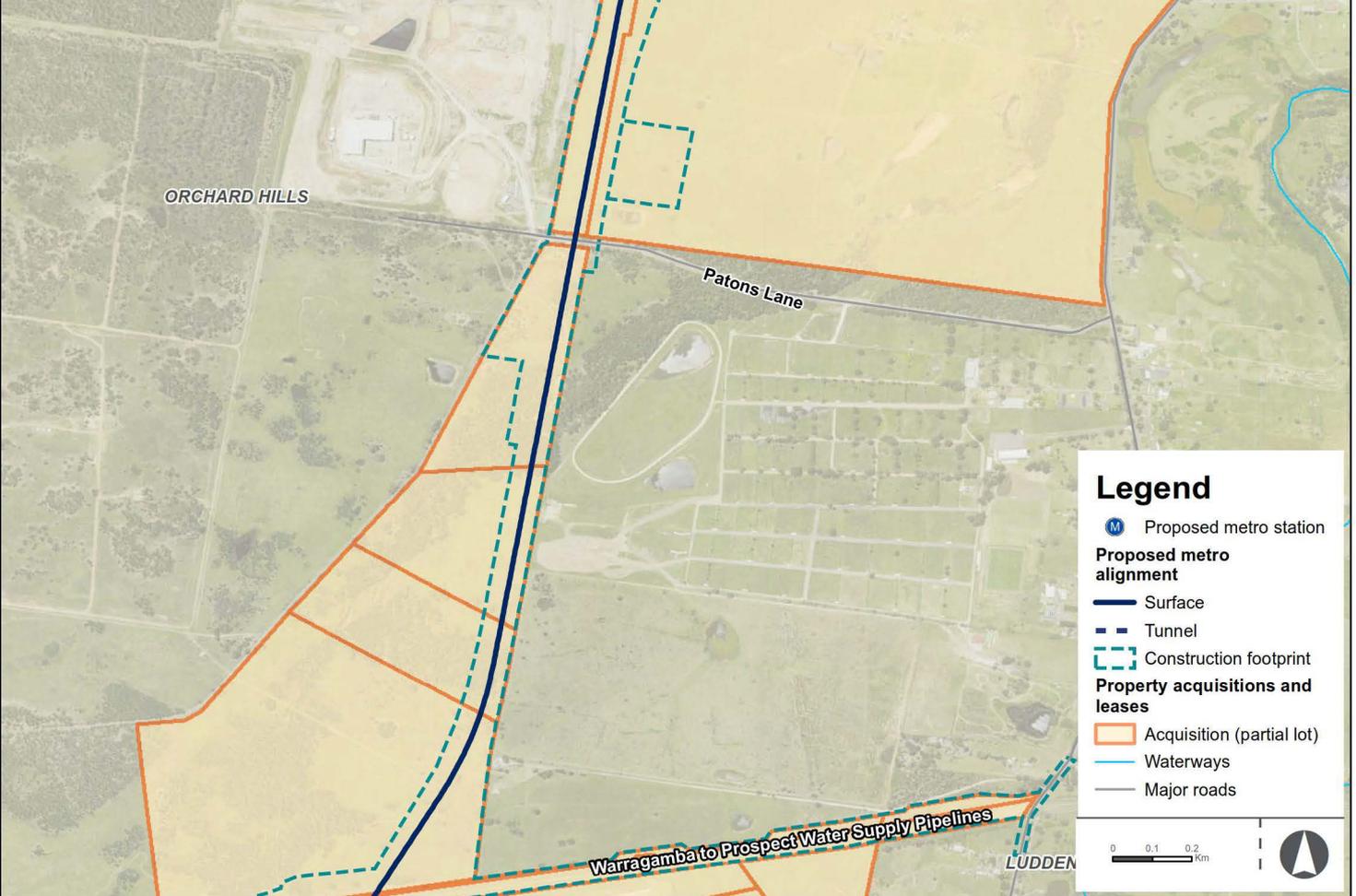
One rural residential property (Lot 1 DP 1099147) would be removed from the construction footprint resulting in a reduction of one partial property acquisition compared to the Environmental Impact Statement. This is a revised total of 32 partial property acquisitions compared to 33 partial property acquisitions in the Environmental Impact Statement. Changes to the construction footprint and property acquisition are shown in Figure 6-4.

The change in footprint has resulted in a slight reduction of native vegetation clearing which has been documented in the Revised Biodiversity Development Assessment Report (Appendix G). No other additional assessment was required in relation to this change.

The project as per Environmental Impact Statement



The project as clarified in the Submissions Report



Legend

- M Proposed metro station
- Proposed metro alignment**
- Surface
- - - Tunnel
- - - Construction footprint
- Property acquisitions and leases**
- Acquisition (partial lot)
- Waterways
- Major roads



6.7 Aerotropolis Core Station

6.7.1 Description

Construction site layout

Section 8.7.13 of the Environmental Impact Statement states the Aerotropolis Core construction site would be located to the east of Badgerys Creek Road. The existing site consists of partially cleared land. A range of construction activities would be carried out at the site to support TBM retrieval, cut-and cover station construction and mined excavation of the stub tunnel.

As a result of design development and construction planning and to allow greater flexibility in use of the site during construction, the proposed construction footprint has changed. The proposed change, as shown in Figure 6-5, includes:

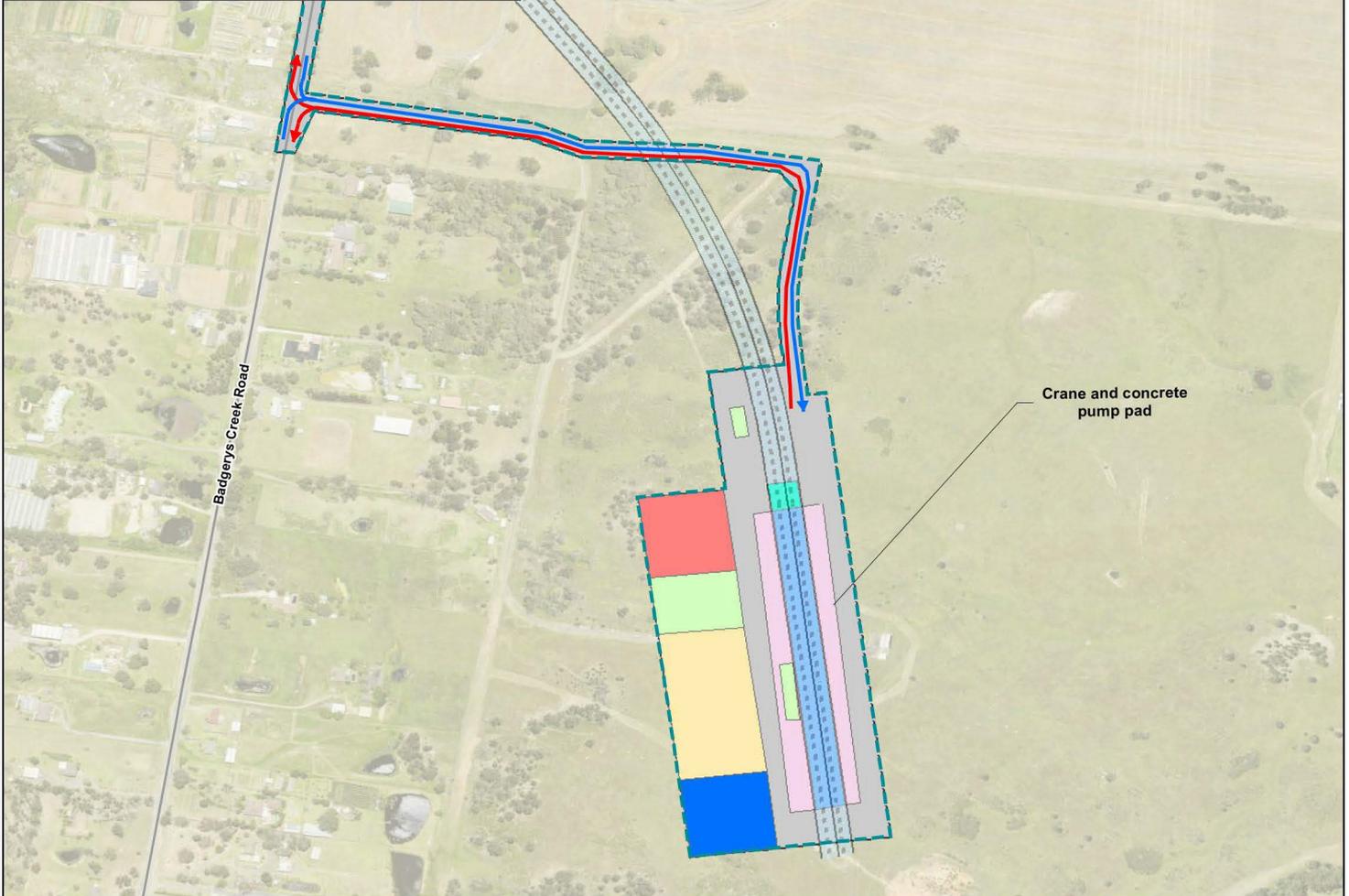
- a revised construction footprint that retains some of the footprint proposed in the Environmental Impact Statement and extends this predominantly to the east
- realignment of a section of the construction access road connecting the construction site to Badgerys Creek Road to minimise impact on mature trees. This road may form part of the wider road network for Aerotropolis Core precinct (the area to be called Bradfield) and is subject to further design development, construction planning and ongoing consultation with the Western Parkland City Authority
- inclusion of the proposed permanent access road within the construction footprint. This access road runs parallel to and immediately west of the rail alignment
- change to the indicative construction site layout as shown on Figure 8-36 of the Environmental Impact Statement. This revised layout is indicative only and would be subject to further design development, construction planning and ongoing consultation with the Western Parkland City Authority.

These changes have been informed through ongoing consultation with the Western Parkland City Authority and would help facilitate movement of materials and equipment during construction as well as minimise conflicts between the delivery programs of the broader Aerotropolis precinct works and the Sydney Metro – Western Sydney Airport project.

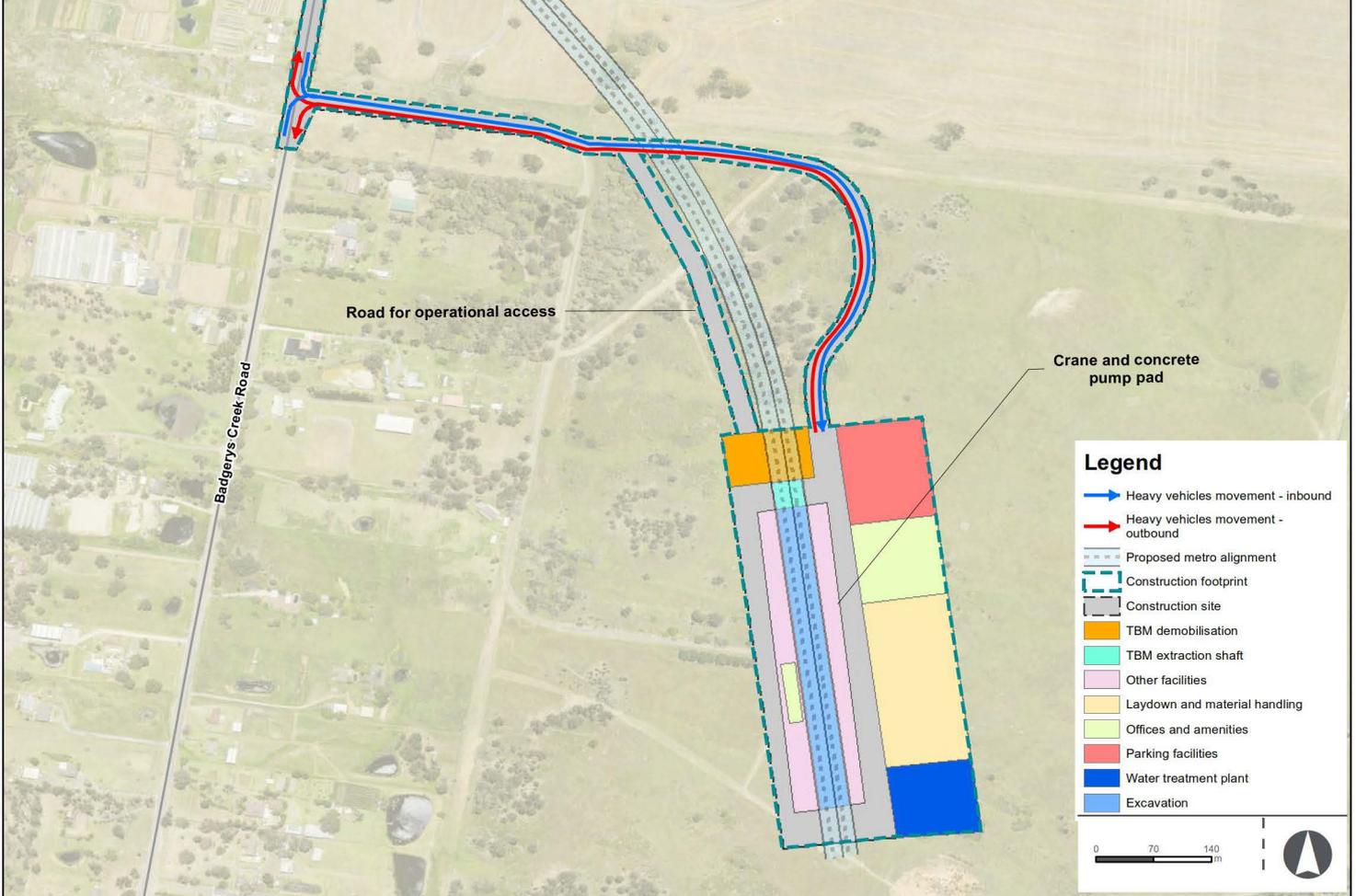
There is no change proposed to the construction activities to be undertaken at the site as described in Section 8.7.13 of the Environmental Impact Statement, which comprise:

- construction of the new station box, station structures and finishes
- construction of the crossover
- construction of stub tunnels
- spoil handling, storage and transport
- temporary TBM retrieval shaft excavation
- TBM retrieval
- station precinct works
- access road connection to Badgerys Creek Road including provision of turning lanes to provide access to the construction site.

The project as per Environmental Impact Statement



The project as clarified in the Submissions Report



Legend

- Heavy vehicles movement - inbound
- Heavy vehicles movement - outbound
- Proposed metro alignment
- Construction footprint
- Construction site
- TBM demobilisation
- TBM extraction shaft
- Other facilities
- Laydown and material handling
- Offices and amenities
- Parking facilities
- Water treatment plant
- Excavation

0 70 140 m

Aerotropolis Core indicative construction site layout - proposed changes

Figure 6-5

Indicative only, subject to design development

Station precinct layout

Section 7.4.6 of the Environmental Impact Statement states the Aerotropolis Core Station is proposed to be integrated with the future Aerotropolis Core precinct (the area to be called Bradfield). Under *State Environmental Planning Policy (Western Sydney Aerotropolis) 2020*, the Western Parkland City Authority is preparing a master plan for the Aerotropolis Core precinct which will guide development on the site and detail the public domain and development interface with the station buildings.

The station would consist of an underground structure (cut-and-cover station typology). The metro station would provide an island platform configuration in a generally north–south orientation. The station would be divided into three main levels. The proposed Aerotropolis Core Station precinct and interchange would include the following elements:

- secure bicycle parking
- transport interchange facilities including bus bays and associated shelters as well as bus layover facilities accessed from a bus-only street
- kiss-and-ride bays and point-to-point vehicle facilities
- temporary surface park-and-ride facility with up to around 300 spaces, located within the space provisioned for potential future rail corridors. The spaces would be relocated or removed in the future as required to accommodate the introduction of the potential future rail corridors and to realise the future preferred access outcomes for the Aerotropolis, in line with its role as the centre of the Western Parkland City
- construction of new road carriageways to connect the wider precinct including new pedestrian crossings and creation of a new public plaza/urban domain adjacent to the proposed station entrance
- built elements to allow for potential future station retail and other station activation opportunities (fit out and use of retail spaces would be subject to separate approval, where required).

Final location of these elements would be guided by the Western Parkland City Authority Master Plan and through ongoing consultation with the Western Parkland City Authority.

An indicative layout of the Aerotropolis Core Station as proposed in the Environmental Impact Statement is shown in Figure 6-6.

The proposed change, as also shown in Figure 6-6, includes:

- construction of an additional road for operational access to the Aerotropolis Core Station, subject to ongoing design development and consultation with the Western Parkland City Authority
- revised location of the indicative operational layout and key design elements. This revised layout retains the same elements as assessed within the Environmental Impact Statement. The revised layout is indicative only and would be subject to further design development and consultation with the Western Parkland City Authority to ensure integration with the Western Parkland City Authority master plan for the site.

Sydney Metro would continue to consult with relevant key stakeholders and affected landowners during detailed design of the stations, interchanges and precincts. A new mitigation measure (OLU2) commits to this consultation being undertaken.



Figure 6-6 Aerotropolis Core Station - Indicative layout and key design elements
Note: Indicative only, subject to design development.

Figure 6-6 Aerotropolis Core indicative layout and key design elements

6.7.2 Assessment

An initial review of the potential impacts associated with this design change identified that the issues requiring additional assessment included:

- noise and vibration
- flooding, hydrology and water quality
- soil and contamination.

Construction noise and vibration impacts

The construction footprint at the Aerotropolis Core has been revised compared to what was assessed in the Environmental Impact Statement, which has resulted in a reduced distance between the construction site and nearby residential receivers along Kelvin Park Drive and The Retreat. There is no change to the separation distance between the construction site and nearby residential receivers along Badgerys Creek Road. These noise sensitive receivers may be exposed to slightly higher noise levels than predicted in Technical Paper 2 – Noise and Vibration. The reduced distance between the construction footprint and the residential receivers may increase predicted $LA_{eq,15min}$ noise levels by up to 0.6 dB. As above ground works are not expected to occur outside standard hours at this site, no increase to out-of-hours noise levels are predicted due to the revised construction footprint.

The predicted NML exceedances within NCA12, considering the revised construction footprint, are presented in Table 6-1. Numbers in brackets represent worst case construction scenarios. No additional noise sensitive receivers experience exceedances of NMLs. The values presented in the table represent the number of receivers impacted during typical construction scenarios, with the values in brackets representing the number of exceedances during worst case construction scenarios. No additional noise sensitive receivers experience exceedances of NMLs.

Table 6-1 NCA12 – overview of NML exceedances at residential receivers – typical and (worst case)

Activity	Highly noise affected	Number of receivers exceeding NML – typical and (worst case)		
		Standard hours		
		0-10 dB	10-20 dB	20+ dB
SC01 - Enabling works	0 (1)	223 (101)	109 (239)	1 (29)
SC02 - Tunnelling and associated works	0 (0)	77 (45)	19 (69)	0 (6)
SC03 - Bridge and viaduct construction	0 (0)	N/A	N/A	N/A
SC04 - Earthworks and excavation	0 (9)	75 (31)	272 (179)	23 (173)
SC05 - Station construction	0 (0)	219 (58)	97 (246)	0 (41)
SC06 - Construction of stabling and maintenance and other ancillary facilities	0 (0)	N/A	N/A	N/A
SC07 - Rail systems fitout	0 (0)	N/A	N/A	N/A
SC08 - Station fitout, precinct and transport integration works	0 (2)	205 (50)	143 (262)	2 (61)
SC09 - Finishing works	0 (0)	114 (262)	1 (62)	N/A

Table 6-2 outlines predicted changes in the number of NML exceedances at residential receivers comparing the Environmental Impact Statement and the proposed design change. Where negative numbers are presented, it indicates that receivers have shifted from a lower exceedance band to a higher exceedance band (e.g. a receiver that was experiencing an exceedance of 0-10dB now experiences an exceedance of 10-20dB). No additional noise sensitive receivers experience exceedances of NMLs. The values presented represent the shift in number of receivers impacted during typical construction scenarios, with the values in brackets representing the shift in number of exceedances during worst case construction scenarios.

Table 6-2 NCA12 – changes in NML exceedances at residential receivers from Environmental Impact Statement – typical and (worst case)

Activity	Change in number of receivers exceeding NML – typical and (worst case)		
	Standard hours		
	0-10	10-20	20+
SC01 - Enabling works	-4 (0)	+4 (-2)	0 (+2)
SC02 - Tunnelling and associated works	0 (0)	0 (0)	0 (0)
SC03 - Bridge and viaduct construction	N/A	N/A	N/A
SC04 - Earthworks and excavation	0 (0)	-1 (0)	+1 (0)
SC05 - Station construction	-1 (-1)	+1 (-2)	0 (+3)
SC06 - Construction of stabling and maintenance and other ancillary facilities	N/A	N/A	N/A
SC07 - Rail systems fitout	0 (0)	0 (0)	0 (0)
SC08 - Station fitout, precinct and transport integration works	-1 (-1)	+1 (-2)	0 (+3)
SC09 - Finishing works	0 (-1)	0 (+1)	0 (0)

Environmental management and mitigation measures are outlined in Chapter 7 (Revised performance outcomes and mitigation measures). The revised construction footprint at the Aerotropolis Core would be managed under the existing environmental management or mitigation measures and would not require any additional measures.

Construction flooding, hydrology and water quality impacts

Detail on potential temporary flooding impacts during construction including flooding figures is provided in Chapter 14 (Flooding, hydrology and water quality) of the Environmental Impact Statement and Section 5.1.1 and Appendix D of Technical Paper 6 – Flooding, hydrology and water quality.

The Aerotropolis Core construction footprint is largely outside the extent of the 5 per cent AEP, however the revised construction footprint to the east encroaches slightly further on the Thompsons Creek tributary flood extent at the north-eastern area of the footprint.

Potential flood impacts caused by construction and/or impacts of flood events to construction activities are expected to be minimal. Revision of the footprint would not lead to additional construction phase flood impacts. Any flood impact would be temporary and would be managed through flood sensitive construction planning as identified in Chapter 14 (Flooding, hydrology and water quality) of the Environmental Impact Statement.

Construction planning would consider flood related mitigation including staging, monitoring, consultation, flood-proofing of excavations and review of site layout and staging of construction works (refer to mitigation measure HYD1).

There is no change proposed to the construction activities to be undertaken at this site and hence no additional sources of pollutants to impact water quality from what was assessed within the Environmental Impact Statement. The revised Aerotropolis Core construction footprint would change the area of disturbed and exposed soil, however this would be appropriately managed in the surface water quality monitoring program (mitigation measure WQ1). Performance outcomes for flooding, hydrology and water quality for the project are listed in Table 14-8 of the Environmental Impact Statement. In addition, the Construction Environmental Management Framework (Appendix E) lists the requirements to be addressed by the construction contractor in developing the Construction Environmental Management Plans that would include the Soil and Water Construction Environmental Management Plan.

Construction soil and contamination impacts

The revised construction footprint includes part of the former Overseas Telecommunications Radio Station compound which comprised former fuel/oil and chemical storage and potential use of hazardous building materials. This part of the construction footprint is assessed as high risk as per AEC 47. The remainder of the construction footprint including the revised footprint forms part of AEC 46 which is assessed as medium risk (see Figure 6-7). AEC 46 included areas of disturbed ground and unidentified items related to the historical use as the Overseas Telecommunications Radio Station.

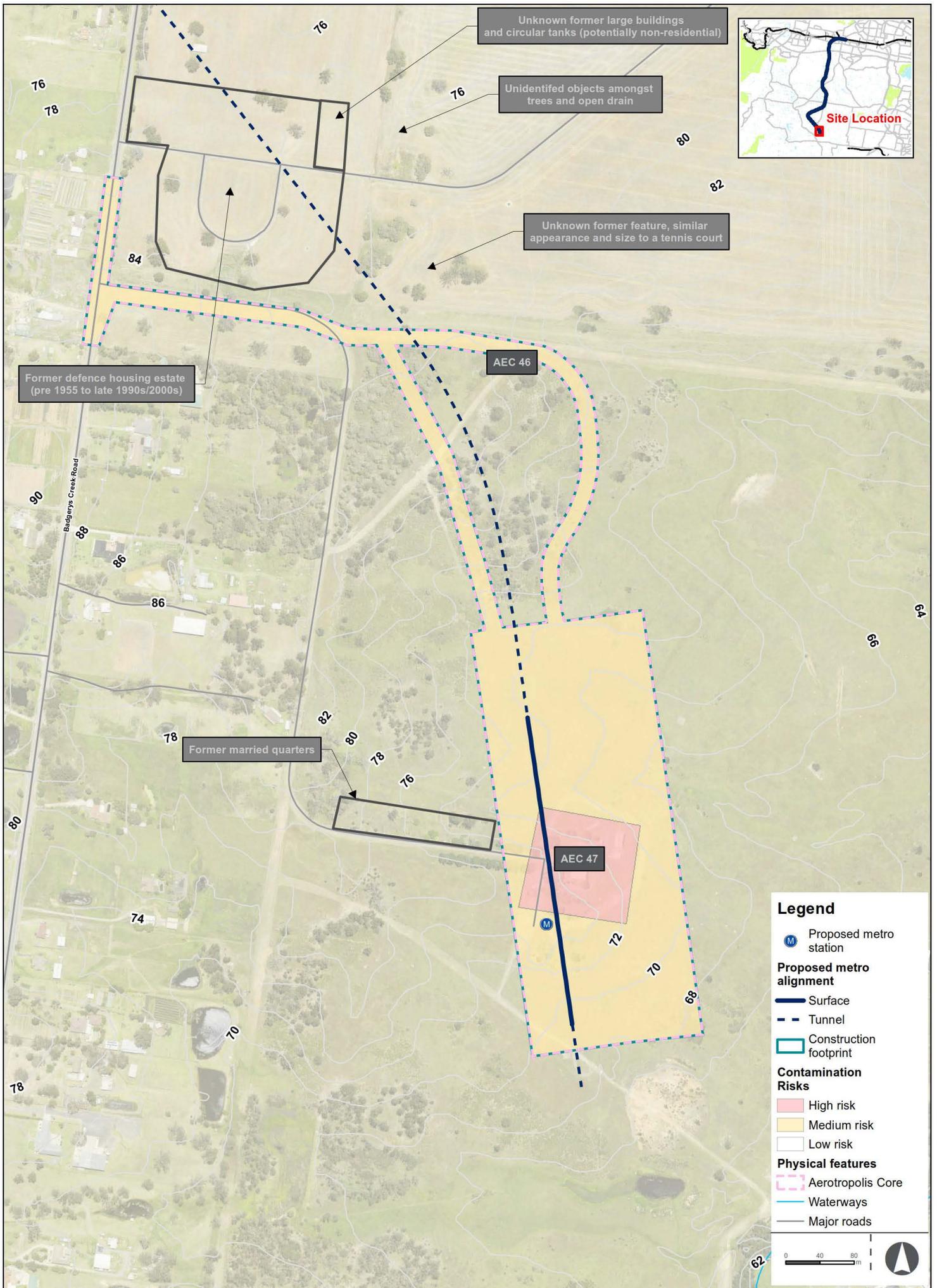
The revised construction footprint is an area mapped as moderate risk for soil salinity based on the Department of Infrastructure Planning and Natural Resources (2002) Salinity Potential in Western Sydney Map that is consistent with the Environmental Impact Statement.

The revised Aerotropolis Core construction footprint would change the area of disturbed and exposed soil, however this would be appropriately managed in the Soil and Water Management Plan (mitigation measure SC1) and detailed site investigation (if required) (mitigation measure SC3). Performance outcomes for soils and contamination are listed in Chapter 7 (Revised performance outcomes and mitigation measures) and require that:

- contamination risks to human health and ecological receivers are minimised through effective management of existing contaminated land
- contaminated land and soil within the footprint of the project is remediated where required, to ensure the land is suitable for the intended future land use.

6.7.3 Changes to or additional mitigation measures

A new mitigation measure (OLU2) is proposed in Table 7-2 to ensure that Sydney Metro would continue to consult with key stakeholders and affected landowners during design development of the station interchanges and precincts.



Unknown former large buildings and circular tanks (potentially non-residential)

Unidentified objects amongst trees and open drain

Unknown former feature, similar appearance and size to a tennis court

Former defence housing estate (pre 1955 to late 1990s/2000s)

Former married quarters

AEC 46

AEC 47

Legend

Proposed metro station

Proposed metro alignment

Surface

Tunnel

Construction footprint

Contamination Risks

High risk

Medium risk

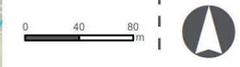
Low risk

Physical features

Aerotropolis Core

Waterways

Major roads



Aerotropolis Core construction site and driven tunnel alignment contamination sources and risk ranking

Figure 6-7

Indicative only, subject to design development

6.8 Additional assessments since exhibition of the Environmental Impact Statement

Chapter 11 (Biodiversity), Chapter 12 (Non-Aboriginal heritage) and Chapter 13 (Aboriginal heritage) of the Environmental Impact Statement identified that additional field survey and assessment would need to be undertaken. Additional field survey and assessment has occurred since the Environmental Impact Statement was finalised for exhibition.

6.8.1 Biodiversity assessment

An assessment of potential impacts of the project on biodiversity was provided in Chapter 11 (Biodiversity) of the Environmental Impact Statement and Technical Paper 3 - Biodiversity Development Assessment Report. These assessments indicated that additional biodiversity field surveys would be carried out after exhibition of the Environmental Impact Statement and documented in the Submissions Report.

The Revised Biodiversity Development Assessment Report (Appendix G) has incorporated the following:

- results of targeted field surveys in Spring 2020 for threatened species with seasonal requirements
- consideration of potential impacts associated with design changes proposed for the project south of Patons Lane and the potential additional permanent spoil placement area on-airport
- changes to cumulative impacts arising from amendments to the future M12 Motorway project.

A summary of potential native vegetation impacts of the project is provided in Table 6-3 and is a reduction in impact to native vegetation compared to the Environmental Impact Statement. Direct impacts to native vegetation are caused by clearing and indirect impacts relate to the potential impacts from groundwater drawdown. Table 6-3 shows that there is a slight reduction in the total area of native vegetation to be removed within the off-airport area of the project by comparison to the Environmental Impact Statement. This is a result of a reduction of the construction footprint in the area to the south of Patons Lane (as described in Section 6.6).

Table 6-3 Summary of potential native vegetation impacts shown in hectares

Location	Environmental Impact Statement			Revised BDAR		
	Direct impacts (Ha)	Indirect impacts (Ha)	Total area impacted (Ha)	Direct impacts (Ha)	Indirect impacts (Ha)	Total area impacted (Ha)
Off-airport	31.64	1.79	33.43	29.86	1.81	31.67

A summary of biodiversity offset obligations is provided in Table 6-4. This obligation may be refined through development of the design and construction planning

Table 6-4 Summary of biodiversity offset obligations

Location	Environmental Impact Statement		Revised BDAR	
	Ecosystem credits	Species credits	Ecosystem credits	Species credits
Off-airport	895	2,998	848	1,113

As identified in the Revised Biodiversity Development Assessment Report, the final quantification of and delivery of offset liability in accordance with BAM would be determined based on a vegetation clearing report and delivered within 12 months of the final design and construction plan. During design development for the project the biodiversity impacts, offset obligations and credit calculations would be reviewed, and if necessary updated.

The Revised Biodiversity Development Assessment Report has confirmed that following the additional surveys there has been an overall reduction in the project's impacts to threatened species previously assumed to be present within the off-airport areas as the assumed area and credit liability has been reduced following targeted survey. For those remaining areas, which were still not able to be surveyed due to limited access to private properties, a conservative approach has been maintained with species assumed to be present based on available habitat. The off-airport components of the project would result in the following impacts:

- residual impact on 31.67 hectares of native vegetation (29.86 hectares direct impact and 1.81 hectares of indirect impact) that is consistent with the following TECs under the BC Act:
 - Cumberland Plain Woodland in the Sydney Basin Bioregion – critically endangered
 - River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions – endangered
 - Shale Gravel Transition Forest in the Sydney Basin Bioregion – endangered
 - Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions – endangered
- of these, two TECs meet the criteria for listing under the EPBC Act:
 - Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community
 - Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest
- two threatened flora species, *Grevillea juniperina* subsp. *juniperina* and *Dillwynia tenuifolia* (*Dillwynia tenuifolia* was not identified in the Environmental Impact Statement), listed as vulnerable under the BC Act were recorded within the study area during project field surveys. The total combined area of habitat for *Grevillea juniperina* subsp. *juniperina* within the study area has been estimated to be about 6.38 hectares (compared to 21.44 hectares in the Environmental Impact Statement). A total of 100 individuals of *Dillwynia tenuifolia* were recorded. The total combined area of habitat for *Dillwynia tenuifolia* within the study area has been estimated to be about 3.05 hectares
- a total of 15 threatened flora species were considered to have a moderate or higher likelihood of occurrence within the off-airport study area. Due to limited access to private residential properties for project field surveys, a conservative assessment has been applied and 12 threatened flora species have been assumed present based on presence of associated habitat. These species are considered affected by the project and species credits have been assigned for offsetting purposes (this is consistent with the Environmental Impact Statement)
- a total of 47 threatened fauna species were considered to have a moderate or higher likelihood of occurrence within the off-airport study area and, following survey and assessment, 18 fauna species (compared to 17 fauna species in the Environmental Impact Statement) have been assigned to ecosystem credit species calculations for offsetting purposes
- two threatened fauna species (Cumberland Plain Land Snail and Southern Myotis) were recorded or have been assumed present within the off-airport study area and have been assigned to species credit calculations for offsetting purposes (the Environmental Impact Statement assumed presence for Little Eagle and additional field surveys confirmed it was not present)
- no threatened fish species listed under *the Fisheries Management Act 1994* or EPBC Act were recorded or considered likely to occur within the study area and as such the project is unlikely to significantly impact any threatened aquatic species or their habitats (this is consistent with the Environmental Impact Statement).

The EPBC Act Final Environmental Impact Assessment of on-airport proposed action (2019/8541) provides an assessment of the project's impact on biodiversity within Western Sydney International.

6.8.2 Non-Aboriginal heritage assessment

Chapter 12 (Non-Aboriginal heritage) of the Environmental Impact Statement and Technical Paper 4 – Non-Aboriginal heritage assess the potential impacts during construction and operation of the project. Due to limited access being available to some private properties, further inspections were proposed following finalisation of the Environmental Impact Statement for public exhibition.

Additional inspections and assessment have occurred as described below:

- additional site inspections to heritage listed and potential heritage items identified during the preparation of the Environmental Impact Statement for which property access was not initially available

- re-assessment of heritage significance for heritage items which were inspected, including an assessment against relevant Conservation Management Plan policies where required
- the preparation of a non-Aboriginal Archaeological Research Design (Appendix K) for managing potential significant archaeological remains.

Kennett's Airfield

Table 12-5 of the Environmental Impact Statement identified Kennett's Airfield as an item of potential local significance. A site inspection of the property was undertaken to identify and assess any significant heritage fabric at the site and confirm its heritage significance. During the site inspection, examination of existing airfield structures (particularly aircraft hangars, signal lighting and stored aviation equipment) showed that material at the site had been renovated and updated from the late 1990s to the present day. Earlier remnant fabric, which may have been demonstrative of the post-war pastoral aviation facility, no longer remained.

A revised significance assessment of the site has been prepared and is presented in Table 6-5. Based on this assessment, the potential heritage item has been determined to not reach the threshold for local heritage significance.

Table 6-5 Assessment of significance for Kennett's Airfield

Criterion	Discussion
A) Historical	<p>Kennett's Airfield is associated with the post-war private commercial aviation in Western Sydney. However, the Kennett's Airfield location has moved in its history, with the present location established from the 1960s onwards.</p> <p>Kennett's Airfield does not reach the threshold of local significance under this criterion.</p>
B) Associative	<p>Although the Kennett family are a known farming family within the local area, their association with the property would not be considered notable enough for significance under this criterion.</p> <p>Kennett's Airfield does not reach the threshold of local significance under this criterion.</p>
C) Aesthetic/ Technical	<p>Kennett's Airfield may provide technical evidence of post-war private airfields. The site may contain remnant amateur aviation materials.</p> <p>Following the completion of the site inspection, it was determined that existing fabric at the site consists of newly constructed (ca. 1990s) hangars with limited modern aviation equipment. These elements are not considered demonstrative of or unique to the small-scale post-war aviation industry.</p> <p>Kennett's Airfield does not reach the threshold of local significance under this criterion.</p>
D) Social	<p>Kennett's Airfield was the location of fly-in events with historic aircraft and may be of social significance to amateur aviation groups and the Luddenham local community who attended these events.</p> <p>Following completion of the site inspection, no remnant evidence of former fly events or community activities were present on the site due to the renovation of the airfield throughout the late 20th century.</p> <p>Kennett's Airfield does not reach the threshold of local significance under this criterion.</p>

Criterion	Discussion
E) Research Potential	<p>The heritage item in conjunction with community research may provide more about the history of the Kennett's Airfield and the role the airstrip may have played in supporting agricultural operations in the Luddenham and wider Western Sydney area throughout the later 20th century.</p> <p>Following the site inspection, with no earlier remnant fabric remaining at the airstrip, little information could be derived from any earlier phase of the site's use.</p> <p>Kennett's Airfield does not reach the threshold of local significance under this criterion.</p>
F) Rarity	<p>Kennett's Airfield is the only remaining and historically known privately owned and operated pastoral airstrip in the Penrith LGA and the Western Sydney region.</p> <p>Following the site inspection, it was identified that remnant fabric at the site dates from the 1990s and later, with earlier structures and equipment having been renovated. These newer materials are not considered to be demonstrative of the original post-war pastoral airstrip.</p> <p>Kennett's Airfield does not reach the threshold of local significance under this criterion.</p>
G) Representativeness	<p>Kennett's Airfield is a good and intact example of a private pastoral airstrip in the Penrith LGA. However, the current airstrip has been renovated for use throughout the late 20th and early 21st centuries and is not demonstrative of its post-war pastoral use.</p> <p>Kennett's Airfield does not reach the threshold of local significance under this criterion.</p>

Kelvin

Kelvin is listed on the State Heritage Register. The State Heritage listed curtilage comprises the main property whereas the LEP curtilage comprises the main property and former driveway connection to Badgerys Creek Road. Part of the LEP curtilage (former driveway) is located within a small part of the construction footprint.

Access was provided to the site and it was inspected following exhibition of the Environmental Impact Statement to assess the integrity of view-lines from the heritage item towards the proposed Aerotropolis Core construction site. Chapter 12 (Non-Aboriginal heritage) of the Environmental Impact Statement identified the following potential impacts:

- permanent indirect impact (minor impact): alteration of heritage setting as Aerotropolis Core Station would be visible from this item from a distance of around 600 metres away and would not affect views to this item
- temporary indirect impact (minor impact): alteration of heritage setting (construction phase) as Aerotropolis Core Station construction site would be temporarily visible from this item but from some distance away.

A photograph of this view-line is provided in Figure 6-8.



Figure 6-8 View west from Kelvin towards the proposed Aerotropolis Core construction site (in vicinity of former RAAF base communications tower)

The view shows that a suburban subdivision has partially cluttered the views of the rural landscape to the west of the heritage item. While this view line is considered of exceptional value¹ to the significance of the heritage item, due to the distance between Kelvin and the project (approximately 600 metre distance between the heritage significant structures of the homestead and the proposed Aerotropolis Core construction site), the project would not wholly dominate this view-line.

Following the completion of the site inspection, it was determined that the assessment of indirect impacts in Table 12-6 of the Environmental Impact Statement, would remain unchanged.

Archaeological Research Design

Chapter 12 (Non-Aboriginal heritage) of the Environmental Impact Statement provides an overview of predicted archaeological remains and their significance, as well as an assessment of potential impacts that would occur from the project. Section 12.3.5 of the Environmental Impact Statement states that Archaeological Research Designs and archaeological excavation methodologies would be prepared in subsequent technical reports following finalisation of the Environmental Impact Statement for exhibition. Based on field survey undertaken for the project, St Marys construction site is the only site determined to have archaeological sensitivity.

The Archaeological Research Design (Appendix K) focuses on the St Marys construction site and has been prepared since the Environmental Impact Statement was finalised for public exhibition.

Changes to or additional performance outcomes and mitigation measures

Additional non-Aboriginal heritage assessment work has been completed since the exhibition of the Environmental Impact Statement. Kennett's Airfield has been physically investigated and it has been determined that it does not reach the threshold for heritage significance, as such mitigation measure NAH4 has been removed. In addition, the Archaeological Research Design has now been prepared and as such mitigation measure NAH5 has been revised. This is reflected in the revised mitigation measures as described in Table 7-2.

¹ Form Architects, 2006. *Kelvin Park, Bringelly Conservation Management Plan*

6.8.3 Aboriginal heritage assessment

The Environmental Impact Statement assessed potential impacts on Aboriginal heritage in Chapter 13 (Aboriginal heritage) of the Environmental Impact Statement and Technical Paper 5 – Aboriginal heritage.

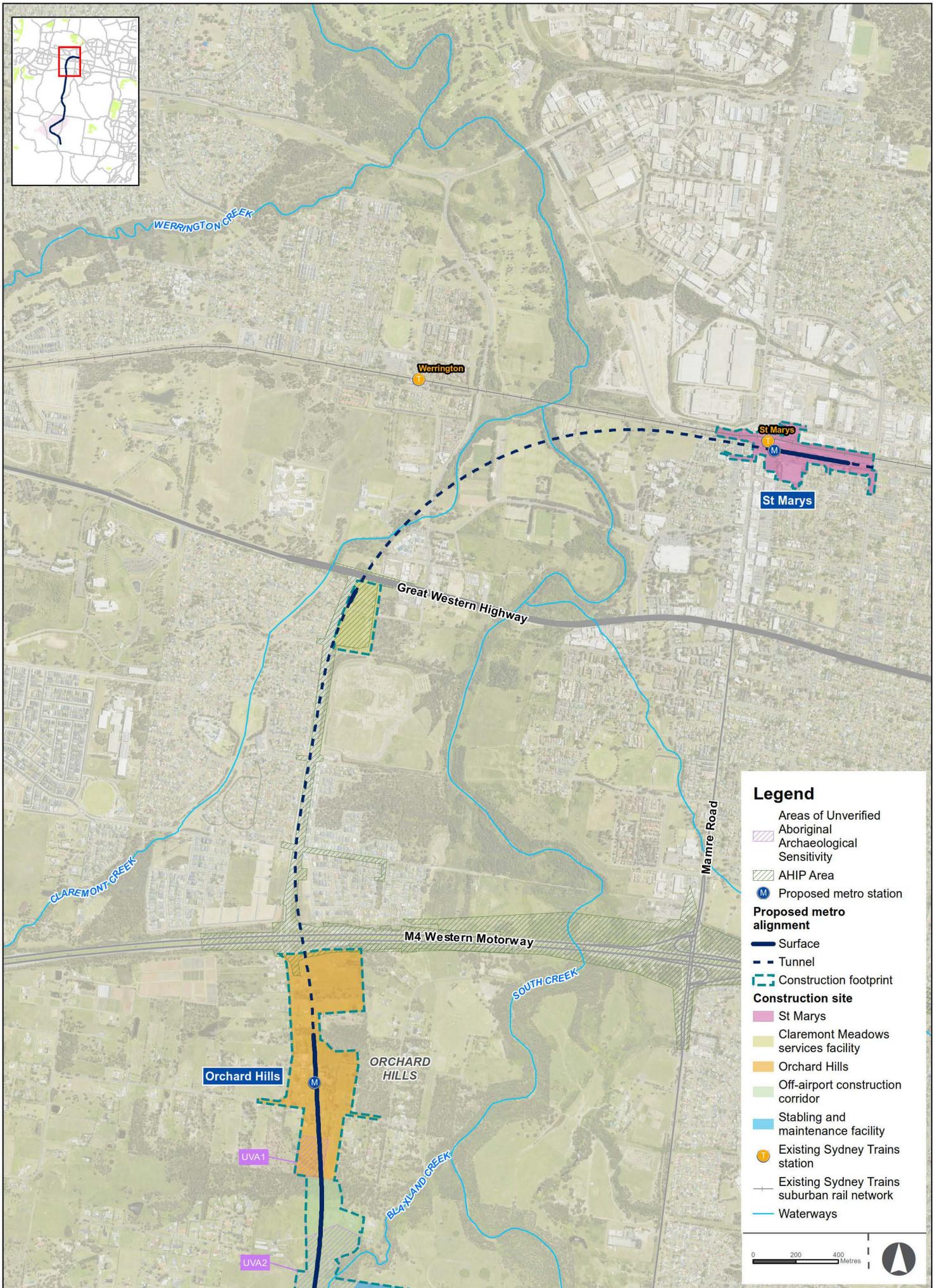
Additional field investigations and reporting has been undertaken since exhibition of the Environmental Impact Statement as further property access was made available. These additional investigations and reporting include:

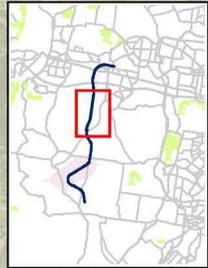
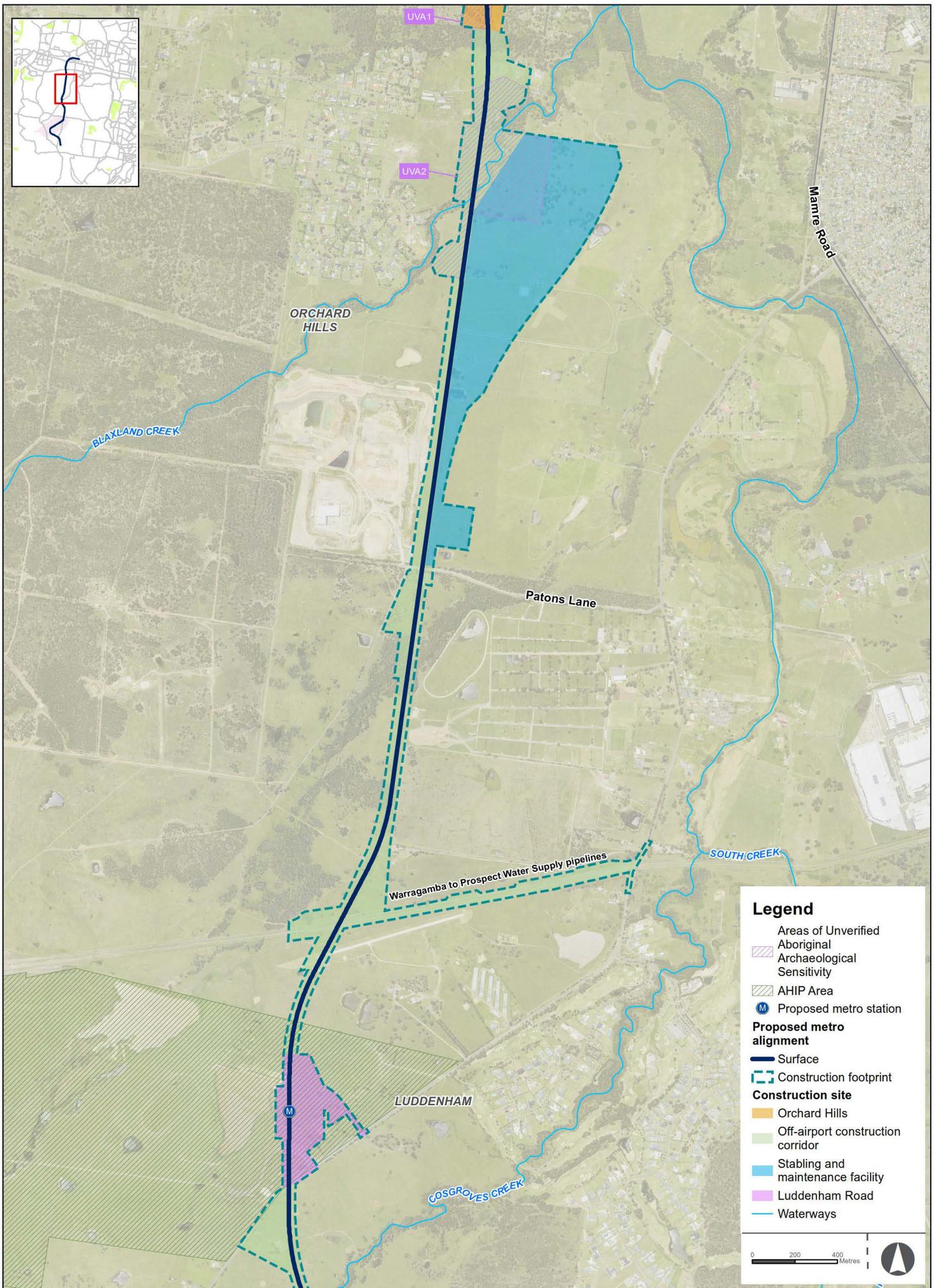
- field investigations for sites that were unable to be accessed previously (due to private property access constraints and COVID-19)
- archaeological test excavations to determine the presence or absence of subsurface archaeological deposits
- a Revised Aboriginal Cultural Heritage Assessment Report (Appendix H) has been prepared including cultural heritage findings of the additional field investigation
- an Aboriginal Cultural Heritage Management Plan (Appendix I) has been prepared to manage potential Aboriginal cultural heritage impacts identified in the Revised Aboriginal Cultural Heritage Assessment Report
- an Aboriginal Archaeological Report (Appendix J) has been prepared to document the archaeological findings from the archaeological test excavations.

The additional field investigation and reporting has been undertaken in consultation with Registered Aboriginal Parties and outlines management actions including conservation, protection and mitigation, as appropriate.

Taking into account the results of the archaeological survey and test excavation works undertaken for the project up to and including February 2021, a total of 10 Aboriginal archaeological sites are recognised as being wholly within the off-airport section of the construction footprint, and another two sites have Potential Archaeological Deposit curtilages partially extending into it. Works in the off-airport construction footprint are to be managed under the Aboriginal Cultural Heritage Management Plan, once approved.

Proposed ground disturbance activities within the off-airport construction footprint are anticipated to impact all of the 12 Aboriginal archaeological sites identified within it, with a total loss of value for 10 sites and partial impacts to two Potential Archaeological Deposits. There are also further areas of subsurface Aboriginal archaeological sensitivity that have not yet been subject to survey or test excavation due to landholder access limitations on the project to date, these are shown in Figure 6-9. The ongoing management of these sites is documented in the Aboriginal Cultural Heritage Management Plan.

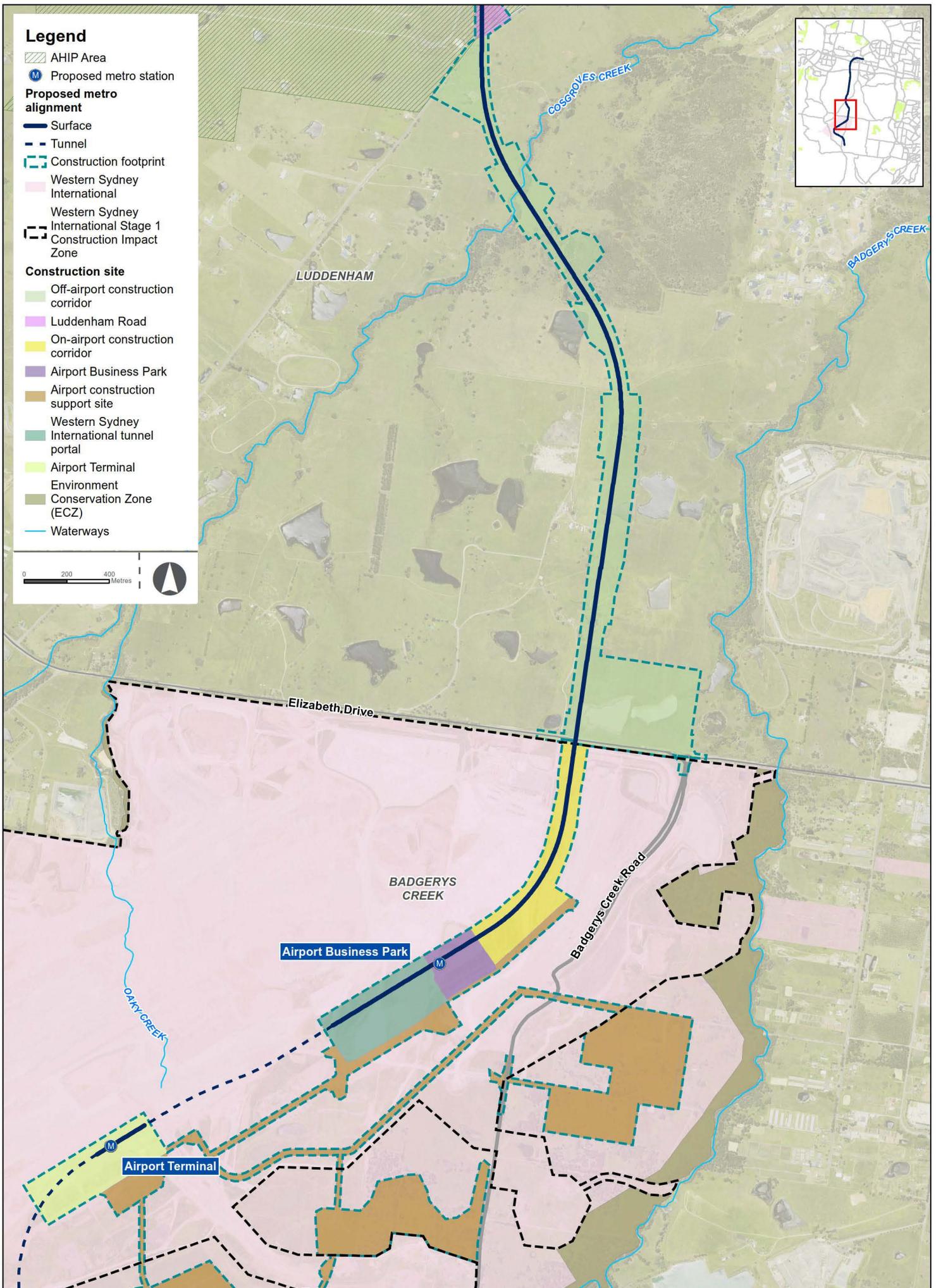




Legend

- Areas of Unverified Aboriginal Archaeological Sensitivity
- AHIP Area
- Proposed metro station
- Proposed metro alignment**
- Surface
- Construction footprint
- Construction site**
- Orchard Hills
- Off-airport construction corridor
- Stabling and maintenance facility
- Luddenham Road
- Waterways

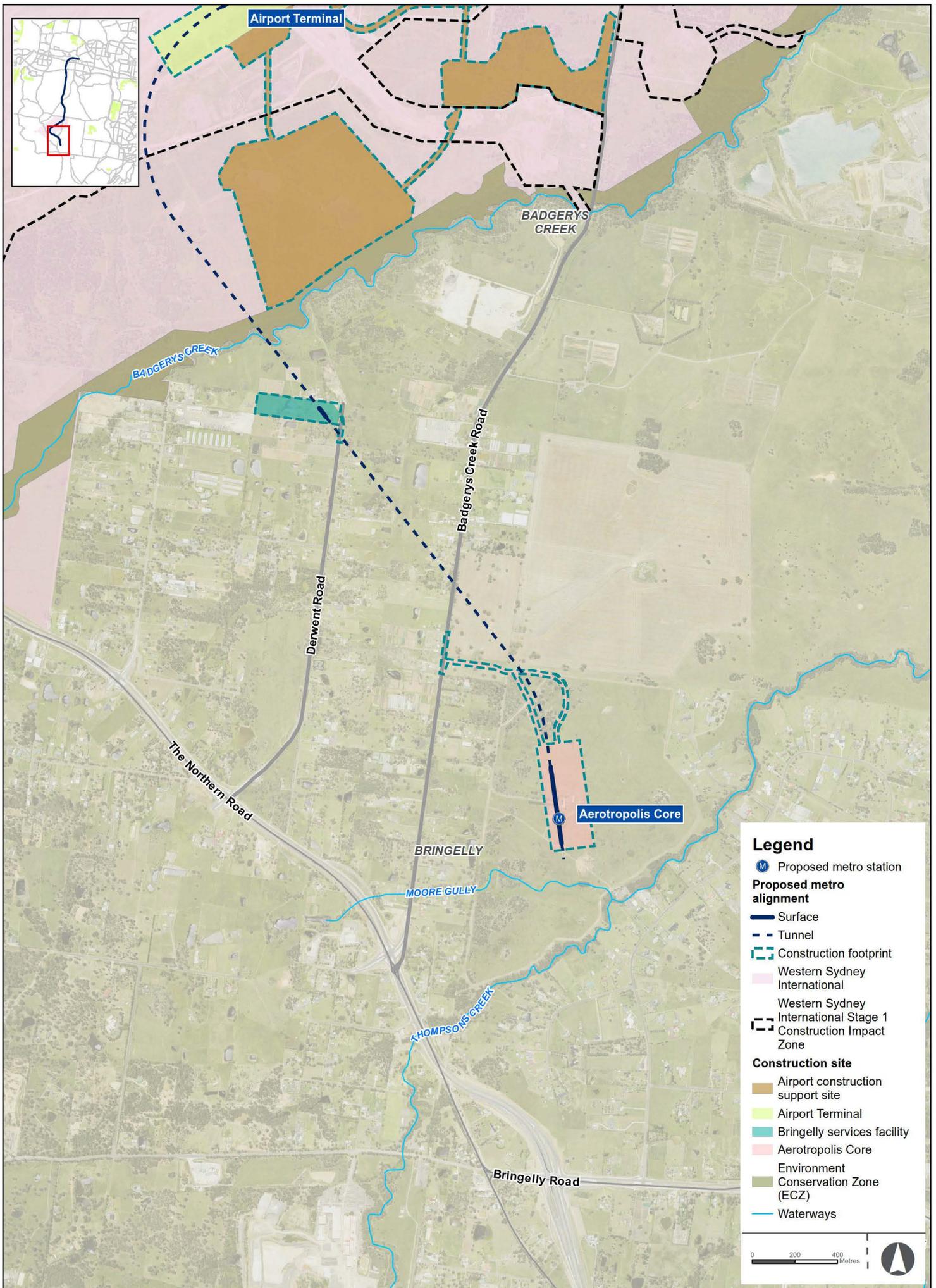
0 200 400 Metres



Verified archaeology and Archaeological sensitivity (AHIMS sites redacted)

Figure 6-9c

Indicative only, subject to design development



Changes to or additional performance outcomes and mitigation measures

Minor editorial changes have been made for clarity to performance outcomes for Aboriginal heritage as described in Table 7-1. New mitigation measures or additions to mitigation measures for Aboriginal heritage are described in Table 7-2.

6.8.4 Ground movement assessment

Further investigations of potential ground movement have been undertaken since preparation of the Environmental Impact Statement. This section provides an update of the preliminary assessment of potential ground movement that was provided in Chapter 15 (Groundwater and geology) of the Environmental Impact Statement.

Combined ground movements

Table 6-6 summarises the predicted combined ground movements from tunnel excavation, excavation of cut and cover stations and services facility shafts inclusive of groundwater drawdown. Table entries that are shaded and bolded indicate change compared to the Environmental Impact Statement. It should be noted that the combined ground movements would not be uniform across the excavation. Further assessment of ground movement would be carried out during design development based on the results of detailed geotechnical investigations and refinement of the project design and construction methodology.

Table 6-6 Summary of predicted combined construction ground movement – off-airport

Location	Indicative maximum excavation depth (m)	Indicative range of predicted ground movement (mm)	Indicative range of predicted ground surface slope (V:H)
St Marys Station (western end of station box)	About 15	40 to 55	1:200 to 1:1,000
St Marys Station (other areas - southern, eastern and northern end of station box)	About 15	20 to 30	1:500 to 1:2,000
St Marys Station (west side of Queen Street to the north of Nariel Street)	About 15	30 to 40	1:200 to 1:1,000
Claremont Meadows services facility (shaft)	About 25	40 to 50	1:200 to 1:500
Orchard Hills Station (northern end of portal structure)	About 15	15 to 40	1:200 to 1:1,000
Orchard Hills Station (southern end of portal structure and station)	About 10 to 15	25 to 40	1:200 to 1:2,000
Orchard Hills Station (southern dive section)	About 0 to 15	5 to 30	1:200 to 1:2,000
Bringelly services facility (shaft)	About 30	25 to 35	1:500 to 1:2,000
Aerotropolis Core Station (northern end of station box)	About 20	10 to 15	1:500 to 1:2,000
Aerotropolis Core Station (southern end of station box)	About 20	10 to 20	1:200 to 1:2,000

Note: St Marys Station is drained during construction and undrained (tanked) in the long term. Orchard Hills dive structure is drained during construction and in the long term. Only the groundwater drawdown effects during construction are included in the predicted ground movement predictions.

The ground movement predictions at the Orchard Hills Station as detailed in Table 6-6 are generally consistent with or slightly higher by comparison to those predicted in the Environmental Impact

Statement. The predicted impacts will primarily occur within the construction footprint in the areas immediately surrounding the station box, portal and dive structures.

The ground movement predictions at the Bringelly services facility are generally consistent with or slightly reduced by comparison to those predicted in the Environmental Impact Statement. The predicted impacts will primarily occur within the construction footprint in the areas immediately surrounding the tunnel shaft.

The ground movement predictions at Aerotropolis Core Station are generally consistent with or slightly reduced by comparison to those predicted in the Environmental Impact Statement. The predicted impacts will predominantly occur within the construction footprint in the areas immediately surrounding the station box.

In all of these locations predicted impacts to properties located outside of but adjoining the construction footprint will be in the range five to ten millimetres or less which is considered to represent negligible risk to buildings and structures based on Rankin (1988).

Heritage listed items

St Marys Station is a heritage listed item of State significance. A number of heritage assets associated with the station (including the Goods Shed, jib crane, signal box, the station building on platform 3/4, station platforms and pedestrian footbridge) are located in the vicinity of the tunnelling and cut and cover station excavation proposed to the south of the existing station.

The predicted settlement impacts on the signal box, station building on platform 3/4 and the station platforms are around 10 to 25 millimetres which is in the slight risk category (compared to negligible risk category as identified in the Environmental Impact Statement). The predicted settlement impact on the pedestrian footbridge is around 40 millimetres which is also in the slight risk category (the pedestrian footbridge was not identified in the Environmental Impact Statement).

The preliminary assessment has identified that without mitigation the Goods Shed may be subject to settlement of around 50 to 55 mm that could result in damage to this structure (no change in risk from the Environmental Impact Statement). Mitigation measure GW3 identifies a range of measures to manage potential ground movement impacts on the Goods Shed building during construction.

Three other heritage items are located in the vicinity of the proposed Aerotropolis Core Station and intersect sections of the proposed tunnel alignment. These include:

- two Water Tanks site (local significance)
- former Overseas Telecommunications Radio Station site group (local significance)
- Kelvin Park Group – the former driveway entry to the homestead (local significance).

The predicted settlement impacts on each of these heritage items is less than five millimetres which is in the negligible risk category. Predicted settlement impacts for these heritage items were not included in the Environmental Impact Statement.

6.8.5 Greenhouse gas assessment

An assessment of potential Scope 1, 2 and 3 greenhouse gas construction emissions was outlined in Table 17-5 of the Environmental Impact Statement.

In Section 8.9.4 of the Environmental Impact Statement, an opportunity was identified to reuse material from the project as fill material for future development at Western Sydney International. Subject to relevant approvals and agreement with Western Sydney Airport, spoil from both within and outside of the airport site could be placed at the permanent spoil placement area.

As a result of design refinement, a second potential permanent spoil placement area has been identified within Western Sydney International in consultation with Western Sydney Airport. While this change is outside the scope of this Submissions Report, the greenhouse gas assessment considers the project as a whole (on-airport and off-airport) and as such a revised assessment has been undertaken to reflect additional potential removal of vegetation associated with the second permanent spoil placement area within the airport site.

Potential Scope 1, 2 and 3 greenhouse gas sources for construction of the project, as well as estimated emissions by scope, are provided in Table 6-7, which compares the Environmental Impact Statement and revised estimates.

Table 6-7 Comparison of Environmental Impact Statement and Submissions Report for greenhouse gas emission sources for construction

Scope	Construction	Greenhouse gas emissions (tCO ₂ -e) (Environmental Impact Statement)	Greenhouse gas emissions (tCO ₂ -e) (revised)
Scope 1	Diesel fuel combusted onsite from mobile construction plant and equipment including on-site generators	170,460	170,460
	Removal of vegetation (including the release of carbon existing within this vegetation when it is cleared and the loss of its potential to act as a carbon sink in the future), in accordance with the methodology outlined in the <i>Greenhouse Gas Assessment Workbook for Road projects</i> (TAGG, 2013).	14,041	22,091
	Subtotal	184,501	192,551
Scope 2	Electricity generated offsite to power construction plant, equipment (including TBM operation) and site offices	420,490	420,490
	Subtotal	420,490	420,490
Scope 3	Emissions associated with the extraction and production of materials used during the construction of the project	670,800	670,800
	Transport emissions associated with the delivery of plant, equipment and construction materials	29,510	29,510
	Transport emissions associated with the removal of construction and demolition waste from site	35,800	35,800
	Decomposition of construction and demolition waste taken to landfill	19,250	19,250
	Emissions associated with fuel extraction, transmission and distribution associated with electricity which is used for the project	8,740	8,740
	Emissions associated with fuel extraction and processing for fuel supplied to construction plant and equipment	51,280	51,280
	Subtotal	815,380	815,380
Total		1,420,371	1,428,421

The only change is to Scope 1 emissions as a result of additional vegetation clearing. The Scope 1, 2 and 3 emissions for construction activities of the proposed project are estimated to be a total of around 1,428,400 tonnes of carbon dioxide equivalent (tCO₂-e), this is an increase of 8,050 tonnes of carbon dioxide equivalent (tCO₂-e) compared to the Environmental Impact Statement.

6.8.6 Revised cumulative impact assessment

Since exhibition of the Environmental Impact Statement, further information has become available regarding projects that interact or overlap with the Sydney Metro – Western Sydney Airport project and may therefore result in a change to potential cumulative impacts. This section presents an updated cumulative impact assessment to that provided in Chapter 24 (Cumulative impacts) of the Environmental Impact Statement and considers the following:

- changes to the future M12 Motorway project as outlined in the *M12 Motorway Amendment Report* and *M12 Motorway Amendment Report – Submissions Report* (Transport for NSW, 2020b)
- plans for Transport for NSW to provide expansion of a multi-storey car park as outlined in the St Marys Commuter Car Park Expansion Review of Environmental Factors (Transport for NSW, 2020c).

Amendment of the M12 Motorway project

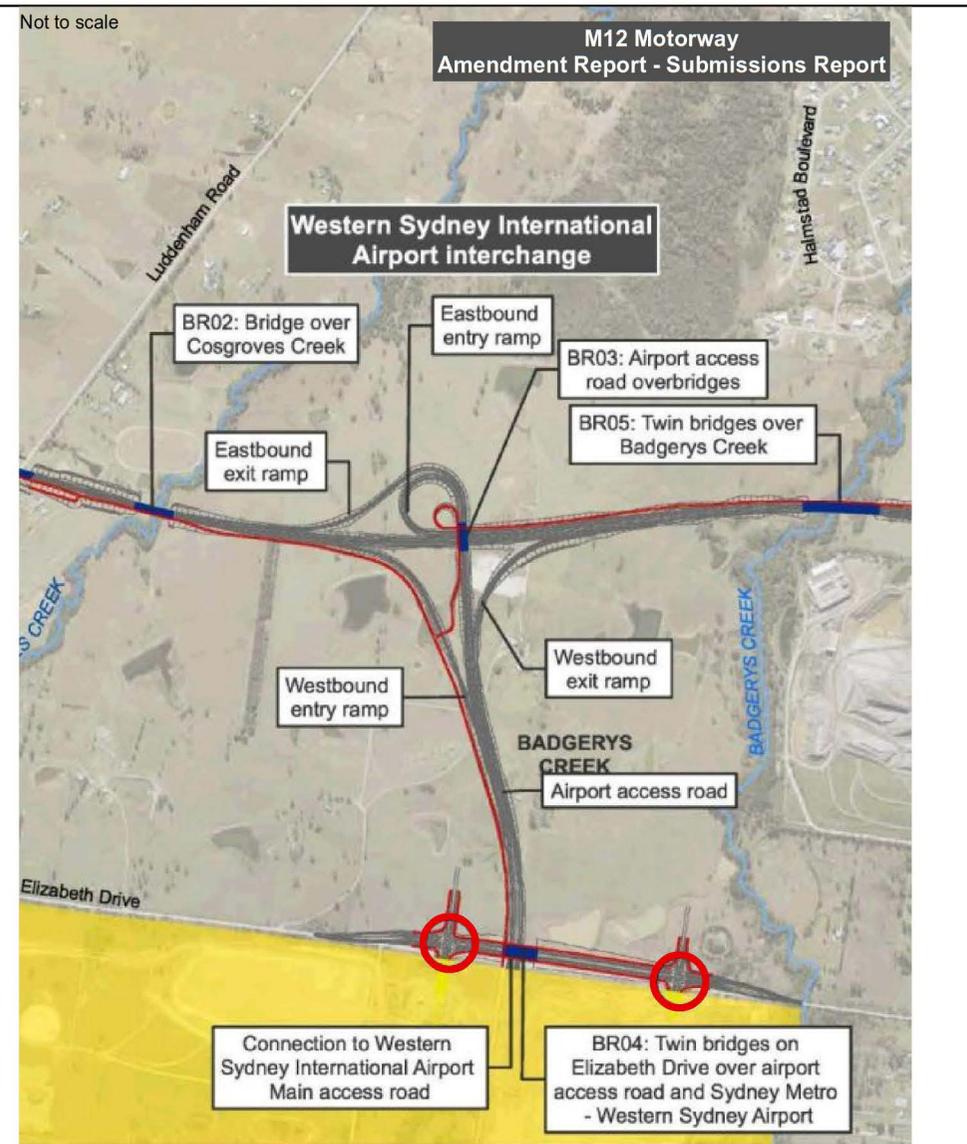
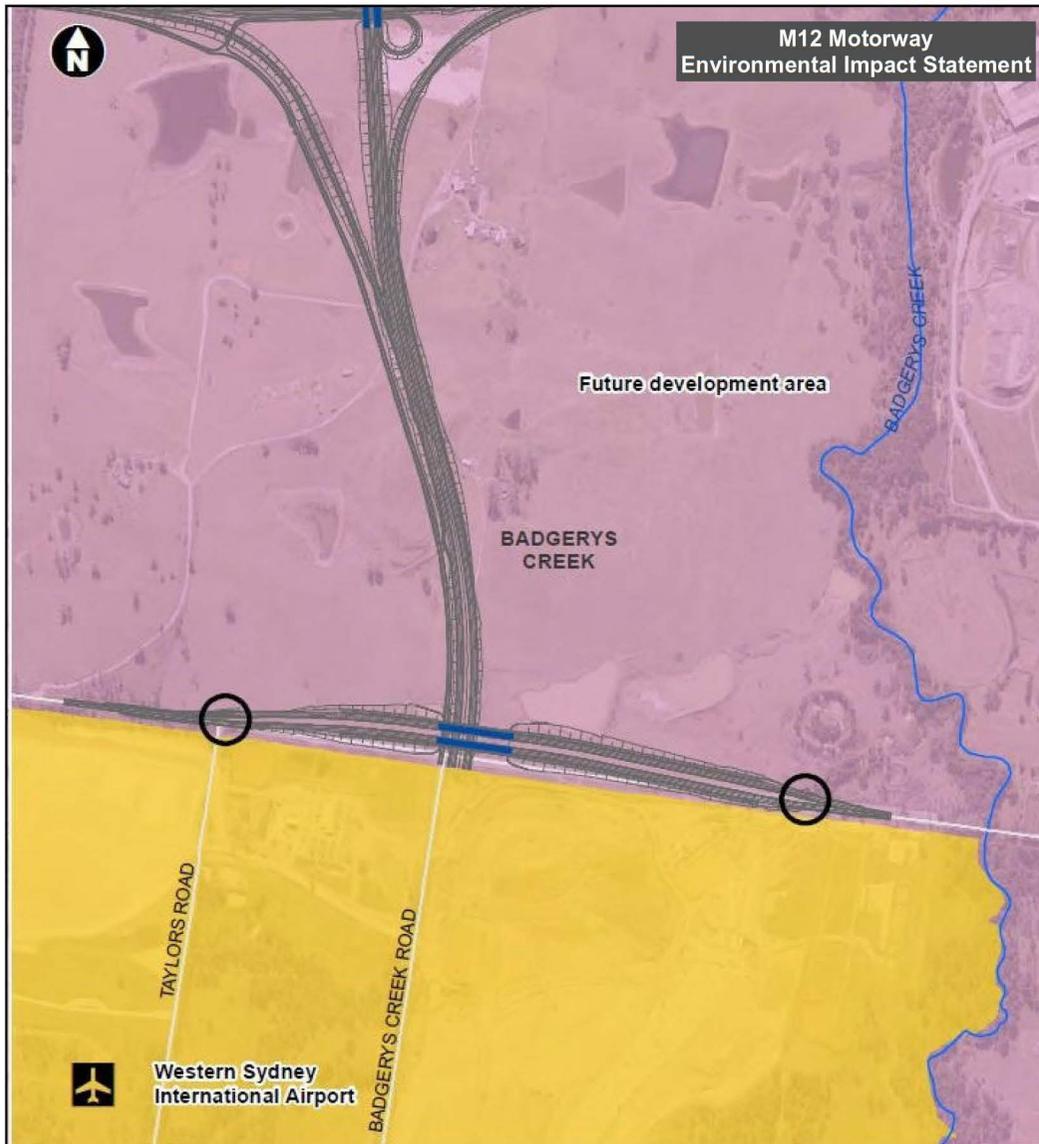
The M12 Motorway project as described in Chapter 24 (Cumulative impacts) of the Environmental Impact Statement is relevant when considering the cumulative impacts of the project, particularly during concurrent construction of the project and the M12 Motorway.

Since the Environmental Impact Statement was finalised for public exhibition, the *M12 Motorway Amendment Report* was published in October 2020, and describes the following proposed amendments relevant to the Sydney Metro – Western Sydney Airport project:

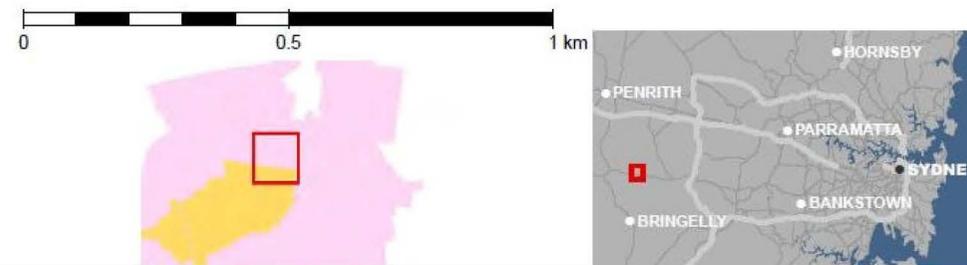
- construction and operation of two signalised intersection into the Western Sydney International site (see Figure 6-10). The intersections would include provision for future connection to potential developments to the north
- the operational footprint is proposed to be amended as a result of the proposed design changes and would comprise about 317 hectares (an increase of about 32 hectares)
- the construction program for the proposed M12 Motorway has been amended to allow certain construction activities to begin earlier and these would overlap with the construction activities associated with the project.

The *M12 Motorway Amendment Report – Submissions Report* was published in December 2020. This report results the following proposed amendments relevant to the Sydney Metro – Western Sydney Airport project:

- the refined operational footprint would comprise about 313 hectares, which is about 4 hectares smaller than the operational footprint as described in the *M12 Motorway Amendment Report*
- the refined construction footprint would comprise about 440 hectares, which is about 1 hectare smaller than the construction footprint as described in the *M12 Motorway Amendment Report*.



- The project as per EIS
- The amended project
- Shared user path
- Existing roads
- Waterways
- Bridges
- Western Sydney International
- Western Sydney Aerotropolis
- Potential future intersections (by others)
Note: Locations to be confirmed
- Intersection connecting into the Western Sydney International Airport
Note: Indicative, subject to detailed design



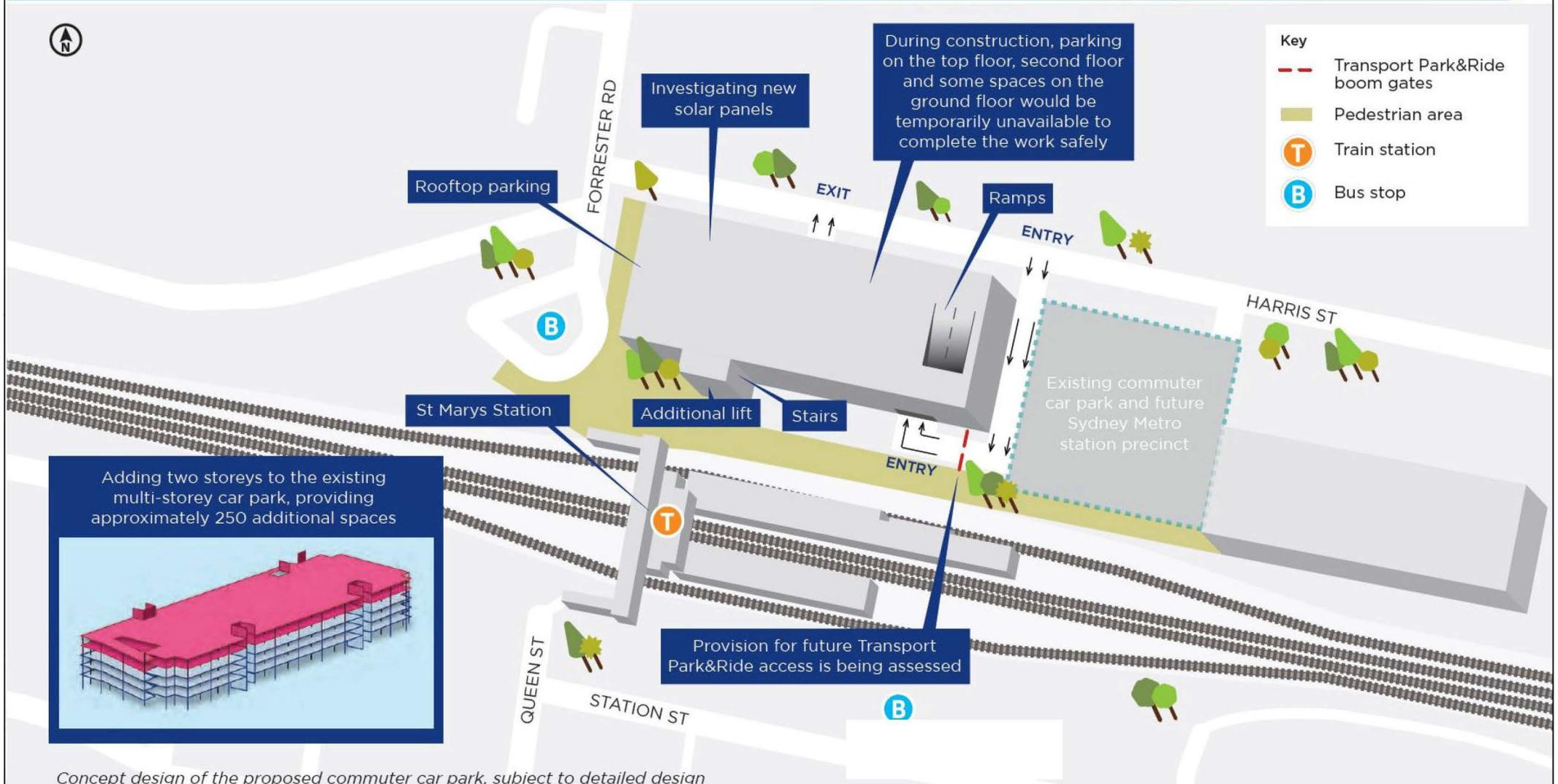
St Marys Commuter Car Park Expansion

Transport for NSW proposes to add two levels to the existing multi-storey commuter car park north of the St Marys Station at the corner of Forrester Road and Harris Street to provide around 250 new spaces (Figure 6-11). The proposal to extend the multi-storey car park prior is discussed in Chapter 9 (Transport) of the Environmental Impact Statement. This proposed expansion is outside of the scope of the project.

The St Marys Commuter Car Park Expansion Review of Environmental Factors (Transport for NSW, 2020) was determined in February 2021. Work on this project is expected to commence in 2021 and be completed by early 2022.

St Marys | Commuter Car Park Concept Design

Approximately 250 additional parking spaces are proposed



Concept design of the proposed commuter car park, subject to detailed design

Additional assessment - M12 Motorway

Traffic and transport

As part of the *M12 Motorway Amendment Report*, further WestConnex Road Traffic Model updates have been undertaken using more recent traffic data and updated land use and demographics data (based on 2016 land use forecasts by Department of Planning, Industry and Environment and adjusted to include Western Sydney International forecast data). The model for the *M12 Motorway Amendment Report* indicates that there is an overall reduction in forecast future trips to the South West Growth Area in Western Sydney in 2036 compared to the forecast future trips reported in the M12 Environmental Impact Statement, which were based on 2014 land use forecasts by the Department of Planning, Industry and Environment. This would indicate that traffic forecasts are likely to be lower by comparison to those reported in the Environmental Impact Statement. As such, the traffic assessment prepared for the project Environmental Impact Statement is considered likely to be conservative. The cumulative transport operational assessment presented in Chapter 24 (Cumulative impact) of the Environmental Impact Statement therefore presents a more conservative assessment of potential impacts.

The project would be designed to meet the operational performance outcomes for hydrology and flooding listed in Table 24-6 of the Environmental Impact Statement. This includes the requirement that cumulative impacts are minimised through coordination of construction activities and communication processes with nearby major projects. Mitigation measures outlined in Chapter 7 (Revised performance outcomes and mitigation measures) to minimise potential cumulative transport impacts would be implemented including coordination with Western Sydney Airport and Transport for NSW through the Traffic and Transport Liaison Group (T3) and preparation of a Cumulative Construction Impacts Management Plan to manage the interface of other projects under construction at the same time as the project (CL1).

Biodiversity

An increased construction and operational footprint for the amended M12 Motorway project would result in additional impacts to biodiversity by comparison to that presented in the Environmental Impact Statement for the M12 Motorway project.

Since exhibition of the Environmental Impact Statement, further design development has resulted in additional vegetation removal required for the on-airport components of the Sydney Metro – Western Sydney Airport project (potential permanent spoil placement areas) by comparison to that described in the Environmental Impact Statement. The biodiversity impacts associated with this change have been assessed in the Revised Biodiversity Development Assessment Report (Appendix G) and the final Environmental Impact Assessment of on-airport proposed action (2019/8541).

When the design changes for both projects are considered, the total cumulative area of native vegetation to be removed has increased from 540 hectares as presented in Chapter 24 (Cumulative impact) of the Environmental Impact Statement, to 561 hectares as outlined in Table 6-8.

Table 6-8 Summary of revised cumulative biodiversity impacts

Vegetation type	Western Sydney International ¹	Future M12 Motorway	The Northern Road	St Marys Intermodal	Sydney Metro – Western Sydney Airport	Total
Area (Ha)²						
Cumberland Plain Woodland (CEEC)*	272.80	66.86	30.87	0	39.80	410.33
River-flat Eucalypt Forest (EEC)*	47.6	3.18	3.86	0.72	18.06	73.42
Shale-Gravel Transition Forest (EEC)	5.9	6.91	0	0	10.42	23.23

Vegetation type	Western Sydney International ¹	Future M12 Motorway	The Northern Road	St Marys Intermodal	Sydney Metro – Western Sydney Airport	Total
Area (Ha)²						
Swamp oak floodplain forest (EEC)	0	2.82	0	0	5.38	8.20
Moist Shale Woodland (EEC)	0	0.44	0	0	0.00	0.44
Other non-threatened native vegetation	37.20	0.57	6.06	1.51	0.01	45.35
Total	363.50	80.78	40.79	2.23	73.67	560.97

Notes:

1 Impacts derived from Western Sydney International Biodiversity Offsets Delivery Plan (Commonwealth of Australia, 2018)

2 Areas subject to change

* CEEC – Critically endangered ecological community

* EEC – Endangered ecological community

While the cumulative biodiversity impact resulting from the amended M12 Motorway project and the Sydney Metro – Western Sydney Airport project would increase, changes to the cumulative biodiversity impacts as a result of the project alone (when compared to the Environmental Impact Statement) are minor. Further detail on the revised cumulative impacts is provided in the Revised Biodiversity Development Assessment Report.

Biodiversity related performance outcomes and mitigation measures outlined in Chapter 7 (Revised performance outcome and mitigation measures), such as the preparation of a Flora and Fauna Management Plan (mitigation measure FF1), preparation of a Nest Box Strategy (FF2), maintain wildlife connectivity (mitigation measure OFF1), and designing viaduct structures over wildlife/riparian corridors to minimise vegetation removal (mitigation measure OFF2) would manage potential cumulative biodiversity impacts.

Flooding and hydrology

The amended M12 Motorway project would extend further into the Badgerys Creek floodplain than described in the M12 Motorway Environmental Impact Statement. Additional management measures have been included for the M12 Motorway including refining the Elizabeth Drive design to minimise flood affectation at Badgerys Creek floodplain and further consultation with the Western Sydney International regarding their flood management. The final location of on-site detention and water quality basins and flood-proofing of excavations for the Sydney Metro project would be confirmed during design development (see mitigation measure HYD1) that would consider potential changes to the M12 Motorway.

Noise and vibration

The amended M12 Motorway project would not affect the cumulative operational noise and vibration assessment presented in Chapter 24 (Cumulative impacts) of the Environmental Impact Statement.

Additional assessment – St Marys Commuter Car Park Expansion

Traffic and transport

Construction of the St Marys Commuter Car Park Expansion is expected to commence early in 2021 and take around 12 months to complete. Therefore, construction of the St Marys Commuter Car Park Expansion may overlap with construction of the project at St Marys for a period of around nine months.

Construction of the multi-storey car park is expected to generate around 48 heavy vehicle and 48 light vehicle movements per working day with construction vehicles likely to use a combination of Glossop Street, Harris Street and Forrester Road to access the site. This additional construction traffic would

have a minor impact on the local road network and is therefore not expected to change the potential cumulative transport impacts outlined in Chapter 24 (Cumulative impact) of the Environmental Impact Statement.

Potential cumulative transport construction impacts at St Marys are similar to those discussed in Section 6.1.4 of Technical Paper 1 – Transport. The cumulative construction impacts for the project at St Marys would include overlap between the project and the construction of the St Marys Intermodal Facility. The Environmental Impact Statement identifies that any overlap with this project would result in minimal impacts in combination with the project due to the low construction traffic likely to be generated during the overlap period.

During construction of the St Marys Commuter Car Park Expansion there would be a temporary loss of around 295 car parking spaces. While the existing at-grade commuter car park on Harris Street to the east would remain available (between 120 and 130 spaces) during this construction period, there would still be a temporary net loss of commuter parking. However, as discussed in Section 6.5, parking capacity is available both on-street and off-street within close proximity of the lost parking spaces during the peak periods to accommodate car parking lost during construction. On completion of the expansion there will be a net addition of about 120 commuter car parking spaces in the St Marys precinct.

A new mitigation measure (T9) has been developed to preparation and implementation of a construction worker car parking strategy to manage any potential impacts to car parking in St Marys.

Noise and vibration

During concurrent construction of the St Marys Commuter Car Park Expansion and the project for a period of around nine months, there is potential for cumulative noise impacts at receivers near both work sites within noise catchment areas NCA01 and NCA03 (refer to Figure 24-4 of the Environmental Impact Statement). The noisiest works associated with construction of the St Marys Commuter Car Park Expansion would occur during demolition of kerbs and pavements, primarily due to the use of concrete saws and jackhammers, which is likely to occur before main construction work for the Sydney Metro – Western Sydney Airport project begins.

Depending on the construction program for each project, noisy demolition works from both projects may overlap and result in noise levels being up to 3dB higher than that presented in Chapter 24 (Cumulative impacts) of the Environmental Impact Statement. However, if the demolition works for the St Marys Commuter Car Park Expansion are completed prior to commencement of the Sydney Metro project, then construction noise levels would be significantly lower than the noise generated from the site establishment and enabling works phases of the project.

Mitigation measure CL1 requires the preparation of a Cumulative Construction Impacts Management Plan to manage the interface of other projects including the St Marys Commuter Car Park Expansion in consultation with Transport for NSW. This would include provision of regular updates to the detailed construction program, construction sites and haul routes and development of mitigation strategies to manage cumulative impacts associated with these interfaces.

The St Marys Commuter Car Park Expansion would not affect the cumulative operational noise and vibration assessment presented in Chapter 24 (Cumulative impacts) of the Environmental Impact Statement.

7 Revised performance outcomes and mitigation measures

This chapter provides a complete set of revised performance outcomes and environmental mitigation measures, highlighting how they have changed compared with the performance outcomes and mitigation measures in the Environmental Impact Statement.

7.1 Introduction

Environmental management for the project would be undertaken through the approach detailed in Chapter 25 (Environmental management and mitigation) of the Environmental Impact Statement. The construction and operational environmental management frameworks are discussed in Sections 25.2 and 25.3 of the Environmental Impact Statement respectively.

Under these broad frameworks, a series of performance outcomes were developed to define the minimum environmental standards that would be achieved during construction and operation of the project, and mitigation measures that would be implemented during construction and operation to manage potential identified impacts.

The performance outcomes and mitigation measures presented in Chapter 27 (Synthesis) of the Environmental Impact Statement have been updated and provided in this report with consideration given to:

- submissions received – as addressed in Chapters 4 and 5
- clarifications to the Environmental Impact Statement and additional field work and assessment undertaken – as outlined in Chapter 6.

The assessment carried out for the clarifications, and the submissions process, has identified the need for some new mitigation measures, the wording of some existing measures to be adjusted and the deletion of some measures (where impacts have now been avoided through the clarifications or as a result the actions detailed in the measures having been completed). There have also been some changes made for clarity and ease of implementation, for example all mitigation measures identified to manage operational impacts are now pre-fixed by 'O' and the numbering has been amended so that all operational mitigation measures start at one and are then numbered sequentially.

Table 7-1 provides the full set of revised performance outcomes and Table 7-2 provides the full set of revised mitigation measures to avoid, mitigate and/or manage the potential impacts of the project. Additions to performance outcomes and mitigation measures included in the Environmental Impact Statement are shown in bold text, with deletions shown with a strikethrough.

Appendix B (Revised project description and performance outcomes and mitigation measures) includes a full list of performance outcomes and mitigation measure without the bold text or strikethrough edits. These tables supersede the performance outcomes and mitigation measures presented in the Environmental Impact Statement.

7.2 Revised performance outcomes

Table 7-1 shows the revised performance outcomes. Performance outcomes which have been added, removed or changed since exhibition of the Environmental Impact Statement are presented in orange shading. Additions to performance outcomes included in the Environmental Impact Statement are shown in bold text, with deletions shown with a strikethrough.

Table 7-1 Revised performance outcomes

SEARS desired performance outcome	Project performance outcome	Phase
Design, place and movement		
Supporting the provision of successful places - the project is integrated with and enhances the environment where it is located, including	The Sydney Metro – Western Sydney Airport Design Guidelines and Design Quality Framework are implemented to deliver a rail corridor, stations and ancillary facilities that achieve the project vision and design objectives	Operation

SEARS desired performance outcome	Project performance outcome	Phase
improved accessibility and connectivity for communities	Design excellence is exhibited in the project to complement the anticipated character of the precincts in which the project is located	Operation
	Accessibility and connectivity between future communities is supported by the project through opportunities to integrate with key project components such as stations	Operation
	Within Western Sydney International, the project is integrated with and supports the outcomes and design objectives set out in the Airport Plan, future master plans for Western Sydney International and design guidelines for Western Sydney International	Operation
The project contributes to greener places through supporting the enhancement and provision of green infrastructure	The number of trees within the project area is increased at a ratio of 2:1 (for vegetation removal not subject to biodiversity offset); and tree canopy coverage is increased , using a range of local species to enhance canopy coverage , subject to the constraints on tree planting associated with safe airport operations	Operation
Transport		
Network connectivity, safety and efficiency of the transport system in the vicinity of the project are managed to minimise impacts The safety of transport system customers is maintained Impacts on network capacity and the level of service are effectively managed	Safe and efficient routes are provided for pedestrians, cyclists and road users at/near construction sites	Construction
	Access to the existing St Marys Station is maintained while train services are operating	Construction
	Safe access to properties and businesses is maintained during construction, unless alternatives are agreed with property owners and businesses	Construction
	Heavy vehicles access the arterial network as soon as practicable on route to, and immediately after leaving, a construction site	Construction
	The local community and relevant authorities are informed of transport, access and parking changes/impacts to minimise inconvenience to the public	Construction
	Safe and efficient interchanges are provided between transport modes	Operation
	Transport interchange facilities provided at station precincts are designed in accordance with the modal access hierarchy	Operation
	Each station and station plaza is provided with sufficient customer capacity to achieve a minimum Fruin's Level of Service C (for 2056 demand)	Operation
	Stations and interchanges are fully accessible and compliant with the <i>Disability Discrimination Act 1992</i> (Cth) and the <i>Disability Standards for Accessible Public Transport</i> (Australian Government, 2002)	Operation
	Works are compatible with existing infrastructure and future transport corridors	The project is designed to be compatible with existing infrastructure and future transport corridors

SEARS desired performance outcome	Project performance outcome	Phase
Noise and vibration		
Construction noise and vibration (including airborne noise, ground-borne noise and blasting) is effectively managed to minimise adverse impacts on acoustic amenity Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on the structural integrity of buildings and items including Aboriginal places and environmental heritage	Construction noise and vibration impacts on local communities (including airborne noise and ground-borne noise and vibration) are managed in accordance with the Sydney Metro Construction Noise and Vibration Standard, the <i>Interim Construction Noise Guideline</i> , and the Airports (Environment Protection) Regulations 1997	Construction
	Structural damage to buildings, heritage items and public utilities and infrastructure, including the Warragamba to Prospect Water Supply Pipelines, from construction vibration to be avoided	Construction
Increases in noise emissions and vibration affecting nearby properties and other sensitive receivers during operation of the project are effectively managed to protect the amenity and well-being of the community	Operational noise and vibration levels from rail operations are managed in accordance with the Rail Infrastructure Noise Guidelines and Airports (Environment Protection) Regulations 1997 Operational noise levels for the stabling and maintenance facility, stations and other fixed infrastructure are managed in accordance with the <i>Noise Policy for Industry 2017</i>	Operation
Biodiversity		
The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity	Minimise or where possible avoid impacts on threatened flora and fauna species, and ecological communities listed under the <i>Biodiversity Conservation Act 2016</i> (NSW) and <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)	Construction
	Manage groundwater drawdown at Orchard Hills to avoid or minimise impacts on groundwater dependent ecosystems	Construction
	No removal of any vegetation within the Thompsons Creek riparian zone or any adjacent areas that are non-certified under the South West Growth Area	Construction
	Culverts and bridges would be appropriately sized to maintain fauna habitat connectivity	Operation
	Maintain integrity and functionality of rail corridor fencing to minimise wildlife-train collision while providing opportunities for cross-corridor wildlife movement	Operation
	Re-establish native vegetation in accordance with the National Airports Safeguarding Framework Principles and Guidelines including <i>Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports</i> (Australian Government, 2014)	Operation

SEARS desired performance outcome	Project performance outcome	Phase
Offsets and/or supplementary measures are assured which are equivalent to any residual impacts of project construction and operation	Impacts on threatened ecological communities and threatened species are offset in accordance with the requirements of the <i>NSW Biodiversity Assessment Method</i> (OEH, 20178)	Construction
Non-Aboriginal heritage		
The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of environmental heritage The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage	Impacts on the State heritage significant St Marys Railway Station Group are avoided or minimised so that the overall heritage value of the item is maintained	Construction
	Impacts on non-Aboriginal heritage items and archaeology are minimised or where possible avoided	Construction
	The design of St Marys Station is sympathetic to retained and adjacent heritage items	Operation
	An appropriately qualified and suitably experienced heritage architect and relevant stakeholders are consulted during design development	Operation
	The design of the project incorporates non-Aboriginal heritage interpretation	Operation
Aboriginal heritage		
The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of Aboriginal objects and places The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of Aboriginal objects and places	The heritage significance of Aboriginal objects and places are protected, conserved and/or managed in order to ensure the project does not diminish the story and cultural understanding associated with the objects and places of Aboriginal people in New South Wales	Construction
	Impacts on areas of archaeological sensitivity potential and significance are avoided or minimised, where practical	Construction
	The design of the project incorporates Aboriginal heritage interpretation and Aboriginal cultural design principles in consultation with Aboriginal knowledge holders stakeholders	Operation
Flooding, hydrology and water quality		
The project minimises adverse impacts on flooding characteristics Construction and operation of the project avoids or minimises the risk of, and adverse impacts from, infrastructure flooding, flooding hazards, or dam failure Long term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised The environmental values of nearby, connected and	Land and property beyond the construction footprint would not be impacted by construction for the 0.5 Exceedances per Year (EY) storm event	Construction
	No aspect of construction to materially adversely affect existing water quality in receiving waters to a minimum 0.5 EY storm event, or in line with the 'Blue Book' (<i>Managing Urban Stormwater: Soils & Construction Volume 1</i> (Landcom, 2004))	Construction

SEARS desired performance outcome	Project performance outcome	Phase
<p>affected water sources, groundwater and dependent ecological systems including estuarine and marine water (if applicable) are maintained (where values are achieved) or improved and maintained (where values are not achieved)</p> <p>Sustainable use of water resources</p> <p>The project is designed, constructed and operated to protect the NSW Water Quality Objectives where they are currently being achieved, and contribute towards achievement of the Water Quality Objectives over time where they are currently not being achieved, including downstream of the project to the extent of the project impact including estuarine and marine waters (if applicable)</p>	<p>No material change to channel shape within the construction footprint for the 0.5 EY storm event for streams classified first order and higher</p>	<p>Construction</p>
	<p>Water discharged from the project, including runoff from hardstand areas, surface and ground water storages would:</p> <ul style="list-style-type: none"> contribute towards achieving ANZECC guideline water quality trigger values for physical and chemical stressors for slightly disturbed ecosystems in lowland rivers in southeast NSW, or meet any water quality criteria determined in consultation with the NSW Environment Protection Authority (off-airport) where an EPL is required or in consultation with Western Sydney Airport in accordance with the Airports (Environmental Protection) Regulations 1997 (on-airport) 	<p>Construction and operation</p>
	<p>Drainage from the project (including the stabling and maintenance facility, service facilities and stations) designed in accordance with local council requirements for managing urban stormwater quality and quantity</p>	<p>Operation</p>
	<p>For all land currently flooded up to the one per cent annual exceedance probability event, no change to peak flood levels up to the following limits, unless otherwise agreed with the affected property owner:</p> <ul style="list-style-type: none"> residential, commercial, critical infrastructure – no new above floor flooding, maximum change of 10 millimetres for existing flooded buildings and maximum of 50 millimetres for properties where flooding is below floor level roads – maximum change of 50 millimetres Crown land open space, farming, grazing and cropping land – maximum change of 200 millimetres 	<p>Operation</p>
	<p>Where flood water velocities are currently below one metre per second (m/s), the project is designed and operated to ensure they remain below one metre per second. Where velocities are above one m/s, an increase of no more than 20 per cent is permitted</p>	<p>Operation</p>
	<p>No change to flood hazard vulnerability classification limits for residential and commercial buildings or roads</p>	<p>Operation</p>
	<p>No change to flood hazard vulnerability classification limits for all land types as a result of the location placement of the permanent spoil placement areas stockpile site at Western Sydney International</p>	<p>Operation</p>
	<p>No change to the one per cent annual exceedance probability duration of inundation up to the following limits:</p> <ul style="list-style-type: none"> residential, commercial, critical infrastructure – no increase for above floor flooding roads – maximum change of 10 per cent increase in duration agricultural land for cropping – dependant on cropping type 	<p>Operation</p>

SEARS desired performance outcome	Project performance outcome	Phase
	For moderate and high fragility watercourses impacted by the project (as defined by the NSW River Styles mapping (NSW, Department of Planning, Industry and Environment 2019)), maintain existing flow regimes and velocities as best as possible to preserve and minimise changes to the watercourses	Operation
	Critical infrastructure (including stations entries and tunnel portals) to have immunity against the probable maximum flood event	Operation
Groundwater and geology		
Long term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised	Groundwater availability and quality for water supply and environmental benefit (e.g. groundwater dependent ecosystems) is not affected beyond the requirements outlined in the <i>NSW Aquifer Interference Policy</i>	Construction and operation
	Structural damage to buildings, heritage items and public utilities and infrastructure, including the Warragamba to Prospect Water Supply Pipelines, from ground movement to be avoided	Construction
Soils and contamination		
The environmental values of land, including soils, subsoils and landforms, are protected Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination	Contamination risks to human health and ecological receivers are minimised through effective management of existing contaminated land	Construction
	Contaminated land and soil within the footprint of the project is remediated where required, to ensure the land is suitable for the intended future land use	Operation
Sustainability, climate change and greenhouse gas		
The project reduces the NSW Government's operating costs and ensures the effective and efficient use of resources Conservation of natural resources is maximised	The project achieves a minimum 'Design' and 'As built' rating score of Leading +7565 to 75 , using the Infrastructure Sustainability Council of Australia Infrastructure Sustainability Rating Scheme Version 1.2 or equivalent	Operation
	Sustainability initiatives are incorporated into the planning, design and construction of the project	Construction and operation
	100 per cent of the greenhouse gas emissions associated with consumption of electricity during operation are offset	Operation
	25 per cent of the greenhouse gas emissions associated with consumption of electricity during construction are offset	Construction
The project is designed, constructed and operated to be resilient to the future impacts of climate change	The project is designed to withstand known impacts associated with climate change to year 2100 be resilient to the long-term consequences of climate change	Construction and operation

SEARS desired performance outcome	Project performance outcome	Phase
Resource management		
Conservation of natural resources is maximised	100 per cent of useable spoil is reused in accordance with the spoil reuse hierarchy	Construction
	A minimum 95 per cent recycling target is achieved for construction and demolition waste	Construction
	Products made from recycled content are prioritised	Construction
	The use of potable water for non-potable purposes is avoided if non-potable water is available	Construction and operation
	The reuse of water is maximised, either on-site or off-site	Construction and operation
Cumulative impacts		
	Cumulative impacts are managed through coordination of construction activities and communication processes with nearby major projects (Western Sydney International, M12 Motorway, The Northern Road, St Marys Intermodal) and St Marys Commuter Car Park Expansion	Construction

7.3 Revised mitigation measures

Table 7-2 shows the revised mitigation measures. Mitigation measures which have been added, removed or changed since exhibition of the Environmental Impact Statement are presented in orange shading. Additions to mitigation measures included in the Environmental Impact Statement are shown in bold text, with deletions shown with a strikethrough.

Table 7-2 Revised mitigation measures

Ref	Mitigation measures	Applicable location(s)
Transport – construction		
T1	Construction Traffic Management Plans would be prepared in accordance with the Construction Traffic Management Framework	All
T2	The Construction Traffic Management Plan for St Marys would be developed in consultation with the Traffic and Transport Liaison Group to ensure existing transport interchange infrastructure continues to operate effectively within the St Marys station precinct would be developed in consultation with the Traffic and Transport Liaison Group.	St Marys construction site
T3	Coordination with Western Sydney Airport and Transport for NSW would be undertaken through the Traffic and Transport Liaison Group to manage potential cumulative construction traffic impacts with M12 Motorway and Elizabeth Drive	All
T4	Road Safety Audits would be carried out to address vehicular access and egress, and pedestrian, cyclist and public transport safety. Road Safety Audits would be carried out as per the guidelines outlined in Section 10 of the Construction Traffic Management Framework	All
T5	Maintain access for pedestrians and cyclists around construction sites as per the guidelines outlined in the Construction Traffic Management Framework. Appropriate signage and line marking would be provided to guide pedestrians and cyclists past construction sites and on the surrounding network to allow access to be maintained	All

Ref	Mitigation measures	Applicable location(s)
T6	Access for construction vehicles to be planned as per the guidelines outlined in the Construction Traffic Management Framework. Construction site traffic would be managed to minimise movements during peak periods. Vehicle access to and from construction sites would be managed to maintain pedestrian, cyclist and motorist safety	All
T7	Temporary relocation of bus stops and the bus layovers at to the Station Street car park in St Marys relocations would be subject to further design development, including consideration of the use of the Station St car park. Bus stop relocations would be implemented prior to the commencement of construction works that impacts on the existing bus facilities. The temporary relocation of bus stops and the bus layover at St Marys would be carried out in consultation with the Transport for NSW, Penrith City Council and bus operators. Wayfinding and customer information would guide customers to temporary bus stop locations	St Marys construction site
T8	Transport for NSW would be consulted to discuss opportunities for their delivery of intersection upgrades at Mamre Road/M4 Western Motorway on and off ramps prior to the peak year of construction	Off-airport construction corridor Stabling and maintenance facility construction site Luddenham Road construction site
T9	A construction worker car parking strategy for St Marys would be prepared in consultation with Penrith City Council and Transport for NSW prior to the commencement of construction. The strategy would seek to: <ul style="list-style-type: none"> minimise overall demand for construction worker car parking through initiatives such as use of other project construction worksites in combination with shuttle buses, car-pooling and encouraging the use of public transport minimise potential use of on-street car parking by construction workers The construction worker car parking strategy would be implemented throughout construction	St Marys
Transport – operation		
OT1 T9	Interchange access plans would be prepared, in consultation with the Traffic and Transport Liaison Group and relevant authorities including Western Parkland City Authority , to ensure adequate pedestrian and cycle facilities and other transport interchange infrastructure is provided at each station precinct, in consultation with relevant authorities including Western Parkland City Authority	All Off-airport
OT2 T10	The project would be designed such that access to properties and existing infrastructure neighbouring the proposed stations would be maintained	All Off-airport
OT3 T11	Consultation and coordination would be undertaken with Transport for NSW through the Traffic and Transport Liaison Group to align proposed planned road and intersection upgrades with the year of opening, to enable safe and efficient interchanges between transport modes	All Off-airport

Ref	Mitigation measures	Applicable location(s)
OT4	An operational car parking strategy for St Marys would be prepared in consultation with Penrith City Council and Transport for NSW prior to commencement of operation. The strategy would include consideration of measures that could be implemented to address any parking impacts as a result of the project	St Marys
Noise and vibration – construction		
NV1	Where acoustic sheds are installed, the internal lining and type of material used in the construction of the sheds would be considered during design development and construction planning to ensure appropriate attenuation is provided	St Marys construction site Claremont Meadows services facility construction site Orchard Hills construction site Western Sydney International tunnel portal construction site Airport Terminal construction site Bringelly services facility construction site Aerotropolis Core construction site
NV2	To avoid potential vibration impacts to the Warragamba to Prospect Water Supply Pipelines, a detailed construction vibration assessment would be undertaken in accordance with the <i>Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines</i> (WaterNSW, 2020) and would consider the following requirements: <ul style="list-style-type: none"> • confirm velocity limits for construction activities and the impact the works will have on WaterNSW assets • excavation methods would be undertaken in accordance with German Standard DIN 4150-3:2016 (2.5 mm/s PPV) • vibration monitoring would be undertaken prior to and during construction for high risk construction activities • vibration monitoring reports would be provided to WaterNSW 	Off-airport construction corridor

Ref	Mitigation measures	Applicable location(s)
Noise and vibration – operation		
ONV1 NV3	<p>An Operational Noise and Vibration Review would be prepared during design development to confirm the mitigation measures required to manage:</p> <ul style="list-style-type: none"> airborne and ground-borne noise impacts from rail operations airborne noise impacts from the stabling and maintenance facility airborne noise impacts from fixed industrial sources, including stations and services facilities <p>The Operational Noise and Vibration Review would consider existing and potential future land use to establish Project Noise Trigger Levels.</p> <p>The EPA would be consulted during preparation of the Operational Noise and Vibration Review</p>	All Off-airport
Biodiversity – construction		
FF1	<p>The Biodiversity Construction Environmental Management Plan (on-airport) and Flora and Fauna Management Plan (off-airport) would be prepared by a suitably qualified and experienced person to minimise and manage the clearing of native vegetation and habitat by:</p> <ul style="list-style-type: none"> seeking to locate site offices, site compounds and ancillary facilities in areas where there are limited biodiversity values (e.g. cleared land) delaying the removal of vegetation until absolutely necessary avoiding the removal of hollow-bearing trees, where possible using a qualified surveyor and suitably qualified ecologist to mark out exclusion zones and clearing/project boundaries prior to construction providing contractors with regularly updated sensitive area maps (showing clearing boundaries and exclusion zones) investigating opportunities for salvage and storage of felled native trees for potential use in landscape design <p>The Biodiversity Construction Environmental Management Plan (on-airport) and Flora and Fauna Management Plan (off-airport) would be implemented throughout construction</p>	Orchard Hills construction site Off-airport construction corridor Stabling and maintenance facility construction site Luddenham Road construction site Airport construction support site Bringelly services facility construction site Aerotropolis Core construction site
FF2	<p>A Nest Box Strategy would be prepared to minimise habitat loss to hollow-dependent fauna in accordance with the Flora and Fauna Management Plan and would include the following requirements:</p> <ul style="list-style-type: none"> hollow-bearing trees would be marked/tagged and mapped prior to their removal. The size, type, number and location of nest boxes required would be based on the results of the pre-clearing survey about 70 per cent of nest boxes would be installed about one month prior to any vegetation removal to provide alternate habitat for hollow-dependent fauna displaced during clearing 	Claremont Meadows services facility construction site Off-airport construction corridor

Ref	Mitigation measures	Applicable location(s)
		Airport construction support site
FF3	Works on-airport would be undertaken in accordance with the nest box strategy included in the Western Sydney Airport Habitat Management sub-plan and consultation with Western Sydney Airport subject to the wildlife hazard management requirements	On-airport
FF4	<p>A targeted microbat survey (including Eastern Coastal Free-tailed Bat, Large Bent-winged bat and or Eastern False Pipistrelle) of dwellings and structures proposed for demolition, removal or modification would be undertaken in accordance with 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018) prior to disturbance</p> <p>Other Hhuman-made structures such as culverts and other under-road structures within the construction footprint would be surveyed for threatened microbats (e.g. particularly the Southern Myotis) in accordance with the Biodiversity Assessment Method (OEH, 2018). If threatened microbats are detected, a Microbat Management Plan would be developed as part of the Flora and Fauna Biodiversity Construction Management Plan and implemented by a suitably qualified bat specialist</p>	<p>Claremont Meadows services facility construction site</p> <p>Off-airport construction corridor</p> <p>Airport construction support site</p>
FF5	Works on-airport would be managed in accordance with the <i>Western Sydney Airport Microbat Management Plan</i> and in consultation with Western Sydney Airport	On-airport
FF6	During construction, shading and artificial light impacts would be minimised in areas adjoining remnant bushland that is in intact condition	<p>Claremont Meadows services facility construction site</p> <p>Orchard Hills construction site</p> <p>Off-airport construction corridor</p> <p>On-airport construction support site</p>
FF7	Fish passage and fish habitat associated with Cosgrove Creek and Blaxland Creek would be protected in accordance with the <i>Policy and Guidelines for Fish Habitat Conservation and Management</i> (DPI (Fisheries NSW), 2013)	Off-airport construction corridor
FF8	A Dewatering Plan would be prepared and implemented for the dewatering of rural dams which are impacted as a result of the construction of the project. This would include measures to manage the transfer of native aquatic fauna, if required, prior to dewatering and removing of dams	Off-airport
FF9	A Dewatering Plan would be prepared and implemented for the dewatering of rural dams which are impacted as a result of the construction of the project. This would include measures to manage the transfer of native aquatic fauna, if required, prior to dewatering and removing of dams. The plan would be consistent	On-airport

Ref	Mitigation measures	Applicable location(s)
	with the <i>Western Sydney Airport Biodiversity Construction Environmental Management Plan (on-airport)</i>	
FF10	<p>The impact of Key Threatening Processes as a result of the project would be managed and minimised where possible through:</p> <ul style="list-style-type: none"> • implementation of weed management measures to prevent the introduction and spread of weeds including exotic vines and scramblers, <i>Olea europaea</i> (African Olive), <i>Chrysanthemoides monilifera</i>, <i>Lantana camara</i>, and exotic perennial grasses • implementation of pathogen management measures to prevent the introduction and spread of pathogens including amphibian chytrid, <i>Phytophthora implementa</i>, and Exotic Rust Fungi of the order Pucciniales • implementation of management measures to protect the riparian zone to ensure fish passage and protect fish habitat in accordance with the <i>Policy and Guidelines for Fish Habitat Conservation and Management</i> (DPI (Fisheries NSW), 2013), and minimisation of vegetation removal within the riparian zone where possible 	All
FF11	A native vegetation seed collection and salvage program would be developed prior to the commencement of construction and implemented during construction. The seed collection and salvage program would target native species prioritising the Cumberland Plain Woodland species to be utilised in landscaping for the project where possible. Opportunities for use of collected and salvaged seed outside of the project would also be investigated	All
Biodiversity – operation		
OFF1 FF8	<p>Wildlife connectivity would be maintained (where possible) through the installation of viaduct/bridge structures designed in accordance with the following:</p> <ul style="list-style-type: none"> • height and width of the area under a bridge to be maximised for all species, noting a minimum height of approximately 3 metres of dry passage will provide connectivity for most terrestrial species • bridges wide enough to encompass water flow, stream bank and riparian vegetation, preferably on both sides of the watercourse • for small and medium sized mammals, provide fauna furniture as shelter (e.g. vegetation, logs, rocks, leaf-litter, refuge pipes, escape poles, roofing tiles, and roofing iron) • height and carriageway separation designed to allow sufficient light and moisture to enhance growth of vegetation under the structure • if used for multiple purposes (e.g. pathways or access roads) aim to provide the 3 metre of natural passage for fauna • relocation or adjustment of the stream bed avoided where possible • the structure to tie in with the natural hydrology of the surrounding habitat such that the width, depth and gradient of the watercourse are maintained in the structure • consistent with the <i>Policy and Guidelines for Fish Friendly Waterway Crossings</i> (DPI (Fisheries NSW), 2013) 	Off-airport
OFF2	<p>The design of viaduct structures over the wildlife/riparian corridors at Blaxland Creek, the unnamed tributary south of Patons Lane and Cosgroves Creek would seek to:</p> <ul style="list-style-type: none"> • maximise the span over the wildlife/riparian corridor • minimise native vegetation removal within the wildlife/riparian corridors • maintain opportunities for fauna movement along the wildlife/riparian corridors and 	Off-airport

Ref	Mitigation measures	Applicable location(s)
	<ul style="list-style-type: none"> provide opportunities to enhance fauna movement where possible 	
Non-Aboriginal heritage – construction		
NAH1	<p>Potential moveable heritage items would be identified and assessed and a significant fabric salvage schedule would be prepared by an appropriately qualified and experienced heritage specialist for St Marys Railway Station, Bringelly RAAF Base, McGarvie-Smith Farm, and McMasters Farm and Kennett's Airfield. Significant fabric would only be salvaged if it can be salvaged in such a way that it can be reused and is likely to be able to be reused</p>	<p>St Marys construction site</p> <p>Off-airport construction corridor</p> <p>Aerotropolis Core construction site</p>
NAH2	<p>Heritage advice would be sought to develop solutions to manage potential ground movement impacts to the St Marys Goods Shed</p>	<p>St Marys construction site</p>
NAH3	<p>Archival recording of heritage items which would be impacted or that would have their setting altered, would be carried out in accordance with the NSW Heritage Office's <i>Photographic Recording of Heritage Items Using Film or Digital Capture</i> (2006). The following items would be archivally recorded:</p> <ul style="list-style-type: none"> St Marys Railway Station Kennett's Airfield Luddenham Road Alignment McMaster Farm McGarvie-Smith Farm Kelvin Park Group (the State Heritage listed curtilage) Bringelly RAAF Base 	<p>St Marys construction site</p> <p>Off-airport construction corridor</p> <p>Luddenham Road construction site</p> <p>Aerotropolis Core construction site</p>
NAH4	<p>Not used</p> <p>Kennett's Airfield will be physically investigated during later investigation phases of the project to confirm heritage significance through an assessment of significance. Appropriate management and mitigation measures would then be determined</p>	<p>Off-airport construction corridor</p>
NAH5	<p>Archaeological investigation would be conducted for archaeological sites that would be impacted by the project. A non-Aboriginal Archaeological Research Design would be prepared for the project which would outline further archaeological investigation required for the project. Archaeological investigations would be undertaken in accordance with recommendations in the non-Aboriginal Archaeological Research Design</p>	<p>St Marys construction site</p>
NAH6	<p>The following heritage items would be monitored for potential vibration impacts during construction works:</p> <ul style="list-style-type: none"> St Marys Railway Station Group Queen Street Post-War Commercial Building St Marys Munitions Workers Housing McGarvie Smith Farm McMaster Farm 	<p>St Marys construction site</p> <p>Off-airport construction corridor</p>

Ref	Mitigation measures	Applicable location(s)
NAH7	If required, t The St Marys Station jib crane would be temporarily relocated prior to construction commencing in the vicinity of that may impact on this item, safely stored and appropriately maintained and conserved before reinstatement reinstated . If relocation is required, a detailed methodology for the removal and reinstatement of the jib crane would be prepared in consultation with an appropriately qualified heritage advisor	St Marys construction site
NAH8	A dilapidation survey of the Warragamba to Prospect Water Supply Pipelines would be undertaken prior to construction commencing in the vicinity of this item	Off-airport construction corridor
NAH9	If suspected human remains or unexpected items of potential heritage significance are discovered within the on-airport area, all activity would cease and the unexpected/chance finds requirements specified in the <i>Western Sydney Airport European and Other Heritage Construction Environmental Management Plan</i> would be followed	On-airport
Non-Aboriginal heritage – operation		
ONAH1 NAH10	Design development for the project would endeavour to minimise adverse impacts to heritage buildings, elements, fabric, and heritage significant settings and view lines that contribute to the overall heritage significance of heritage items	Off-airport
ONAH2 NAH11	The architectural design for the project would take account local heritage context and be sympathetic to local heritage character. This would include using sympathetic building materials, colours and finishes Design should aim to minimise visual impacts by ensuring that significant elements are not obstructed or overshadowed Design should adhere to the Sydney Metro – Western Sydney Airport Design Guidelines The Design Review Panel and Heritage Working Group would be consulted in regard to the design, form and material of new built structures that may impact heritage items	Off-airport
ONAH3 NAH12	Consultation with the Heritage Council and relevant stakeholders would occur for the design of works that have the potential to impact State significant items including for St Marys Railway Station and Kelvin/Kelvin Park Group	St Marys Station Aerotropolis Core Station
ONAH4 NAH13	A heritage interpretation strategy would be prepared for the project identifying key stories and interpretive opportunities related to non-Aboriginal heritage. The strategy would address historic and contemporary heritage and community values and would identify innovative and engaging opportunities for interpretation	Off-airport
ONAH5 NAH14	A conservation management plan would be prepared for St Marys Railway Station, in accordance with NSW Heritage Council guidelines. The plan would address any changes to the station, including updated assessment of significance of elements and recommendations on curtilage changes. It would also provide site specific exemptions and management policies	St Marys Station
ONAH6 NAH15	Heritage inventory registers for heritage items modified by the project would be updated to document their change in condition following the completion of construction works for the project	All Off-airport
ONAH7	An appropriately qualified and suitably experienced heritage architect would be engaged to provide input into design development at St Marys Station	St Marys Station

Ref	Mitigation measures	Applicable location(s)
Aboriginal heritage – construction		
AH1	<p>Aboriginal stakeholder consultation would continue to be carried out in accordance with the <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> (NSW Office of Environment and Heritage, 2010). Registered Aboriginal Parties would be provided with opportunities to participate in survey and testing in unverified areas of Aboriginal archaeological sensitivity, archaeological salvage works and unexpected find assessments (if required).</p> <p>participate in future site inspections and test excavations. Measures to manage and protect the identified cultural values would be developed collaboratively through this consultation process to inform design development and heritage interpretation</p>	Off-airport
AH2	<p>Areas of unverified Aboriginal archaeological sensitivity would be subject to archaeological survey, if required, and test excavation prior to construction in accordance with the Aboriginal Cultural Heritage Management Plan</p> <p>Survey would be undertaken, with Registered Aboriginal Parties, in the areas of archaeological sensitivity where field investigations have not already been completed or where ground surface visibility limited the effectiveness of past inspections. The surface areas above the tunnel alignment would also be ground truthed to ensure there are no site types directly above the tunnel that would be damaged by subsidence, with site specific mitigation measures to be developed where any are found to be present</p>	Off-airport
AH3	<p>Not used</p> <p>Test excavation would be undertaken in ground truthed areas of confirmed archaeological sensitivity, to determine the presence or absence of subsurface archaeological deposits, where project impacts are anticipated</p>	Off-airport
AH4	<p>Not used</p> <p>Following the test excavation program, an Aboriginal Cultural Heritage Management Plan would be prepared. The Aboriginal Cultural Heritage Management Plan would identify management actions including conservation, protection and mitigation, and would authorise harm where appropriate and provide further detail in relation to salvage excavation program if required</p>	Off-airport
AH5	<p>All Aboriginal objects recovered from the construction footprint as a result of test excavation and salvage works would be appropriately secured and under the care of the archaeological consultant while options for their long-term management, as determined through consultation with Registered Aboriginal Parties, are being investigated</p> <p>The temporary repository of any retrieved artefacts would be appropriately secured and under the care of the archaeological consultant</p> <p>If retrieved, further consultation with Registered Aboriginal Parties would be required to determine the preferred long term care and management of any retrieved Aboriginal artefacts</p>	Off-airport

Ref	Mitigation measures	Applicable location(s)
AH6	Aboriginal Heritage Information Management System site cards would be produced for all newly identified sites other than those identified on Commonwealth land. and These should be submitted to the Aboriginal Heritage Information Management System Registrar as soon as practicable within one month of being identified. Newly identified sites within the revised boundaries of Defence Establishment Orchard Hills (Commonwealth land) would be reported to the Department of Defence to be managed in accordance with the relevant provisions of the <i>Defence Establishment Orchard Hills Heritage Management Plan</i>	Off-airport
AH7	Aboriginal Site Impact Recording forms for sites subject to archaeological salvage would be submitted to the Aboriginal Heritage Information Management System register within one month of the completion of salvage works within their bounds for all Aboriginal Heritage Information Management System registered Aboriginal sites that are impacted by the project	Off-airport
AH8	If any suspected human remains or unexpected Aboriginal cultural heritage objects are discovered within the on-airport area, all activity would cease and the unexpected finds protocol and discovery of human remains protocol specified in the <i>Western Sydney Airport Aboriginal Cultural Heritage Construction Environmental Management Plan</i> would be followed	On-airport
AH9	Works within the bounds of existing Aboriginal Heritage Impact Permit areas should be undertaken in accordance with the conditions of those permits and with permission from the relevant Aboriginal Heritage Impact Permit holder. Works undertaken within the revised boundaries on Defence Establishment Orchard Hills (Commonwealth land) should be undertaken in accordance with the <i>Defence Establishment Orchard Hills Heritage Management Plan</i>	Off-airport
AH10	Impacted Aboriginal Sites would be managed in accordance with the Aboriginal Cultural Heritage Management Plan	Off-airport
AH11	Measures would be implemented to ensure that Aboriginal sites located outside of the construction footprint, but within 100m of it, would not be affected by construction activities	Off-airport
AH12	An Archaeological Salvage Report detailing the results of the archaeological salvage program (including the results of any post-excavation analyses) would be completed within two years of the completion of the fieldwork component of the program. The Archaeological Salvage Report would be consistent with the best practice guidelines suggested by the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW</i> (DECCW 2010) and the <i>Aboriginal Cultural Heritage Standards & Guidelines Kit</i> (NSW NPWS 1997)	Off-airport
AH13	Measures to manage and protect the identified cultural values would be developed collaboratively through a consultation process with knowledge holders to inform construction planning and design development	Off-airport
Aboriginal heritage – operation		
OAH1	A heritage interpretation strategy would be prepared for the project in consultation with Aboriginal knowledge holders. Aboriginal heritage interpretation would be developed with reference to the findings of the Aboriginal Cultural Heritage Assessment Report and Aboriginal Archaeological Report, to promote understanding and awareness of cultural heritage values	All

Ref	Mitigation measures	Applicable location(s)
Flooding, hydrology and water quality – construction		
HYD1	<p>Construction planning would consider flood related mitigation, including:</p> <ul style="list-style-type: none"> staging construction works to reduce the duration of works within the floodplain daily and continuous monitoring of weather forecasts and storm events, rainfall levels and water levels in key watercourses to identify potential flooding events and related flood emergency response consultation with NSW State Emergency Services and relevant local councils to ensure consistent approaches to the management of flood events (off-airport only) provide flood-proofing to excavations at risk of flooding during construction, where reasonable and feasible, such as raised entry into shafts and/or pump-out facilities to minimise ingress of floodwaters into shafts and the dive structure review of site layout and staging of construction works to avoid or minimise obstruction of overland flow paths and limit the extent of flow diversion required 	<p>Orchard Hills construction site</p> <p>Off-airport construction corridor</p> <p>On-airport construction corridor</p> <p>Airport construction support site</p>
HYD2	<p>Minimise works in the main creek channels (at Blaxland Creek, unnamed watercourse south of Patons Lane and Cosgroves Creek) where possible and avoid works in the channel during rainfall events</p>	<p>Off-airport construction corridor</p>
HYD3	<p>Surface water flows during construction would be managed to ensure that there is no increase in flows into or through the Warragamba to Prospect Water Supply Pipelines corridor</p>	<p>Off-airport construction corridor</p>
WQ1	<p>A surface water quality monitoring program would be implemented to monitor water quality during construction. The program would be developed in consultation with (as relevant) Western Sydney Airport, NSW Environment Protection Authority, relevant sections of Department of Planning, Industry and Environment and relevant local councils. The program would consider monitoring being undertaken as part of other infrastructure projects such as the M12 Motorway and Western Sydney International</p> <p>On-airport, the water quality monitoring program would ensure that works meet the requirements under Schedule 2 of the Airports (Environment Protection) Regulations 1997</p> <p>The program would monitor all construction discharge locations including South Creek at St Marys, South Creek at the M4 Western Motorway, South Creek at Longleys Road, Cosgroves Creek at Twin Creeks Drive, Thompsons Creek and Badgerys Creek at Elizabeth Drive</p>	<p>Claremont Meadows services facility construction site</p> <p>Orchard Hills construction site</p> <p>Off-airport construction corridor</p> <p>Airport construction support site</p> <p>Airport Terminal construction site</p> <p>On-airport construction corridor</p> <p>Bringelly services facility construction site</p> <p>All</p>

Ref	Mitigation measures	Applicable location(s)
WQ2	Water treatment plants would be designed to ensure that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default guidelines for 95 per cent species protection and 99 per cent species protection level for toxicants that bioaccumulate unless other discharge criteria are agreed with relevant authorities	All
WQ3	The design and construction of the project would take into account the former NSW Office of Water's Guidelines for controlled activities on waterfront land	Off-airport
Flooding, hydrology and water quality – operation		
OHYD1 HYD3	The flood model for the project would be updated with regard to flood modelling undertaken for the South Creek Sector Review (anticipated to be released in 2020 ¹) and would include updated calibration and validation. The updated flood modelling would be used to inform design development including but not limited to, addressing potential residual flood impacts identified at the following locations: <ul style="list-style-type: none"> the viaduct and earthworks in the vicinity of Blaxland Creek so as to minimise the extent of the project within the floodplain the earthworks arrangement at the stabling and maintenance facility in the area affected by the Probable Maximum Flood The flood model for the project would be updated in consultation with relevant stakeholders	All
OHYD2 HYD4	Develop localised stormwater management plans at St Marys Station and Aerotropolis Core Station to ensure these stations are protected from localised flooding	St Marys Station Aerotropolis Core Station
OHYD3 HYD5	Flood compatible design would need to be demonstrated for the permanent spoil placement areas to ensure compliance with applicable land use criteria	On-airport
OHYD4	The design of the viaduct crossing over the Warragamba to Prospect Water Supply Pipelines would not result in an increase of overland flows into or through the pipelines corridor for each storm event up to and including the 1% AEP event	Off-airport
OWQ1 WQ2	Design batter slope gradients and surface treatments to minimise erosion risk	All
OWQ2 WQ3	Drainage and water treatment design to be undertaken in accordance with Water Sensitive Urban Design requirements specified in local council, Transport for NSW and on-airport standards	All
OWQ3 WQ4	Suitably designed scour and erosion controls should be included at drainage and sedimentation basin outlet discharge points	All
OWQ4 WQ5	Detailed design of viaducts across waterways would aim to minimise infrastructure within the bed and banks of existing waterways and minimise changes to flood behaviour across the floodplain	Off-airport All
OWQ5 WQ6	Where feasible, on-site detention of stormwater would be introduced where stormwater runoff rates are increased. Where there is insufficient space for the provision of on-site detention, the upgrade of downstream infrastructure would be implemented where feasible and reasonable	All
OWQ6 WQ7	At all locations where stormwater is discharged, water quality measures such as gross pollutant traps, bio-retention swales and Water Sensitive Urban Design features would be investigated and implemented where feasible and reasonable	All

Ref	Mitigation measures	Applicable location(s)
OWQ7 WQ8	<p>Water quality monitoring of all discharges from water quality treatment plants to be undertaken to contribute towards achievement of the ANZECC guideline water quality trigger values</p> <p>Water treatment plants would be designed to ensure that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default guidelines for 95 per cent species protection and 99 per cent species protection level for toxicants that bioaccumulate unless other discharge criteria are agreed with relevant authorities</p>	<p>St Marys Station</p> <p>Bringelly services facility</p>
Groundwater and geology – construction		
GW1	<p>Further assessment would be undertaken during design development, and prior to construction commencing, to ensure that damage to buildings and structures at risk of ground movement impacts around St Marys, Claremont Meadows, Orchard Hills and Bringelly are avoided or managed</p> <p>Where building damage risk is rated as slight, moderate or high (as per Rankin 1988), a structural assessment of the affected buildings/structures would be carried out and specific measures implemented to address the risk of damage</p>	<p>St Marys construction site</p> <p>Claremont Meadows services facility construction site</p> <p>Orchard Hills construction site</p> <p>Bringelly services facility construction site</p>
GW2	<p>Further assessment of road and rail infrastructure and utility assets (including the Warragamba to Prospect Water Supply Pipelines) considered to be at risk from ground movement would be undertaken during design development. Consultation would be undertaken with the infrastructure and asset owners in each case to determine appropriate ground movement criteria for the assessment and, if required, to agree management measures to manage potential impacts</p>	<p>St Marys construction site</p> <p>Claremont Meadows services facility construction site</p> <p>Orchard Hills construction site</p> <p>Off-airport construction corridor</p> <p>Bringelly services facility construction site</p>

Ref	Mitigation measures	Applicable location(s)
GW3	<p>Further assessment of potential ground movement impacts on the Goods Shed building at St Marys Station, including a building condition survey, would be carried out during design development and prior to the commencement of construction. The assessment would be carried out in consultation with a suitably qualified heritage architect and would identify acceptable ground movement criteria and, if required, feasible measures to reduce or mitigate the effects of ground movement on this structure</p> <p>Ground movement in the vicinity of the Goods Shed and the condition of the Goods Shed building would be monitored during construction A dilapidation survey of the Goods Shed would be carried out prior to work commencing in the vicinity of the building. At the completion of construction, should there be any damage to the building which is determined to be as a result of the project construction works, the building would be repaired in consultation with a suitably qualified heritage architect</p>	St Marys construction site
GW4	<p>Consultation with Western Sydney Airport will be on-going in respect to the construction programs for both projects to understand the potential for ground movement impacts to proposed buildings and structures</p>	On-airport
GW5	<p>Detailed hydrogeological and geotechnical models for the project would be developed and progressively updated during design and construction</p> <p>These models would:</p> <ul style="list-style-type: none"> • be informed by the results of groundwater monitoring undertaken before and during construction • identify predicted changes to groundwater levels, including at nearby water supply works and at groundwater dependent ecosystems or other sensitive groundwater receptors <p>Where changes to groundwater levels are predicted at nearby water supply works, groundwater dependent ecosystems or other sensitive groundwater receivers, an appropriate groundwater monitoring program would be developed and implemented</p> <p>Where changes to groundwater level are close to the ground surface, dryland salinity monitoring would be implemented to allow for management of any identified impacts</p> <p>The groundwater monitoring program would aim to confirm no adverse impacts on the receiver during construction or to effectively manage any impacts with the implementation of appropriate mitigation measures. Monitoring at any specific location would be subject to the status of the water supply work and agreement with the landowner</p>	All

Ref	Mitigation measures	Applicable location(s)
GW6	<p>A Groundwater Management Plan would be prepared and implemented. The plan must include the following trigger-action-response measures in relation to groundwater levels in areas identified as subject to potential drawdown (at groundwater dependent ecosystems or other sensitive receivers) but outside the construction footprint and Western Sydney International Stage 1 Construction Impact Zone:</p> <ol style="list-style-type: none"> target criteria, set with reference to relevant standards and site specific parameters; trigger values and corresponding corrective actions to prevent recurring or long-term exceedance of the target criteria described in (a); and corrective actions to compensate for any recurring or long-term exceedance of the target criteria described in (a) <p>Response measures may include:</p> <ul style="list-style-type: none"> targeted ground improvement and grouting to limit groundwater inflows into station excavations, tunnels and cross-passage to reduce groundwater drawdown design of undrained temporary retention systems to minimise groundwater inflow into station excavations and reduce groundwater drawdown supplementing groundwater supply at affected groundwater dependent ecosystems or watercourses make good provisions for groundwater supply wells impacted by changes in groundwater level or quality 	All
Groundwater and geology – operation		
OGW1 GW7	Ongoing groundwater inflows from drained project elements (or incidental flows) would be treated and tested before discharge to comply with any relevant Environment Protection Licence or agreed discharge criteria	St Marys Station Bringelly services facility
Soils and contamination – construction		
SC1	<p>The Soil and Water Management Plan would incorporate the following measures:</p> <ul style="list-style-type: none"> for low risk areas of environmental concern, worker health and safety measures, waste management and tracking for contamination would be outlined <p>for medium and high risk areas of environmental concern, detailed site inspections investigations and review of further available information would be undertaken prior to the start of construction</p>	All
SC2	<p>Based on outcomes of SC1:</p> <ul style="list-style-type: none"> if a medium or high risk area of environmental concern is reassessed as low risk, the site would be managed in accordance with the Soil and Water Management Plan. This would typically occur where there is minor, isolated contamination that can be readily remediated through standard construction practices such as excavation and off-site disposal for medium risk areas of environmental concern, for areas of environmental concern that remain or change to medium risk, if the risk for the areas of environmental concern remains medium, visual inspections and monitoring would be performed during earthworks. If suspected contamination is encountered, the materials would be subject to sampling and analysis to assess management requirements in accordance with statutory 	Off-airport

Ref	Mitigation measures	Applicable location(s)
	<p>guidelines made or endorsed by the NSW Environment Protection Authority statutory guidelines</p> <ul style="list-style-type: none"> for areas of environmental concern that remain or change to high risk, a Sampling, Analysis and Quality Plan would be prepared for Detailed Site Investigations or data gap investigations. The results from the site investigations would be assessed against criteria contained within the <i>National Environment Protection (Assessment of Site Contamination) Measure</i> (2013) and other applicable NSW statutory guidelines to assess whether remediation is required. Remediation works would be performed in accordance with the hierarchy of preferred strategies in the <i>Guidelines for the NSW Site Auditor Scheme</i> (NSW Environment Protection Authority, 2017) and other guidelines made or endorsed by the NSW Environment Protection Authority <p>Where practical, remediation works would be integrated with excavation and development works performed during construction</p>	
SC3	<p>Where information gathered from investigations for medium and high risk areas of environmental concern (as per mitigation measure SC1) is insufficient to determine the risk of contamination, a detailed site investigation would be carried out in accordance with the <i>National Environment Protection Measure</i> (2013) and other guidelines made or endorsed by the NSW Environment Protection Authority</p> <p>Where data from the additional data review (mitigation measure SC1) or the detailed site investigation (mitigation measure SC2) confirms that contamination would require remediation, a Remediation Action Plan would be developed for the area of the construction footprint</p> <p>If a Remediation Action Plan is required, it would be developed in accordance with NSW Environment Protection Authority statutory guidelines and a Site Auditor would be engaged. Remediation methodologies would be undertaken in accordance with Australian Standards and other relevant government guidelines and codes of practice</p> <p>Remediation would be performed as an integrated component of construction and to a standard commensurate with the proposed end use of the land</p>	Off-airport
SC4	<p>If a duty to report to the NSW Environment Protection Authority under Section 60 of the <i>Contaminated Lands Management Act 1997</i> is triggered, or where a medium to high risk of contamination is identified, an accredited Site Auditor would review and approve the Remediation Action Plan (including issue of interim audit advice), and would develop a Site Audit Statement and Site Audit Report upon completion of remediation</p>	Off-airport

Ref	Mitigation measures	Applicable location(s)
SC5	<p>An unexpected finds procedure would be developed and implemented as part of the project Soil and Water Management Plan, outlining a set of potential contamination issues which could be encountered, and detailing the corrective management actions to be implemented. The unexpected finds procedure would include a process for chemical and asbestos contamination and would generally include:</p> <ul style="list-style-type: none"> • cessation of works within the affected area until inspection of the suspected contamination by a qualified contaminated lands consultant (verification by a certified contaminated land practitioner) • collection of soil samples for chemical or asbestos analysis, where required, based on observations • assessment of results against applicable land use or waste classification criteria in accordance with statutory guidelines made or endorsed by the NSW Environment Protection Authority statutory guidelines • management of the contamination in accordance with statutory guidelines made or endorsed by the NSW Environment Protection Authority statutory guidelines • the unexpected finds procedure for on-airport construction would be consistent with the Western Sydney Airport unexpected finds procedure detailed in the Western Sydney Airport Soil and Water Construction Environmental Management Plan (Western Sydney Airport, 2019) 	All
SC6	<p>Post construction, an inspection of construction, stockpiling and laydown sites and soil validation of redundant sedimentation/water quality basins would be undertaken to assess if further investigation and remediation is required.</p> <p>Investigation and remediation (if required) would be undertaken in accordance with the Soil and Water Management Plan (off-airport) and a project specific Remediation Action Plan that would be prepared in a manner consistent with the <i>Western Sydney Airport Remediation Action Plan</i> (2019) (on-airport).</p> <p>All inspections, investigations and remediation would be undertaken by a qualified contaminated lands consultant with reports prepared or reviewed by a Certified Contaminated Land Consultant (verified by a certified contaminated land practitioner)</p>	All
SC7	<p>Prior to ground disturbance in areas of potential acid sulfate soil occurrence, testing would be carried out to determine the actual presence of acid sulfate soils. If acid sulfate soils are encountered, they would be managed in accordance with the <i>Acid Sulfate Soil Manual</i> (Acid Sulfate Soil Management Advisory Committee, 1998)</p>	All
SC8	<p>Prior to ground disturbance in high probability salinity areas testing would be carried out to determine the presence of saline soils. If salinity is encountered, excavated soils would not be reused or would be managed in accordance with <i>Book 4 Dryland Salinity: Productive Use of Saline Land and Water</i> (NSW DECC 2008). Erosion controls would be implemented in accordance with the <i>Managing Urban Stormwater: Soils and Construction Volume 1</i> (Landcom, 2004)</p>	All
SC9	<p>Targeted groundwater investigations would be undertaken prior to construction to identify high salinity areas at risk from rising groundwater. Where high saline areas (>1000 µS/cm) are identified, measures such as planting, regenerating and maintaining native vegetation and good ground cover in recharge, transmission and discharge zones would be implemented where possible</p>	All

Ref	Mitigation measures	Applicable location(s)
SC10	Where the construction footprint is not used as part of the operational footprint (residual land), an assessment of the suitability of the site suitability assessment for the proposed land use would be undertaken in accordance with statutory guidelines made or endorsed by the NSW Environment Protection Authority statutory guidelines	Off-airport
SC11	For works within Western Sydney International: <ul style="list-style-type: none"> a review of further available information from Western Sydney Airport would be undertaken prior to the commencement of construction, which may include review of investigations, the <i>Western Sydney Airport Remediation Action Plan</i> and validation reports any remediation works (for contamination encountered by Sydney Metro that has not been remediated by Western Sydney Airport) would be undertaken in accordance with the Sydney Metro Remediation Action Plan, developed in a manner consistent with the <i>Western Sydney Airport Remediation Action Plan</i> (Department of Infrastructure and Regional Development, 2019) to the extent practicable 	On-airport
Sustainability, climate change and greenhouse gas – construction		
SUS1	A Sustainability Plan would be developed to be consistent with the Western Sydney Airport Sustainability Plan, and would be implemented during construction of the project. It would inform the preparation of Sustainability Management Plans A Sustainability Plan would be developed and implemented during construction of the project. The Sustainability Plan would identify the sustainability, climate change and greenhouse gas objectives, initiatives and targets which would be implemented during further design development and construction of the project. The Sustainability Plan would be developed to be consistent with the <i>Western Sydney Airport Sustainability Plan</i> for on-airport works. The Sustainability Plan would also inform the preparation of Sustainability Management Plans for each off-airport construction work package	All
SUS2	Protect sensitive construction equipment from the effects of extreme weather and climate , such as direct exposure to the sun on extreme heat days and flooding	All
SUS3	Address climate change impacts in emergency management procedures for the construction of the project, such as consideration of impacts of flash flooding on evacuation procedures	All
GHG1	Carry out an iterative process of greenhouse gas assessments and design refinement prior to construction to identify opportunities to minimise greenhouse gas emissions Performance would be measured in terms of a percentage reduction in greenhouse gas emissions, and assessed against a business as usual project benchmark verified by Infrastructure Sustainability Council of Australia or equivalent independent industry body baseline inventory calculated at the design development and construction planning stage	All

Ref	Mitigation measures	Applicable location(s)
Sustainability, climate change and greenhouse gas – operation		
OSUS1 SUS4	<p>A Sustainability Plan would be developed to be consistent with the Western Sydney Airport Sustainability Plan, and implemented during operation of the project</p> <p>A Sustainability Plan would be developed and implemented during operation of the project. The Sustainability Plan would identify the sustainability, climate change and greenhouse gas objectives, initiatives and targets which would be implemented during further design development and operation of the project. The Sustainability Plan would be developed to be consistent with the <i>Western Sydney Airport Sustainability Plan for on-airport works</i></p>	All
OSUS2 SUS5	Climate change risk treatments would be confirmed and incorporated during further design development	All
OGHG1 GHG2	<p>Carry out an iterative process of greenhouse gas assessments and design refinement during detailed design to identify opportunities to minimise greenhouse gas emissions</p> <p>Performance would be measured in terms of a percentage reduction in greenhouse gas emissions, and assessed against a business as usual project benchmark verified by Infrastructure Sustainability Council of Australia or equivalent independent industry body baseline inventory calculated at the design development stage</p>	All
Resource management – construction		
WR1	Construction waste would be minimised by accurately calculating materials brought to the site and limiting materials packaging	All
WR2	Waste streams would be segregated to avoid cross-contamination of materials and maximise reuse and recycling opportunities	All
WR3	A materials tracking system would be implemented for material transferred between construction sites	All
Resource management – operation		
OWR1 WR4	<p>Generation of waste would be minimised and reused where possible in line with the waste hierarchy and the sustainability objectives outlined in a Sustainability Plan. In addition:</p> <ul style="list-style-type: none"> bins would be provided for general waste and recyclables and collection would be undertaken by an authorised contractor for off-site recycling or disposal at a licenced waste facility waste from maintenance activities, including containers holding grease and lubricants, would be stored in designated areas for collection by an authorised contractor for off-site disposal containers holding grease and lubricants for maintenance would be washed prior to disposal or stored separately for disposal as hazardous waste waste oil and oil filters would be stored in recycling bins and collected by an authorised contractor, and recycled off-site, where feasible wastewater, sewage and grey water would be disposed to stormwater, sewer, recycled wastewater system or transported to an appropriately licenced liquid waste treatment facility (if water quality does not meet requirements for discharge to the stormwater/sewer system) 	All
Land use and property – construction		
LU1	Areas of land leased for the purposes of construction would be reinstated at the end of the lease to at least equivalent standard in consultation with the landowner	All Off-airport

Ref	Mitigation measures	Applicable location(s)
LU2	Where required property adjustments have the potential to impact farm infrastructure (such as fencing or dams) or local access to properties, consultation with affected property owners would be carried out prior to these works occurring, in order to determine reasonable, feasible and acceptable solutions with affected property owners	All Off-airport
LU3	Where a property would be potentially fragmented by the construction corridor, access to properties would be maintained, in consultation with the landowner(s)	Off-airport construction corridor
Land use and property – operation		
OLU1	Where a property would be potentially fragmented by the rail corridor, access to properties would be provided. The location of access to be provided would be agreed in consultation with the landowner(s)	Off-airport
OLU2	Sydney Metro would continue to consult with key stakeholders during design development of the station interchanges and precincts	Off-airport
Landscape and visual – construction		
LV1	Opportunities for the retention and protection of existing street trees and trees within the construction sites would be identified during detailed construction planning	Off-airport
LV2	Existing trees to be retained would be protected prior to the commencement of construction in the vicinity of these trees in accordance with AS4970-2009 Protection of Trees on Development Sites	All
LV3	All structures (including potential acoustic sheds, site offices, workshop sheds and site hoarding) would be finished in a colour which aims to minimise their visual impact where appropriate. This finish is to be applied to all visible fixtures and fittings (such as exposed downpipes)	All
Landscape and visual – operation		
OLV1 LV4	The landscape design for the project would include consideration of appropriate species lists to minimise opportunities to attract wildlife at levels likely to present a hazard to aviation operations. The landscape design would have regard to relevant requirements and species lists under the <i>Western Sydney Airport's Wildlife Management Plan</i> and other relevant guidelines, including the <i>National Airports Safeguarding Framework (Guideline C): Managing the Risk of Wildlife Strikes in the Vicinity of Airports (Australian Government, 2014)</i> and <i>Recommended Practices No. 1 – Standards for Aerodrome Bird/Wildlife Control (International Birdstrike Committee 2006)</i>	All
OLV2 LV5	Lighting at stations would be designed and operated in accordance with AS4282- 2019 Control of the obtrusive effects of outdoor lighting and the <i>National Airports Safeguarding Framework Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports (Australian Government, 2014)</i> (where relevant)	All
OLV3 LV6	Opportunities to provide vegetation screening of the stabling and maintenance facility (from sensitive receivers such as Luddenham Road and the surrounding rural areas within the viewshed) would be investigated during design development. This would include investigating options for establishing screening vegetation as early in the construction phase as possible	Stabling and maintenance facility

Ref	Mitigation measures	Applicable location(s)
OLV4 LV7	Landscape screening would be provided along the corridor including restoring vegetation along the creeks to contain local views, in accordance with the Sydney Metro – Western Sydney Airport Design Guidelines, to minimise adverse visual impacts where feasible	All
OLV5 LV8	Corridor services, including the combined services route would be designed to reduce visual clutter and minimise visual impact ensuring these structures have a low profile and do not obstruct views across the corridor	All
OLV6 LV9	Proposed engineering batters and water management measures would be designed to integrate with the existing landforms and natural features	All
OLV7	<p>The landscape design for the project would:</p> <ul style="list-style-type: none"> incorporate salvaged native trees (including tree hollows and root balls), to enhance fauna habitat in suitable locations, including riparian corridors, where practicable use native species from the relevant native vegetation communities within the local area for tree planting programs 	All
Social and economic – construction		
SE1	<p>Consultation with the local community and project stakeholders would be undertaken to:</p> <ul style="list-style-type: none"> identify and deliver opportunities for facilitating local creative and cultural activities in appropriate project locations identify and deliver initiatives and opportunities to provide a positive contribution to the potentially affected community and affected locations such as temporary public art and targeted community events and programs 	Off-airport
SE2	<p>Not used</p> <p>Consultation with Penrith City Council and Transport for NSW would be undertaken to identify opportunities to minimise impacts to on-street and off-street car parking at St Marys during construction for alternative commuter car parking around St Marys if the planned expansion of the multi-level commuter car park does not proceed</p>	St Marys construction site
SE3	Where partial property acquisition has been identified, undertake property liaison and consultation activities to minimise disruption to property owners and activities on impacted sites	Off-airport
Air quality – construction		
AQ1	<p>The Air Quality Management Plan for the project would incorporate the following best-practice odour management measures which would be implemented as appropriate during relevant construction works:</p> <ul style="list-style-type: none"> the extent of opened and disturbed contaminated soil at any given time would be minimised temporary coverings or odour suppressing agents would be applied to excavated areas where appropriate regular odour monitoring would be conducted during excavation to verify that no offensive odours are being generated 	All
AQ2	Where acoustic sheds are proposed these would be designed and managed to prevent/minimise the escape of dust emissions	All
AQ3	Air quality monitoring, consistent with the <i>Western Sydney Airport Air Quality Construction Environmental Management Plan</i> would be carried out during construction to ensure that works meet the requirements under Schedule 1 of the Airports (Environment Protection) Regulations 1997	On-airport

Ref	Mitigation measures	Applicable location(s)
Hazard and risk – construction		
HR1	All hazardous substances that may be required for construction would be stored and managed in accordance with the <i>Storage and Handling of Dangerous Goods Code of Practice</i> (WorkCover NSW, 2005), the <i>Hazardous and Offensive Development Application Guidelines: Applying SEPP 33</i> (Department of Planning, Industry and Environment, 2011) the <i>Work Health and Safety Act 2011</i> (Commonwealth and NSW) and the requirements of the <i>Environmentally Hazardous Chemicals Act 1985</i> (NSW)	All
HR2	A Bushfire Management Plan would be prepared and implemented to manage current bushfire risk and identify response actions during construction of the project. The Plan would be prepared in consultation with the NSW Rural Fire Service and Western Sydney Airport. For project areas within Western Sydney International the Plan would be prepared having regard to the existing <i>Western Sydney Airport Site at Badgerys Creek Bushfire Risk Management Plan</i> (Western Sydney Airport Corporation, 2019)	All
HR3	A hazardous materials analysis would be carried out prior to stripping and demolition of structures and buildings which are suspected of containing hazardous materials (particularly asbestos) Hazardous materials and special waste (such as asbestos) would be removed and disposed of in accordance with the relevant legislation, codes of practice and Australian Standards (including the Work Health and Safety and Regulation 2011 (NSW))	All
HR4	Where the project crosses or is adjacent to the Warragamba to Prospect Water Supply Pipelines, cConstruction planning, and approaches to minimising minimise risks of damage or rupture to of the Warragamba to Prospect Water Supply Pipelines, would be developed in consultation with WaterNSW, and in accordance with the <i>Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines</i> (Water NSW, 2020)	Off-airport construction corridor
Hazard and risk – operation		
OHR1 HR5	All hazardous substances that may be required for operation would be stored and managed in accordance with the <i>Storage and Handling of Dangerous Goods Code of Practice</i> (WorkCover NSW, 2005), the <i>Hazardous and Offensive Development Application Guidelines: Applying SEPP 33</i> (Department of Planning, Industry and Environment, 2011), the <i>Work Health and Safety Act 2011</i> (Commonwealth and NSW) and the requirements of the <i>Environmentally Hazardous Chemicals Act 1985</i> (NSW)	All
OHR2 HR6	A Bushfire Management Plan would be prepared and implemented to manage current bushfire risk and identify response actions during operation of the project. The Plan would be prepared in consultation with the NSW Rural Fire Service and Western Sydney Airport. For project areas within Western Sydney International the Plan would be prepared having regard to the existing <i>Western Sydney Airport Site at Badgerys Creek Bushfire Risk Management Plan</i> (Western Sydney Airport Corporation, 2019)	All
OHR3 HR7	Where the project crosses or is adjacent to the Warragamba to Prospect Water Supply Pipelines, the design of the project would aim to minimise risks of damage or rupture of the Warragamba to Prospect Water Supply Pipelines in consultation with WaterNSW, and in accordance with the <i>Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines</i> (Water NSW, 2020)	Off-airport construction corridor

Ref	Mitigation measures	Applicable location(s)
OHR4 HR8	The project would be designed to avoid pilot distraction and minimise the risk of headlight glare from metro trains where on surface rail alignment. This would include providing glare screens in those locations where the project creates an unacceptable risk of pilot distraction	All
Cumulative impacts – construction		
CL1	<p>A Cumulative Construction Impacts Management Plan would be developed and would detail co-ordination and consultation requirements with the following stakeholders (as relevant) to manage the interface of projects under construction at the same time:</p> <ul style="list-style-type: none"> • Western Sydney Airport • Transport for NSW • Western Parkland City Authority • Sydney Water • Emergency service providers • Utility providers <p>Co-ordination and consultation requirements with these stakeholders would be detailed in the plan to include:</p> <ul style="list-style-type: none"> • provision of regular updates to the detailed construction program, construction sites and haul routes • identification of key interfaces with other construction projects • development of mitigation strategies to manage cumulative impacts associated with these interfaces 	All

8 Conclusion and next steps

This chapter provides a conclusion to the Submissions Report and outlines the next steps in the approvals process.

The Sydney Metro – Western Sydney Airport Environmental Impact Statement was placed on exhibition for a period of six weeks from 21 October to 2 December 2020. During the exhibition period, submissions were received from the community and other stakeholders. The receipt of submissions was coordinated and managed by the Department of Planning, Industry and Environment.

A total of 40 submissions were received by the Department of Planning, Industry and Environment in response to the Environmental Impact Statement, consisting of 25 community submissions and 15 NSW Government agency (including local councils) and other key stakeholder submissions. Of these submissions, nine supported the project, six objected to the project and 25 submissions did not offer a position and were categorised as providing comments.

This Submissions Report presents responses to issues raised in submissions received during the exhibition of the Environmental Impact Statement. It also presents clarifications to information presented in the Environmental Impact Statement including an assessment of potential environmental impacts of those clarifications. It also includes details of additional biodiversity, Aboriginal heritage and non-Aboriginal heritage fieldwork carried out since public exhibition of the Environmental Impact Statement.

The Department of Planning, Industry and Environment will review the Environmental Impact Statement, submissions received and this Submissions Report.

Once the Department of Planning, Industry and Environment has completed its assessment, a draft Environmental Assessment Report would be prepared for the Secretary of the Department of Planning, Industry and Environment, which may include recommended conditions of approval for the parts of the project that are subject to the EP&A Act. The Environmental Assessment Report would then be provided to the Minister for Planning and Public Spaces.

The Minister for Planning and Public Spaces would then decide whether or not to approve the State significant infrastructure project and identify any conditions of approval that would apply under the NSW planning regime. The Minister's determination, including any conditions of approval and the Environmental Assessment Report, would be published on the Department of Planning, Industry and Environment Major Projects website.

Sydney Metro would continue to consult with community members, government agencies and other stakeholders during construction to minimise potential impacts on the environment and the community.

9 References and glossary

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Glossary

Terms

Term	Definition
Aboriginal object	Any deposit, object or material evidence (not being a handicraft made for sale), including Aboriginal remains, relating to the Aboriginal habitation of NSW.
Aboriginal place	Any place declared to be an Aboriginal place under section 94 of the <i>NSW National Parks and Wildlife Act 1974</i> .
AM peak hour	Unless otherwise stated, this refers to trips travelling on the network during the average one hour peak period between 6am–9am on a weekday.
construction footprint	The total extent of land required for the construction of the project, including ancillary facilities and services and land temporarily required for construction (incorporating construction elements such as compounds, access tracks and worksites).
cut-and-cover	A method of tunnel construction whereby the structure is built in an open excavation and subsequently covered.
drawdown	Reduction in the level of the water table caused by changes in the local environment.
drained structure	Drained structures are those in which groundwater can enter the structure to lower the groundwater levels adjacent to the structure.
earthworks	Operations involved in loosening, excavating, placing, shaping and compacting soil or rock.
East West Rail Link	A potential future mass transit rail line connecting Greater Parramatta and the Western Sydney Aerotropolis.
embankment	An earthen structure where the road (or other infrastructure) subgrade level is above the natural surface.
erosion	A natural process where wind or water detaches a soil particle and provides energy to move the particle.
floodplain	Area of land which is inundated by floods up to and including the probable maximum flood event (i.e. flood prone land).
greenhouse gas	Greenhouse gases are those gaseous constituents of the atmosphere that absorb and emit infra-red radiation at specific wavelengths within the spectrum of terrestrial radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. This radiation generates heat which warms the atmosphere, and therefore greenhouse gases are a key contributor to the changing climate.
groundwater dependent ecosystem	Refers to communities of plants, animals and other organisms whose extent and life process are dependent on groundwater, such as wetlands and vegetation on coastal sand dunes.
in-cutting	Section of the proposed alignment below the existing ground level.
North South Rail Line	A corridor recommended by Transport for NSW for future passenger rail line connecting Tallawong in Rouse Hill with Macarthur via St Marys and Western Sydney International.
operational footprint	The land permanently required for operation of the project.
peak flood level	The maximum water level occurring during a flood event.
Potential permanent spoil placement areas	Refers to the potential permanent spoil placement areas proposed within Western Sydney International.
placemaking	Describes an approach to the planning, design and management of public spaces.

Term	Definition
PM peak hour	Unless otherwise stated, this refers to trips travelling on the network during the average one hour peak period between 3pm–6pm on a weekday.
the project	Sydney Metro – Western Sydney Airport
Proponent	For the purpose of the project, the proponent is Sydney Metro.
runoff	The amount of rainfall that ends up as streamflow, also known as rainfall excess.
sensitive receiver	Includes residences, educational institutions (including preschools, schools, universities, TAFE colleges), health care facilities (including nursing homes, hospitals), religious facilities (including churches), child care centres, passive recreation areas (including outdoor grounds used for teaching), active recreation areas (including parks and sports grounds), commercial premises (including film and television studios, research facilities, entertainment spaces, temporary accommodation such as caravan parks and camping grounds, restaurants, office premises, retail spaces and industrial premises).
settlement or ground movement	Refers to how ground can move due to the construction of new infrastructure.
services facility	Typically includes tunnel ventilation plant rooms and associated air-distribution equipment.
St Marys to Orchard Hills tunnel	Consisting of around 4.3 kilometres of twin rail tunnels (generally located side by side) between St Marys (the northern extent of the project) and Orchard Hills.
South West Rail Link Extension	Future extension of the South West Rail Link extending the existing passenger rail line from Leppington Station to the Aerotropolis.
stabling and maintenance facility	Consists of the structures used for the stabling and maintenance of rolling stock and the operational control centre located to the south of Blaxland Creek and east of the proposed metro track.
stockpile	Temporary stored materials such as soil, sand, gravel, spoil/waste.
study area	Based on the project design to be assessed in the EIS, each technical discipline will define a study area based on the project footprint and a suitable buffer area.
surface alignment	Refers to alignment that is in cutting or at grade, or a combination of both. (i.e. not underground or in tunnel).
undrained structure	A structure in which groundwater is stopped from entering either by cut-off or waterproofing thereby limiting groundwater drawdown in the aquifer surrounding the structure.
waste hierarchy	Approach of prioritising waste avoidance and resource recovery (including reuse, reprocessing, recycling and energy recover) before consideration of waste disposal.
Western Parkland City	Part of Greater Sydney Commission's vision for a metropolis of three cities (the other two cities being the Eastern Harbour City and the Central River City). The city will be established on the strength of the new international Western Sydney International and Western Sydney Aerotropolis. It will be a polycentric city capitalising on the established centres of Liverpool, Greater Penrith and Campbelltown-Macarthur.
Western Sydney Aerotropolis	It includes the land surrounding Western Sydney International (including Bringelly, Luddenham, Kemps Creek, Badgerys Creek and Rossmore) where there will be opportunities to deliver new jobs and homes supported by key infrastructure. This will include commercial and industrial precincts, and agricultural land, as well as proposed transport corridors.

Term	Definition
Western Sydney Airport	The Australian government-owned organisation responsible for delivering and operating Western Sydney International (Nancy-Bird Walton) Airport.
Western Sydney International	Western Sydney International (Nancy-Bird Walton) Airport.
Western Sydney International Stage 1 Construction Impact Zone	Part of the on-airport environment referred to in the Airport Plan as the Construction Impact Zone.
Western Sydney International to Bringelly tunnel	Consisting of: <ul style="list-style-type: none"> around 3.3 kilometres of twin rail tunnels (including tunnel portal) within Western Sydney International from around 400 metres southwest of the Airport Business Park Station to the southern boundary of Western Sydney International (Badgerys Creek) around three kilometres of twin rail tunnels between the southern boundary of Western Sydney International (Badgerys Creek) and the Aerotropolis Core Station.
Western Sydney International tunnel portal	Refers to the tunnel portal at the northern end of the Western Sydney International to Bringelly tunnel.

Abbreviations

Abbreviation	Meaning
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHMP	Aboriginal Cultural Heritage Management Plan
AEC	areas of environmental concern
AEP	annual exceedance probability
AHIMS	Aboriginal Heritage Information Management System
Airports Act	Airports Act 1996 (Cth)
ANZECC	Australian and New Zealand Environment Conservation Council
ARMCANZ	Agriculture and Resources Management Council of Australia and New Zealand
AS	Australian Standard
BAM	Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act 2016 (NSW)
BSA	biodiversity stewardship site
CBD	central business district
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CNVS	Construction Noise and Vibration Strategy
CNVIS	Construction Noise and Vibration Impact Statement
Corridors SEPP	State Environmental Planning Policy (Major Infrastructure Corridors) 2020
CPCP	Cumberland Plain Conservation Plan
CTMF	Construction Traffic Management Framework
CTMP	Construction Traffic Management Plan

Abbreviation	Meaning
DAWE	Department of Agriculture, Water and Environment (Australian Government) (formerly DoEE)
DAP	Design Advisory Panel
DRP	Design Review Panel
dB	Decibel
DECC	(former) NSW Department of Environment and Climate Change (now Environment, Energy and Science (EES))
DECCW	(former) NSW Department of Environment, Climate Change and Water (now Environment, Energy and Science (EES))
DEOH	Defence Establishment Orchard Hills
DIRD	(former) Department of Infrastructure and Regional Development (Australian Government) now Department of Infrastructure, Transport, Regional Development and Cities (DITRDC).
DITRDC	Department of Infrastructure, Transport, Regional Development and Cities (Australian Government)
DIN 4150	German Standard DIN 4150-3: Structural vibration – Effects of vibration on structures
DPI	NSW Department of Primary Industries
ECZ	Environmental Conservation Zone
EEC	Endangered ecological community
EES	Environment, Energy and Science, a group within the NSW Department of Planning, Industry and Environment.
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPA	NSW Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
GDE	groundwater dependent ecosystem
ICNG	Interim Construction Noise Guideline
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
ISCA	Infrastructure Sustainability Council of Australia
km	kilometres
kV	kilovolt
L_{eq}	Equivalent noise level: equivalent energy averaged noise level which over a defined time period would contain the same energy as the time varying signal over the same time period.
L_{Aeq} (period)	The 'energy average noise level' evaluated over a defined measurement period (typically 15 minutes for construction noise or the relevant daytime, evening or night-time period for ambient noise monitoring).
LEP	Local Environmental Plan
LGA	local government area
LoS	level of service
m^2	square metres
m^3	cubic metres
MNES	matters of national environmental significance

Abbreviation	Meaning
NASF	National Airport Safeguarding Framework
NCA	noise catchment area
NML	noise management level
NSW	New South Wales
OCCS	Overarching Community Communications Strategy
OEH	(former) Office of Environment and Heritage (NSW Government) (now Environment, Energy and Science (EES))
ONVMP	Operational Noise and Vibration Management Plan
ONVR	Operational Noise and Vibration Review
PCT	Plant Community Types
PPV	peak particle velocity
RNP	Road Noise Policy
SEARs	Planning Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSI	State significant infrastructure
TAGG	Transport Authorities Greenhouse Gas Group
TBM	tunnel boring machine
TCP	Traffic Control Plan
TEC	Threatened Ecological Communities
UDIA	Urban Development Institute of Australia NSW
WPCA	Western Parkland City Authority
WRM	WestConnex Road Toll Model
WSAP	Western Sydney Aerotropolis Plan
WSA SEPP	State Environmental Planning Policy (Western Sydney Aerotropolis) 2020

