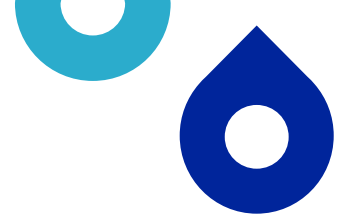




# Review of Environmental Factors

SWGA, Drinking Water Infrastructure Augmentation,  
Austral-Liverpool (April, 2026)



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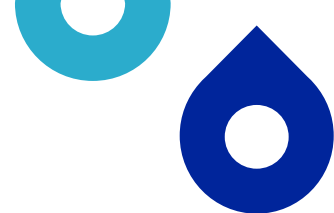
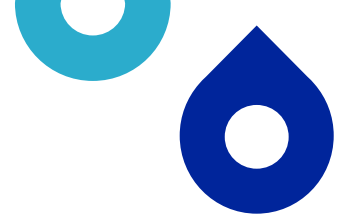


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**Sydney Water respectfully acknowledges the Traditional Custodians of the land and waters on which we work, live and learn. We pay respect to Elders past and present.**

**Sydney Water recognises the physical and cultural connection of local Aboriginal communities to waters and the land.**



# Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of the South West Growth Area (SWGA), Drinking Water Infrastructure Augmentation in Austral, Liverpool. The REF was prepared under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Sydney Water both the proponent and determining authority.

The Sydney Water Project Manager is accountable for ensuring the proposal is carried out as described in this REF. Additional environmental impact assessment may be required if the scope of work or work methods described in this REF change significantly following determination.

# Certification


I certify that I have reviewed and endorsed this REF and, to the best of my knowledge, it is in accordance with the EP&A Act and the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation). The proposal has been considered against matters listed in section 171 and section 171A (Appendix A) and the guidelines approved under section 170 of the EP&A Regulation. The information it contains is neither false nor misleading.

Prepared by:	Reviewed and endorsed by:	Endorsed by:
 Aaron Panozzo REF Author Sydney Water Date: 03/03/2026	 Stuart Dawson Senior Environmental Scientist Sydney Water Date: 03/03/2026	 Graham Knox Senior Project Manager Sydney Water Date: 10/03/2026

# Decision Statement

The main potential construction environmental impacts of the proposal include impacts to biodiversity, noise, traffic and heritage. The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and/or Biodiversity Development Assessment Report (BDAR) is not required.

Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF, the proposal is unlikely to have a significant impact on the environment. Therefore, we do not require an Environmental Impact Statement (EIS) and the proposal may proceed.

<b>Determined by:</b> Elissa Howie, A/Senior Manager Environment and Heritage Services, Sydney Water	 <b>Date:</b> 2 April 2026
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# 1. Introduction

## 1.1 Proposal background and need

Table 1-1 summarises the proposal need, objectives and consideration of alternatives.

**Table 1-1 Proposal need, objectives and consideration of alternatives**

Aspect	Relevance to proposal
Proposal need	The proposal is part of the South West Growth Area (SWGA) Drinking Water Augmentation program. The primary need of the program is to service proposed urban growth forecast in the Austral and Leppington North growth precinct. The proposal is limited to Austral in the Liverpool local government area (LGA). Delivery of the proposal is critical for Sydney Water to meet short-term local development requirements in the SWGA.
Proposal objectives	<p>The objectives of the proposal are to:</p> <ul style="list-style-type: none"><li>• maintain level of service by providing robust drinking water infrastructure for these new precincts</li><li>• improve reliability and resilience of the system by augmenting existing infrastructure to cater for the increased demands</li><li>• ensure that the assets comply with the Sydney Water and agreed stakeholder requirements</li><li>• optimise design to minimise the capital cost</li><li>• ensure safe and efficient integration of the new assets into the existing network whilst minimising supply disruption to customers.</li></ul>

## 1.2 Consideration of Ecologically Sustainable Development

Table 1-2 considers how the proposal aligns with the principles of ecologically sustainable development (ESD).

**Table 1-2 Consideration of principles of ecologically sustainable development (ESD)**

Principle	Proposal alignment
<b>Precautionary principle</b> – <i>if there are threats of serious or irreversible environmental damage, lack of scientific uncertainty should not be a reason for postponing measures to prevent environmental degradation. Public and private decisions should be guided by careful evaluation to avoid serious or irreversible damage to the environment where practicable, and an assessment of the risk-weighted consequences of various options.</i>	The proposal will not result in serious or irreversible environmental damage and mitigation measures have been designed to reduce scientific uncertainty relating to the proposal. The design has been developed to include a trenchless section beneath the unnamed tributary of Kemps Creek to reduce any potential impacts to biodiversity and water in that area. The biodiversity and Aboriginal heritage assessments have been completed to determine the level of impact and



Principle	Proposal alignment
<p><b>Inter-generational equity</b> – <i>the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.</i></p>	<p>recommend specific measures to reduce potential impacts from the proposal, which have been adopted.</p> <p>The proposal will help to meet the needs of future generations by providing a reliable water service.</p>
<p><b>Conservation of biological diversity and ecological integrity</b> – <i>conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.</i></p>	<p>The proposal will not significantly impact on biological diversity or impact ecological integrity, as concluded in the biodiversity assessment. Direct impacts to biodiversity will be limited to certified land under the South West Growth Area. No direct impacts to biodiversity in non-certified areas are anticipated as a result of the proposal and any indirect impacts would be managed with the implementation of mitigation measures.</p>
<p><b>Improved valuation, pricing and incentive mechanisms</b>— <i>environmental factors should be included in the valuation of assets and services, such as ‘polluter pays’, the users of goods and services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals</i></p>	<p>The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment.</p>

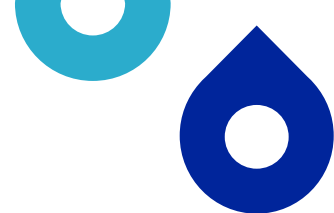
## 2. Proposal description

### 2.1 Proposal details

Table 2-1 describes the proposal and Figure 2-1 shows the location. Figure 2-2 to 2-4 show key environmental constraints.

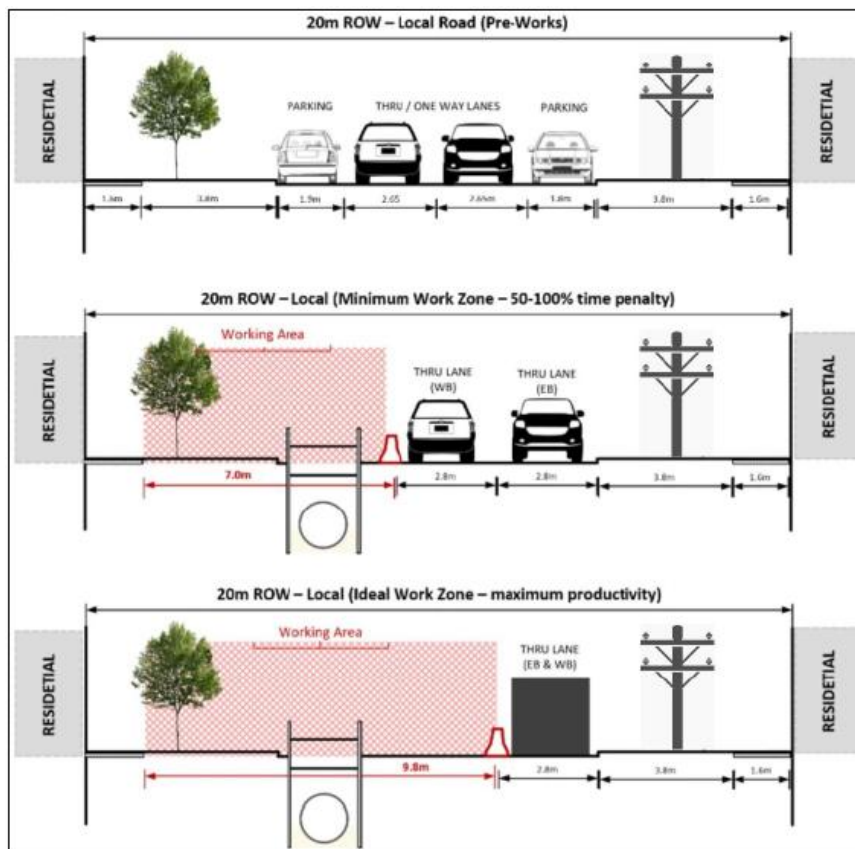
**Table 2-1 Description of proposal**

Aspect	Detailed description
Proposal description	<p>The proposal involves constructing about 2.3 kilometres of DN500 drinking water pipeline in Austral, in the Liverpool LGA. It will run along Edmondson Avenue from Ninth Avenue to Fifteenth Avenue, then continue east towards Craik Avenue, terminating near 5 Craik Avenue.</p> <p>The proposal involves cross connections to the existing water network in six locations along the alignment as well as tie ins at both ends (refer to Figure 2-1).</p> <p>The alignment will be predominantly open trenched with some areas set for trenchless installation (refer to 'Methodology' below).</p>
Location and land ownership	<p>The entire alignment will be contained within the road corridors of Edmondson Avenue, Fifteenth Avenue and Craik Avenue which includes the traffic lanes, road shoulders, verges and footpaths. These roads are owned and managed by Liverpool City Council.</p> <p>Areas identified for potential site compounds are all privately owned residential lots. Consultation with landowners is ongoing (refer to Section 3.2).</p>
Ancillary facilities (compounds)	<p>Construction compound(s) will likely be required to house site sheds, construction amenities and materials laydown. Indicative compound locations are shown on Figure 2-1 to 2-4, and are listed below:</p> <ul style="list-style-type: none"><li>• Lot 1 DP1146302 on the west side of Edmondson Avenue</li><li>• Lot 761 DP2475 on the west side of Edmondson Avenue</li><li>• Lot 419 DP2475 on the southeast corner of Fifteenth Avenue and Edmondson Avenue</li><li>• Lot 23 DP1264548 on the northeast corner of Fifteenth Avenue and Craik Avenue.</li></ul>
Methodology	<p>The alignment will be predominantly open trenched along Edmondson Avenue, Fifteenth Avenue and Craik Avenue with sections of trenchless installation in areas where constraints are present, such as utilities or environmental sensitivities.</p> <p><i>Open cut trenching</i></p> <p>Trenching will be undertaken along the northbound lane of Edmondson Avenue between Ninth Avenue and Fourteenth Avenue before crossing over to the southbound lane halfway between Fourteenth and Fifteenth Avenues. Trenching will be to depths between 2-3 metres with a width of about 1 metre.</p>



Aspect	Detailed description
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The construction footprint for trenched sections would remain within the road corridor using one lane of traffic, the road shoulder and the road verge. Minimum and ideal working zones are shown below.



### Trenchless

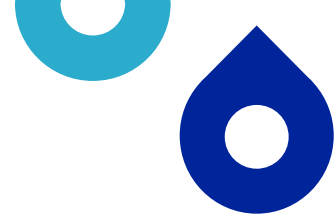
Trenchless installation will be carried out using guided auger boring at a depth of about 6 metres. Bore shafts will measure about 3 metres by 6 metres, with a construction footprint of about 7 metres by 20 metres.

Guided auger boring is proposed in the following areas:

- about 65 metres between Eleventh Avenue and Twelfth Avenue beneath the unnamed tributary of Kemps Creek
- about 40 metres beneath the Twelfth Avenue intersection to avoid underground utilities
- about 100 metres in two reaches on Fifteenth Avenue and Craik Avenue before connecting back into the existing network.

The proposal will tie into the existing network at either end of the alignment. Cross connections will occur in six locations along the alignment (refer to Figure 2-1).

Construction equipment	The following plant/equipment are required: <ul style="list-style-type: none"> <li>• ancillary equipment</li> <li>• grader</li> </ul>
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Aspect	Detailed description
	<ul style="list-style-type: none"> <li>• backhoe loaders</li> <li>• compaction equipment</li> <li>• compactors</li> <li>• concrete and shotcrete pump</li> <li>• concrete saws</li> <li>• concrete trucks</li> <li>• cranes</li> <li>• delivery vehicles</li> <li>• excavators (up to 13.5 ton)</li> <li>• front end loaders</li> <li>• generators</li> <li>• hand tools</li> <li>• light vehicles</li> <li>• paver</li> <li>• pressure testing plugs and gauges</li> <li>• pumping equipment</li> <li>• pumps and other dewatering equipment</li> <li>• semi-trailers</li> <li>• trenching machines</li> <li>• vacuum trucks</li> <li>• water trucks</li> <li>• welding equipment.</li> </ul>
Restoration	<p>The work site will be restored to the pre-existing condition following construction, in consultation with landowners.</p>
Work hours	<p>Work and deliveries will be scheduled to occur during standard daytime hours of:</p> <ul style="list-style-type: none"> <li>• 7am to 6pm, Monday to Friday</li> <li>• 8am to 1pm, Saturdays.</li> </ul> <p>The proposal is not expected to require work outside these hours. However, Sydney Water’s Project Manager can approve work outside of standard daytime hours to minimise impact to nearby sensitive receivers or if otherwise justified. The approval process is described in the mitigation measures in Section 5.1.5.</p>
Proposal timing	<p>Construction is expected to start late 2026 and take about 14-16 months.</p>
Operation	<p>The proposal will be buried after completion with the surface sealed and restored to its original condition.</p>
Commissioning	<p>Commissioning involves testing and running the new assets to ensure that they are working correctly and integrated with existing operations. Commissioning typically includes:</p> <ul style="list-style-type: none"> <li>• cleaning and disinfection of the pipes</li> <li>• pressure testing</li> <li>• inspecting and testing joints and fittings and any other operating component.</li> <li>• performance testing.</li> </ul>



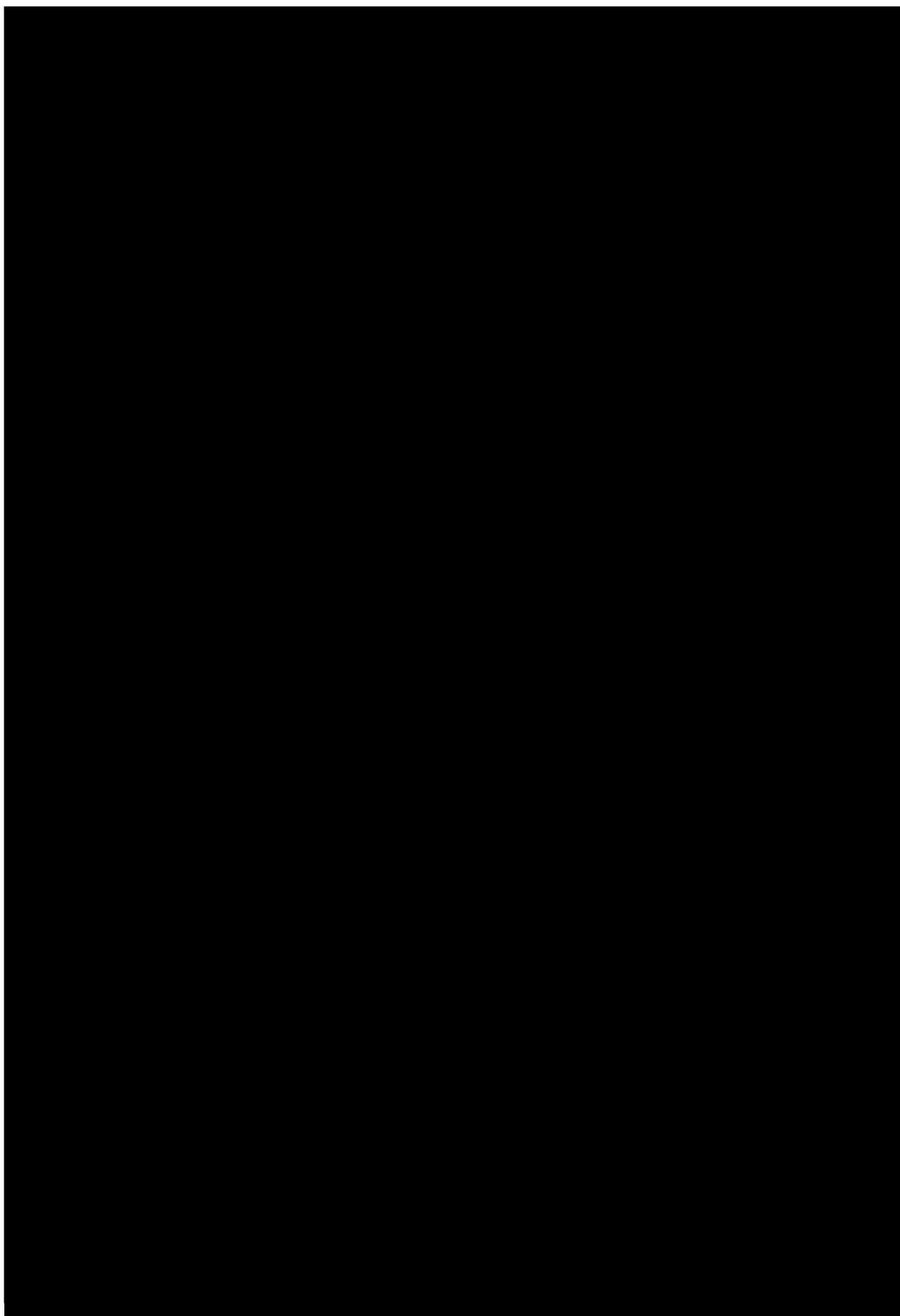
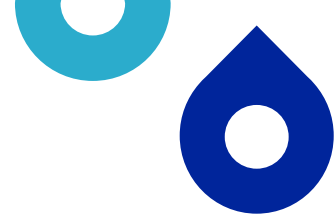
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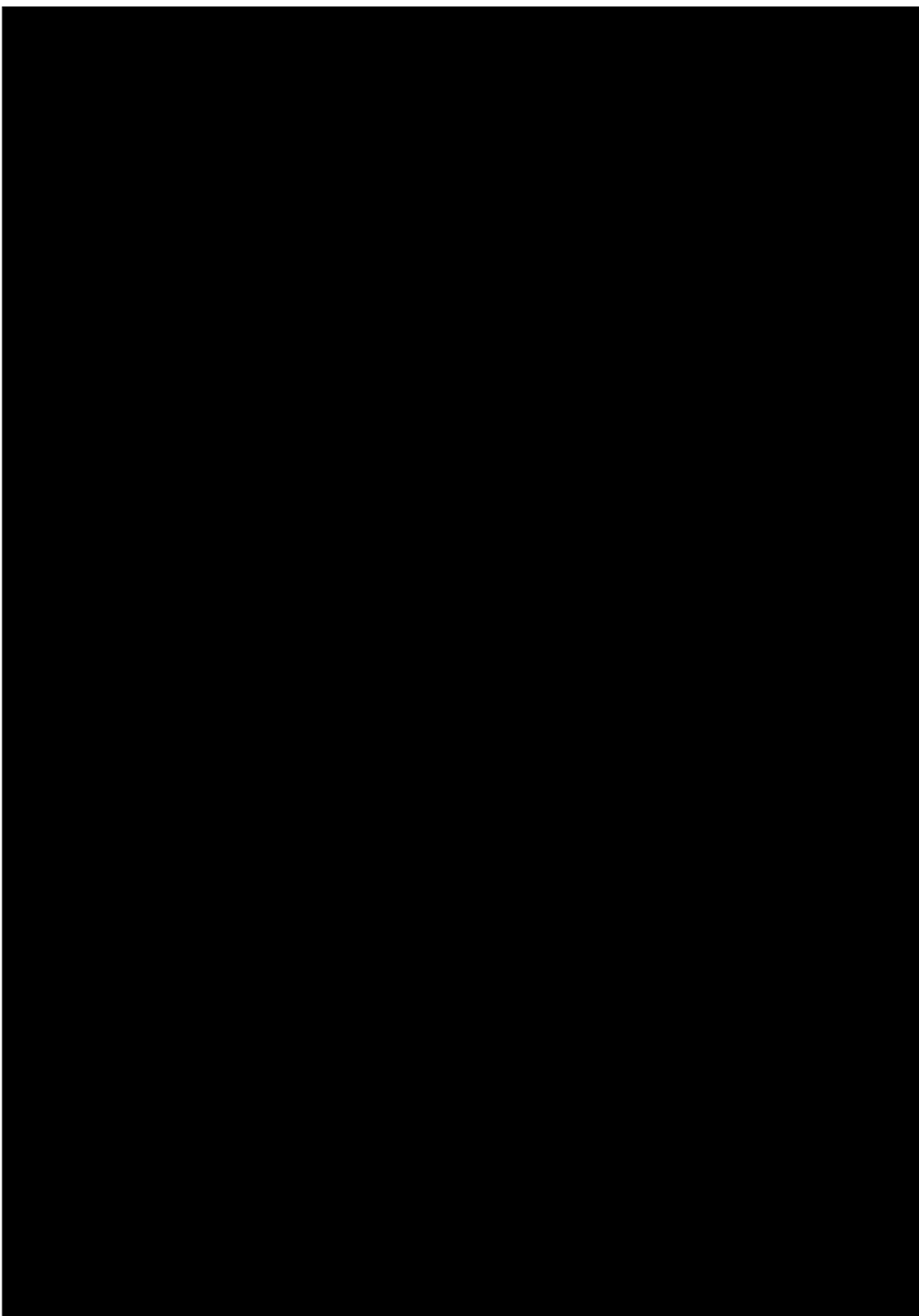
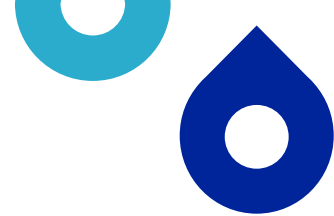


- Proposed alignment
- Proposed shaft footprint
- Proposed laydown and compounds
- Cross connections to existing network
- Tie ins to existing network
- Hydroline
- 200m buffer

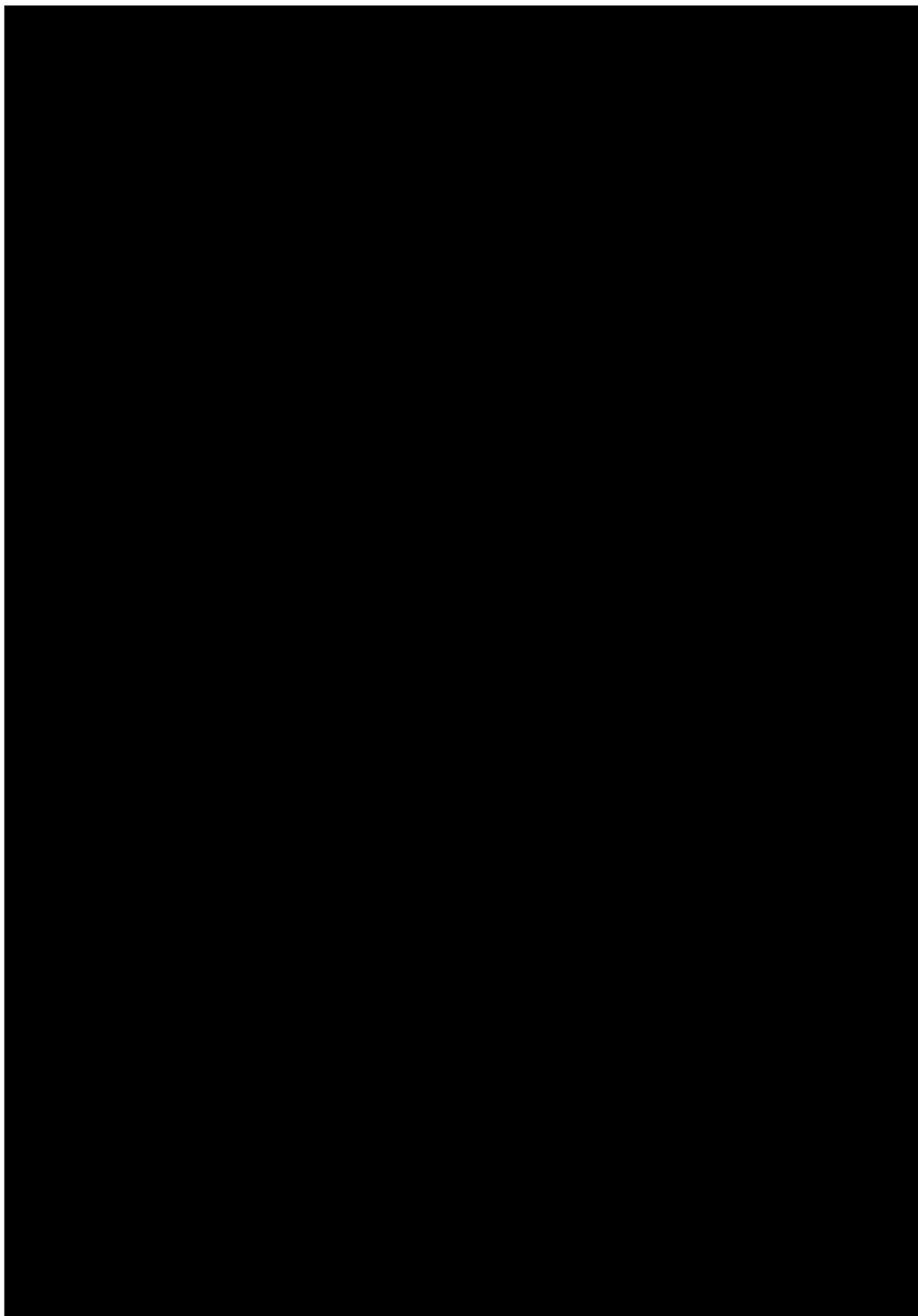
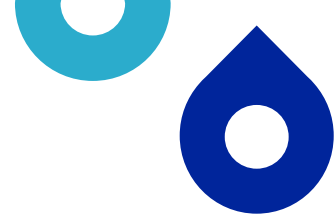
Figure 2-1 Location of proposal



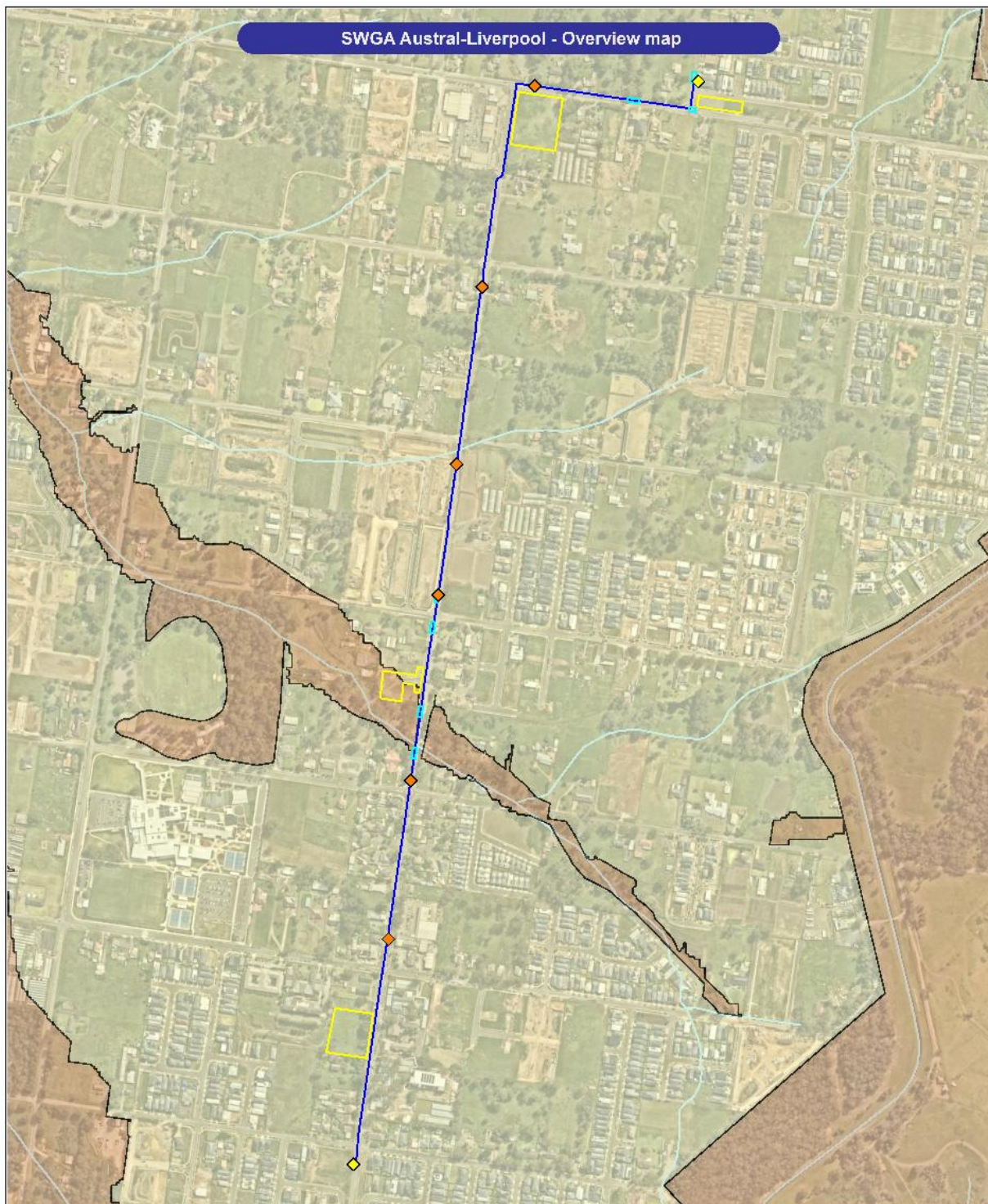
**Figure 2-2 Location of proposal and key environmental constraints (1 of 3)**



**Figure 2-3 Location of proposal and key environmental constraints (2 of 3)**

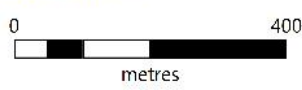


**Figure 2-4 Location of proposal and key environmental constraints (3 of 3)**



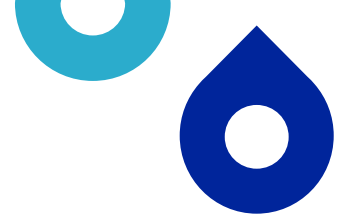
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 NSW Department of Planning, Industry & Environment  
 NSW Spatial Services  
 Australian Government, Department of Environment

Date Created: 31/03/2026



- Proposed alignment
- Proposed shaft footprint
- Proposed laydown and compounds
- ◆ Cross connections to existing network
- ◆ Tie ins to existing network
- Hydroline
- Certified land
- Non-certified land

**Figure 2-5 Location of the proposal within certified land**



## 2.2 Construction footprint and changes to the scope of work

The proposal shown in this REF is indicative and based on the latest concept design at the time of REF preparation. The final proposal may change based on detailed design and construction planning. The general mitigation measures outline when changes to the proposal trigger supplementary environmental impact assessment. If required, further assessment must be prepared in accordance with SWEMS0019.

The proposal encompasses the current scope of works including the DN500 pipeline, cross connections and tie-ins, as well as the construction footprint for trenching and auger bore shafts, site compounds and laydown areas.

The construction footprint encompasses all areas required for construction activities including the construction corridor during trenching and areas closed off for the auger bore launch and receival shafts (refer to Table 2-1).

Site compounds and laydown areas include the locations set aside for vehicle parking, material stockpiles, equipment storage and staff amenities (refer to Figure 2-1).

A field assessment was undertaken on 27 October 2025. This field assessment included site walkovers for both the Aboriginal Heritage Due Diligence and the Flora and Fauna Assessment. Information from the field assessments informed the relevant specialist studies that have been incorporated into the REF.



## 3. Consultation

### 3.1 Community and stakeholder consultation – general

Our approach to community and stakeholder consultation is guided by Sydney Water’s community and stakeholder engagement guidelines.

Stakeholder and community engagement is a planned process of initiating and maintaining relationships with external parties who have an interest in our activities. Community and stakeholder engagement:

- enables us to explain strategy, policy, proposals, proposal or programs
- gives the community and stakeholders the opportunity to share their knowledge, issues and concerns
- enables us to understand community and stakeholder views in our decision-making processes alongside safety, environment, economic, technical and operational factors.

The nature, scale and extent of the proposal’s potential impact has been evaluated in this REF. If our work impacts the community in some way, we will consult with affected groups throughout the proposal. This includes engaging the broader community and stakeholders during plan or strategy development or before making key decisions.

We will also provide local councils with reasonable notice when we would like to commence works. Local council(s) will be consulted about matters identified in environmental planning instruments such as public safety issues, temporary works on council land, and full or partial road closures of council managed roads (refer below).

### 3.2 Community and stakeholder consultation – proposal

Sydney Water prepared a Community and Stakeholder Engagement Plan (CSEP) during concept design of the proposal. The identification of community impacts and risks in the CSEP led to development of a detailed action plan for how Sydney Water and its contractors would engage with project stakeholders and the affected community as the proposal moved from planning and into design.

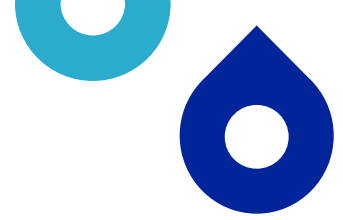
Some of the key impacts and risks identified in the CSEP related to:

- investigation and construction work having the potential to affect private property
- government agencies, local government and multiple project teams working in the same area
- ongoing property development occurring in Austral and nearby Leppington
- the potential for impacts to people and nearby properties from construction noise, dust and traffic.

The CSEP and related action plan identified key project stakeholders for ongoing consultation into the construction phase, including information about the main non-English languages spoken at home.

The plan also identifies the study area includes residential properties, commercial and retail businesses, restaurants and cafes, market gardens, properties under development, schools, three places of worship, a playgroup and community centre, a spiritual healing business and medical services.

This information helped tailor the consultation program and will help guide activities during the construction planning and delivery phases.



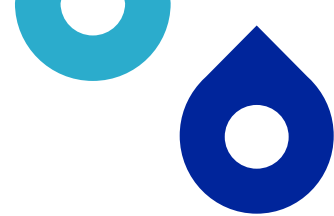
## Community consultation – homes and businesses

Community consultation with nearby properties has been ongoing throughout the proposal's planning and design. Residents and businesses within at least 100 metres of the proposal were notified in August 2025 about upcoming field investigations and the expected project benefits. They have continued to be updated about ongoing investigations work and affected landowners have been informed about potential site compound locations.

A project web page has been advertised in communication material along with a community information line (1800 000 229) and email ([SWGADrinkingwater@sydneywater.com.au](mailto:SWGADrinkingwater@sydneywater.com.au)) where people could ask questions or register to receive future updates.

Consultation and communication with impacted homes and businesses is outlined in the table below.

Date	Activity	Outcome
10 August 2025	Project introduction notification distributed to 217 properties that were within 100 metres of the proposal	<ul style="list-style-type: none"><li>• Introduced the proposal, need and benefits</li><li>• Explained upcoming site investigations and likely pipeline corridor</li><li>• Promoted project email and phone number for enquiries and feedback</li></ul>
26 August 2025	Notification to 27 adjacent properties about geotechnical investigations	<ul style="list-style-type: none"><li>• Informed adjacent properties of upcoming geotechnical investigations</li><li>• Promoted project email and phone number for enquiries and feedback</li></ul>
27 August 2025	Phone call	<ul style="list-style-type: none"><li>• Received permission to enter private property to investigate potential use of land as a future site compound or materials storage area</li><li>• Agreed process for future discussions</li></ul>
19 October 2025	Project update notification distributed to 217 properties that were within 100 metres of the proposal	<ul style="list-style-type: none"><li>• Explained the ongoing site investigations and design work</li><li>• Promoted project email and phone number for enquiries and feedback</li></ul>
20 October 2025	Phone calls and emails	<ul style="list-style-type: none"><li>• Received permission to enter private property from several landowners so that initial environmental investigations could occur</li></ul>



Date	Activity	Outcome
		<ul style="list-style-type: none"><li>Informed landowners of pipeline proposal and potential use of land as a future site compound or materials storage area</li></ul>
Late 2025	Phone calls and emails	<ul style="list-style-type: none"><li>Update provided to several developers and property owners who were interested in when new water infrastructure would be delivered (to enable further development to occur)</li></ul>
3 February 2026	Project update notification distributed to 4,712 properties that may be affected by night work	<ul style="list-style-type: none"><li>Informed more properties about the proposal including the need for day and night-time investigations work in the area</li><li>Provided website details for the latest project information</li><li>Explained the expected timing for project delivery, subject to approvals</li></ul>

Community feedback to date has been limited. Affected landowners have given permission for site investigations to occur on their properties and enquiries have been received and responded to about the timing for project delivery.

## Consultation with local government and government agencies

The proposal is located within the Liverpool Local Government Area under the jurisdiction of Liverpool City Council (Council). Consultation with Council was initiated at the start of the project and will continue throughout the duration of the project. Council has been involved in reviewing the concept design and will continue to be involved during detailed design.

Transport for NSW (TfNSW) were also consulted at the start of the project as they are managing the planning and design of a major road upgrade along Fifteenth Avenue. The key outcome of the consultation was that the proposal is constructed at a depth that will not interfere with or require future relocation during their road upgrades.

## Consultation with First Nations stakeholders

Sydney Water will share information and consider feedback from First Nations stakeholders about this and other planned water and wastewater projects in the Aerotropolis and South West Growth Area. This consultation is non-statutory engagement with traditional custodians that is guided by Sydney Water's senior advisor for First Nations engagement.



### **3.3 Consultation required under State Environmental Planning Policies and other legislation**

Sydney Water must consult with councils and other authorities for work in sensitive locations or where the work may impact other agencies' infrastructure or land. This is specified in the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP).

Consultation was required under section 2.10 (e) and (f) as the proposal involves enclosing a section of a council owned road as well as excavation in a council owned road that is not minor or inconsequential respectively. Liverpool City Council was consulted on 22 January 2026 and a response was not received. Sydney Water will consider any matters raised by Council.

Consultation was required under section 2.15 (2)(h) as the proposal involves development within the Western City operational area with a capital investment of \$30 million or more. Western Parkland City Authority (WPCA) was consulted on 25 March 2026, and a response was received the same day. WPCA had no comments on the proposal.

Further detail is provided in Appendix B.

### **3.4 Consultation during construction planning and delivery**

No significant issues have been raised by the community so far. Future community consultation will include project newsletters and meetings with directly affected landowners to inform them about how and when construction will occur and what Sydney Water's Delivery Contractor will do to manage potential impacts.

Sydney Water and its contractors will continue to provide ways for people who speak a language other than English to engage with the project team.

Liaison with TfNSW and Liverpool City Council will continue throughout the proposal.

# 4. Legislative requirements

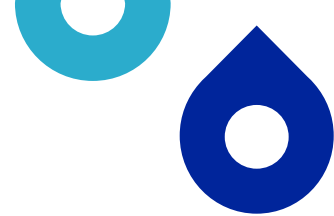
## 4.1 Environmental legislation

Sydney Water is the proponent and determining authority under the EP&A Act. The proposal does not require development consent and is not classified as State significant infrastructure. We have assessed this proposal under Division 5.1 of the EP&A Act. This REF has concluded that the proposal is unlikely to have a significant impact on the environment.

The following environmental planning instruments (Table 4-1) and legislation (Table 4-2) are relevant to the proposal. Table 4-2 also documents any licences and permits required, and timing and responsibility for obtaining them.

**Table 4-1 Environmental planning instruments relevant to the proposal**

Environmental Planning Instrument	Relevance to proposal
Liverpool Local Environmental Plan 2008 (Liverpool LEP)	<p>The proposed alignment is within the Liverpool LGA on land zoned SP2 (infrastructure).</p> <p>Compounds are proposed on land zoned:</p> <ul style="list-style-type: none"><li>• R2 - Low density residential</li><li>• R3 - Medium density residential</li><li>• C4 - Environmental living</li><li>• B2 - Local centre.</li></ul>
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	<p>Section 2.159 of the TISEPP permits development for the purpose of water reticulation systems without consent on any land when carried out by or on behalf of a public authority.</p> <p>The proposal involves development of a water reticulation system and as Sydney Water is a public authority, the proposal is permissible without consent.</p>
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BCSEPP)	<p><b>Vegetation in non-rural areas (Chapter 2)</b></p> <p>The proposal is in an area or zone listed in subsection 2.3(1). However, subsection 2.4(1) states: '<i>This Policy does not affect the provisions of any other SEPP....</i>', and as the works are permissible under the TISEPP, a council permit to clear vegetation under this SEPP is not required.</p> <p><b>Koala habitat protection (2020 and 2021) (Chapter 3 and 4)</b></p> <p>These chapters aim to encourage the proper conservation and management of areas of natural vegetation that provide koala habitat. This is to ensure that permanent free-living populations are protected in their present</p>



Environmental Planning Instrument	Relevance to proposal
<p>State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (Precincts SEPP)</p>	<p>range, and to reverse the current trend of population decline.</p> <p>The SEPP contains prescriptions for the consideration of ‘potential koala habitat’ and ‘core koala habitat’ for developments within local government areas listed in schedule 2 of the SEPP.</p> <p>The proposal lies within the Liverpool LGA, which is in the Central Coast Koala management area. Chapter 3 and 4 of the BCSEPP apply to development that requires consent. As Sydney Water is the determining authority for the proposal and does not require development consent these chapters do not apply.</p> <p>Impacts to biodiversity are assessed in Section 5.1.3 and appropriate measures have been provided.</p>

**Sydney Region Growth Centres (Chapter 3)**

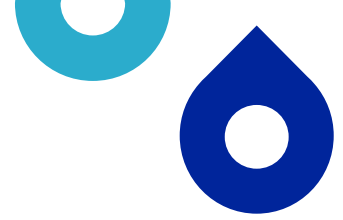
The proposal is located on land to which Chapter 3 of this SEPP applies. The proposal is located within the boundaries of the South West Growth Centre. The alignment is predominantly located within biodiversity-certified land, with a short section crossing over non-certified land around the unnamed watercourse between Eleventh and Twelfth Avenues.

Available mapping shows vegetation in this area is also classified as Existing Native Vegetation (ENV). The Flora and Fauna assessment determined that no vegetation classified as ENV is located within the construction footprint. Impacts to ground-truthed ENV nearby are not anticipated.

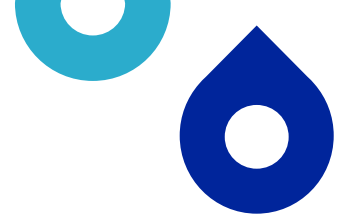
Available mapping shows several heritage items previously identified under the former Sydney Region Growth Centres SEPP 2006, with these provisions now incorporated into the relevant Precinct SEPP (refer to Section 5.1.4).

**Table 4-2 Consideration of key environmental legislation**

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<p><i>Biodiversity Conservation Act 2016 (BC Act)</i></p>	<p>Schedules 1 and 2 of the BC Act list threatened species and threatened ecological communities in NSW.</p> <p>Sydney Water is required to assess impacts to listed entities in accordance with section 7.3 of the BC act.</p>	<p>REF</p>	<p>Pre-construction, Sydney Water</p>



Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	<p>Most of the proposal is within land that is biodiversity-certified under the former Sydney Region Growth Centres SEPP, now the Precincts SEPP. This means that for works within mapped certified areas, further assessment of threatened-species or threatened ecological communities is not required.</p> <p>A flora and fauna assessment has been completed for non-certified areas (Appendix C). The assessment found that the proposal is unlikely to significantly affect any threatened species or ecological communities.</p> <p>Potential impacts to threatened species and communities have been assessed and mitigation measures provided in Section 5.1.3.</p>		
<p><i>National Parks and Wildlife Act 1974 (NPW Act)</i></p>	<p>Under section 86 of this Act, it is an offence to harm or desecrate an Aboriginal place or object unless authorised by an Aboriginal heritage impact permit (AHIP) or where it is reasonably determined that no Aboriginal object would be harmed.</p> <p>Parts of the proposal are within or nearby Aboriginal Heritage Information Management System (AHIMS) sites.</p> <p>An Aboriginal Heritage Due Diligence has been completed for the works (Appendix D). All works will be within previously disturbed areas. The proposal will not directly or indirectly impact any known Aboriginal archaeological sites, Aboriginal objects, or places.</p> <p>Potential impacts to Aboriginal Heritage have been assessed and mitigation measures provided in Section 5.1.4.</p>	<p>Approval not required</p>	<p>N/A</p>
<p><i>Water Act 1912/ Water Management Act 2000</i></p>	<p>All dewatering activities require an approval under Section 91B of the <i>Water Management Act 2000</i>.</p> <p>Excavation for the proposal may require dewatering in various locations including at the creek crossing of the unnamed stream between Eleventh Avenue and Twelfth Avenue. A Water Supply Works Approval is required for dewatering of groundwater. The groundwater assessment (Pentium, 2025) estimates that about 1.1 megalitre (ML) of groundwater will need to be removed. Therefore, a Water Supply Works Approval (WSWA) is required.</p>	<p>WSWA</p>	<p>Pre-construction, Sydney Water</p>



Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	<p>Potential impacts to water have been assessed and mitigation measures provided in Section 5.1.2.</p>		
<p><i>Roads Act 1993</i></p>	<p>This Act regulates works in, on or over a public road. Approval under Section 138(1) of this Act is required for carrying out works within, that dig up or disturb a classified road.</p> <p>Construction of the proposal will require excavation and partial road closures along Edmondson Avenue, Fifteenth Avenue, and Craik Avenue. A traffic management plan (TMP) and Road Occupancy Licence (ROL) would manage traffic control and potential impacts to traffic. As the proposal is limited to council managed roads the ROL will be acquired through Liverpool council.</p> <p>Potential impacts to traffic and access have been assessed and mitigation measures provided in Section 5.1.8.</p>	<p>Road Occupancy Licence</p>	<p>Pre-construction, contractor</p>
<p><i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i></p>	<p><i>The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i> is the principal environmental law administered by the Commonwealth. It provides for the protection of matters of national environmental significance. Under the EPBC Act, an action that is likely to have a significant impact on a matter of national environmental significance (MNES) must be referred to the Commonwealth Minister for Climate Change, Energy, the Environment and Water.</p> <p>The Sydney Growth Centres Strategic Assessment considers the impact of development on MNES under the EPBC Act and ensures eligible developments within existing certified land don't need individual approval. The assessment uses several mechanisms to protect and manage biodiversity within growth centres including:</p> <ul style="list-style-type: none"> <li>• rezoning of high value areas</li> <li>• additional planning controls and environmental management controls</li> <li>• implementation of the growth centres conservation fund and biodiversity offset program.</li> </ul> <p>One EPBC listed threatened ecological community (Cumberland Shale Plain Woodlands and Shale-Gravel Transition Forest) was</p>	<p>Referral not required</p>	<p>N/A</p>



Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	<p>recorded within the study area. This community exists entirely within existing certified land and does not require formal assessment under the EPBC Act.</p> <p>The Flora and Fauna Assessment (Appendix C) concluded that the proposal is unlikely to have a significant impact on MNES within areas of non-certified land and accordingly, referral is not required.</p> <p>Potential impacts to flora and fauna have been assessed and mitigation measures provided in Section 5.1.3.</p>		



## 5. Environmental assessment

Section 5.1 describes the existing environment and assesses direct and indirect impacts of construction and operation. It also identifies mitigation measures to minimise impacts. These will be incorporated into contract documents and a Construction Environmental Management Plan (or similar) prior to starting work.

### 5.1 Environmental aspects, impacts and mitigation measures

#### 5.1.1 Topography, geology and soils

##### Existing environment and potential impacts

###### *Existing environment*

The proposal:

- is in an area impacted by localised soil salinity hazard, with the area around the creek crossing mapped as having extensive soil salinity hazard (DLWC Salinity Hazard)
- is located on Bringelly Shale of the Wianamatta Group, comprising shale, carbonaceous claystone, laminate, and fine- to medium grained sandstone
- is in an area of gently undulating hills. The area now comprises a largely modified landscape shaped by the construction of roads and residences
- is not in an area impacted by acid sulphate soils (ASS)
- has no contaminated sites notified to the EPA within 2 kilometres.

###### *Construction impacts*

During construction, the road surface will be disturbed, and soil will be excavated and stockpiled. Spoil from excavations will be temporarily stockpiled adjacent to the work area. These activities will expose soil, which could result in potential off-site erosion and sedimentation of surrounding land and waterways.

Inappropriate management of saline soils or construction materials could also lead to off-site leaching of contaminants or saline soils, potentially impacting surrounding land and waterways.

Given the previous rural land uses of the surrounding area, there is the potential to uncover unexpected contamination. The unexpected finds protocol would manage any potential impacts.

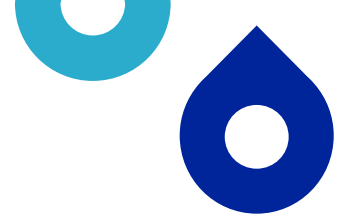
The proposal does not involve permanent changes to the existing surface topography or drainage patterns. Following construction, the area will be reinstated to its original topography and drainage configuration.

###### *Operation impacts*

Following construction, all excavations will be backfilled, the pipeline will be sealed and buried and the road surface reinstated. As such, no operational impacts to topography, geology or soils are anticipated.

##### Mitigation measures

With the implementation of the mitigation measures below, impacts to topography, geology and soils can be adequately managed, and residual impacts are expected to be minor.



**Table 5-1 Environmental mitigation measures — topography, geology and soils**

### Mitigation measures

Prevent sediment moving off-site in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including but not limited to:

- divert surface runoff away from disturbed soil and stockpiles
- install sediment and erosion controls before construction starts
- reuse topsoil where possible and stockpile separately
- inspect controls at least weekly and immediately after rainfall
- rectify damaged controls immediately
- remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines.

Minimise ground disturbance and stabilise disturbed areas progressively.

Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic material within fill, asbestos, chemical or petrol odours and leachate. Contain disturbed material on an impermeable surface and cordon areas off. Notify the Sydney Water Project Manager and the Environmental Representative (who will contact Contamination and Hazards team) to agree on proposed management approach.

Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off-site.

Sweep up any sediment/soil transferred off-site at least daily, or before rainfall.

Eliminate ponding and erosion by restoring natural landforms to the pre-works condition.

Adopt appropriate soil salinity mitigation measures in accordance with [Western Sydney Salinity Code of Practice](#) (Western Sydney Regional Organisation of Councils, 2003). This may include:

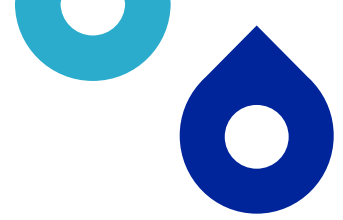
- treating existing salinity with gypsum
- stabilising existing areas of erosion
- minimising water use on site
- avoiding rotation and vertical displacement of the original soil profile
- backfilling excavations deeper than one metre in the same order or treating or using this material as fill at depths more than one metre from the finished level.

## 5.1.2 Water and drainage

### Existing environment and potential impacts

#### *Existing environment*

The proposal is about 1.7 kilometres from the nearest major waterway, Kemps Creek, which is classified as Key Fish Habitat. The alignment crosses an unnamed tributary of Kemps Creek between Eleventh Avenue and Twelfth Avenue and a drainage line to this tributary at the Thirteenth Avenue intersection. These minor watercourses form part of the local surface water drainage network and ultimately contribute flows to Kemps



Creek. At the time of the field survey, no water flow was observed and there was no evidence of recent stream flow suggesting these waterways are seasonal/ephemeral.

Flood mapping from the NSW Flood Data Portal (NSW SES, 2025) and Liverpool City Council indicate that the proposal is outside a flood prone area.

Geotechnical investigations completed by Douglas Pty Ltd Partners on 22 October 2025 indicate that groundwater levels across the alignment are high, varying between 1 and 3.6 metres below ground level. Excavation to a depth of 1.8 metres is required for the trenched sections of the alignment and up to 6 metres for the trenchless sections. Therefore, it is anticipated that groundwater will be encountered during construction and dewatering will be required. A preliminary Hydrogeological Assessment undertaken by Pentium Water Pty Ltd (2025) estimated that about 1.1 ML of groundwater would need to be removed.

### *Construction impacts*

The proposal requires:

- guided auger boring beneath a waterway on Edmondson Avenue
- excavation and stockpiling
- storage of fuels and chemicals on site
- dewatering of groundwater during construction.

Potential impacts to waterways have been reduced through the selection of guided auger boring, which allows the pipeline to be installed beneath existing watercourses without disturbing flow, the bed or banks.

Disturbance of soil and stockpiling of spoil adjacent to work areas creates the potential for sediment movement into the unnamed tributary and associated drainage lines if not appropriately managed. Although the proposal is outside mapped flood-prone land, significant rainfall events may still mobilise spoil, increase erosion risk, or cause off-site sedimentation. In addition, poor handling of fuels, chemicals or water generated during the works could result in contamination of surface water or shallow groundwater.

Dewatering has the potential to cause localised drawdown, which may temporarily affect nearby groundwater-dependent vegetation communities near the creek crossing (further consideration is given to this in the Fauna and Flora section below). Extraction of groundwater also creates a requirement for suitable treatment, reuse, or disposal to avoid adverse impacts on the receiving environment.

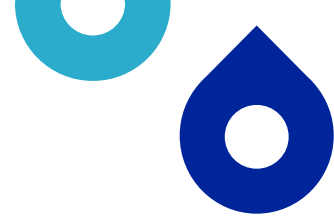
Discharge of drinking water from existing infrastructure and commissioning will be in line with Sydney Water's D0001667 Water Quality Management During Operational Activities procedure.

### *Operational impacts*

Following construction, all excavations will be backfilled, the pipeline will be sealed and buried, and the road surface reinstated. No operational discharges, alterations to surface-water drainage, or ongoing groundwater interactions are proposed. As such, no operational impacts to water quality, hydrology, or drainage are anticipated.

## **Mitigation measures**

With the implementation of the mitigation measures below, impacts to water and drainage can be adequately managed, and residual impacts are expected to be minor.



**Table 5-2 Environmental mitigation measures — water and drainage**

### Mitigation measures

Use appropriate controls to avoid potential sedimentation to waterbodies.

Creek crossings will be underbored to reduce impacts to the waterways. If detailed design determines this is not feasible, alternative design will require additional assessment.

Bund potential contaminants and store them on a robust waterproof membrane, away from drainage lines.

Locate portable site amenities away from watercourses or drainage lines.

Conduct refuelling, fuel decanting and vehicle maintenance in compounds where possible. If field refuelling is necessary, designate an area away from waterways and drainage lines with functioning spill kits close by.

Keep a functioning spill kit on site for the clean-up of accidental chemical/fuel spills. Keep the spill kits stocked and located for easy access.

Sydney Water will obtain a groundwater Water Supply Works Approval. The Delivery Contractor is responsible for:

- preparing all application material including a Dewatering Management Plan prior to construction
- complying with the conditions of the approvals (such as protecting water quality; minimising aquifer extraction volumes, monitoring extraction with flow metres and recording volumes).

Minimise groundwater ingress during detailed design. As part of the CEMP, prepare a Dewatering Management Plan for groundwater dewatering. This should include elements such as how water quality will be protected and how extraction volumes will be monitored.

Discharge all water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable / groundwater water where possible.

If discharge of water to the environment is not possible:

- Seek approval and discharge criteria from the relevant Sydney Water Network Area Manager prior to discharge of water to the wastewater system. Otherwise tanker by a licensed waste contractor and dispose off-site to an appropriately licensed facility.

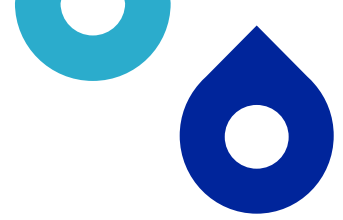
## 5.1.3 Flora and fauna

### Existing environment and potential impacts

A flora and fauna assessment was completed by Biosis Pty Ltd (Biosis) on 20 February 2026 (Appendix C). A field assessment was undertaken on 28 October 2025.

#### *Existing environment*

The study area is characterised by residential living with mixed land uses. Native vegetation in the study area is predominantly in low condition, occurring in narrow linear remnants influenced by adjacent land



uses. A 20 metre buffer was applied to the proposed alignment for the field assessment as shown in Figure 2-2 to 2-4.

The majority of the study area is located on certified land under the South West Growth Area (SWGA) (Chapter 3 of the Western City Parklands SEPP). However, about 0.29 ha of native vegetation within the riparian corridor of the unnamed tributary of Kemps Creek is mapped as non-certified land. The assessment of threatened species and their habitats only applies to areas of existing non-certified land.

The following vegetation communities were identified across the entire study area (refer Figure 2-2 to 2-4):

- PCT 3320 Cumberland Shale Plains Woodland
  - *Cumberland Plain Woodland in the Sydney Basin Bioregion* (CEEC, BC Act)
  - *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* (CEEC, EPBC Act).
- PCT 4025 Cumberland Red Gum Riverflat Forest
  - *River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (EEC, BC Act).
  - *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* (CEEC, EPBC Act).
- Urban native/exotic vegetation.

The proposal is adjacent to mapped groundwater dependant ecosystem (GDE) Cumberland Red Gum Riverflat Forest. The GDE is categorised as low value and is not high priority under the High Ecological value aquatic ecosystem (HEVAE) framework. Aquatic habitats in the study area are centred around the tributary of Kemps Creek. The riparian zone is dominated by aquatic weeds and exotic grasses.

Four priority weeds were recorded within the study area, including:

- Alligator Weed (*Alternanthera philoxeroides*)
- African Boxthorn (*Lycium ferocissimum*)
- African Olive (*Olea europaea* subsp. *cuspidate*)
- Prickly Pear (*Opuntia stricta*).

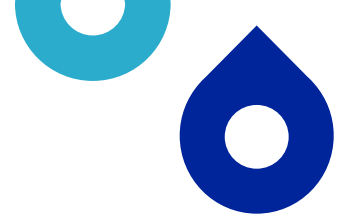
Desktop review identified 30 threatened flora species and 64 threatened fauna species recorded or predicted to occur within 5 kilometres of the study area. Species considered most likely to occur within the study area include the following:

#### Flora

- Downy Wattle *Acacia pubescens* (Vulnerable, EPBC Act and BC Act)
- *Dillwynia tenuifolia* (Vulnerable, BC Act)
- *Pultenaea parviflora* (Vulnerable, EPBC Act and Endangered BC Act).

#### Fauna

- Cumberland Plain Land Snail *Meridolum corneovirens*, (Endangered, BC Act)
- Eastern Coastal Free-tailed Bat *Mormopterus norfolkensis* (Vulnerable, BC Act)
- Southern Myotis *Myotis macropus* (Vulnerable, BC Act)
- Grey-headed Flying-fox *Pteropus poliocephalus* (Vulnerable, EPBC and BC Act).



Outcomes of the likelihood of occurrence assessments for the above threatened species are in Appendix C.

### *Construction impacts*

Two threatened entities listed under the BC Act (Cumberland Plain Land Snail and River-Flat Eucalypt Forest) were recorded or have a medium or greater likelihood of occurring within the existing non-certified sections of the study area. Indirect impacts may include:

- disturbance of nearby fauna due to noise, vibration and human presence during construction activities
- temporary disturbance of foraging, shelter or movement habitat for nearby fauna
- potential edge effect on adjacent vegetation such as accidental damage, dust deposition or weed invasion.

There is the potential to spread weeds due to the movement of personnel and equipment into, around and out of the proposal area.

Construction of the proposal will not result in any direct impacts to vegetation and threatened species within non-certified land under the SWGA. Any potential impacts will be of an indirect nature.

The proposal will be contained to the road corridor and pre-disturbed lots, and with the application of mitigation measures impacts to flora and fauna are considered unlikely.

Dewatering has the potential to cause localised drawdown, which may affect nearby groundwater-dependent vegetation communities. The estimated volume of dewatering required is about 1.1 ML and the duration of dewatering will be limited and temporary. The groundwater assessment (Pentium, 2025) states that drawdown will be very shallow and limited. As such, there is minimal risk to nearby groundwater dependent ecosystems.

### *Operational impacts*

Following construction, the pipeline will be buried, and all disturbed surfaces reinstated to their pre-existing condition. Therefore, no operational impacts to flora and fauna are expected.

## **Mitigation measures**

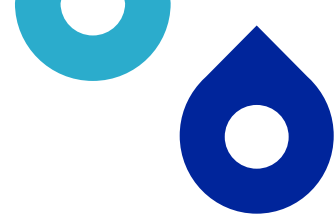
With the implementation of the mitigation measures below, potential impacts to flora and fauna can be adequately managed, and residual impacts are expected to be minor.

**Table 5-3 Environmental mitigation measures — flora and fauna**

### **Mitigation measures**

Provided it is essential for delivering the project, Sydney Water's Project Manager can approve the following vegetation removal and tree trimming, in areas of certified land, without additional environmental assessment (but only after consultation with the Environmental and Community Representatives and affected landowners). Sydney Water considers vegetation removal in these circumstances has minimal environmental impact.

- Any minor:
  - vegetation trimming or
  - removal of exotic vegetation or



## Mitigation measures

- removal of planted native vegetation.

where the vegetation is not a threatened species (including a characteristic species of a threatened community or population), heritage listed, in declared critical habitat or in a declared area of outstanding biodiversity value.

- Any removal of remnant vegetation where there is no net change to environmental impact (e.g. a different area of vegetation is removed but the total area is the same or less than assessed in the EIA).

Written explanation of the application of this clause (including justification of the need for trimming or removal and any proposed revegetation) should be provided when seeking Project Manager approval. Any impacts to native vegetation and trees must be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).

If impacts to vegetation cannot be avoided, minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Where possible, limit clearing to trimming rather than the removal of whole plants.

The removal of existing native vegetation (ENV) is not permitted under this assessment. If any future design requires it, additional assessment is required.

Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.

Adjust methodology (e.g. avoid area, hand excavate, implement exclusion fencing) to protect sensitive areas where possible (such as mature trees, known threatened species, populations or ecological communities).

An arborist assessment will be undertaken during detailed design to determine any impacts to tree root zones. Any recommendations from the report should be considered. Should tree removal be required, consult with the Project Manager and Environmental Representative.

Protect trees in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary, and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone

Retain dead tree trunks, bush rock or logs in-situ unless they are in the impact area and moving is unavoidable. Reposition material elsewhere on the site or approved adjacent sites. If native fauna is likely to be present, a licensed ecologist should inspect the removal and undertake fauna relocation.

If native fauna is encountered on site, stop work and allow the fauna to move away un-harassed. Engage a licensed ecologist if assistance is required to move fauna

Avoid impeding/blocking fish passage. Retain snags and natural obstructions in waterways where possible.

Stop work immediately and notify the Sydney Water Project Manager if any threatened species (flora or fauna) is discovered during the works. Work will only recommence once the impact on the species has been assessed and appropriate control measures provided.

## Mitigation measures

Manage biosecurity in accordance with:

- *Biosecurity Act 2015* (see NSW Weedwise), including reporting new weed infestations or invasive pests
- contemporary bush regeneration practices, including disposal of sealed bagged weeds to a licenced waste disposal facility.

To prevent spread of weeds:

- clean all equipment including PPE prior to entering or leaving the work sites
- wrap straw bales in geo-fabric to prevent seed spread.

Minimise impacts on native vegetation in non-certified areas, native vegetation retention areas and areas outside the growth centre. Options to consider where feasible include:

- alternative construction methodologies (under bore vegetation and waterways, compressed construction corridors)
- avoiding impact to hollow bearing and habitat trees.

Vegetation removal required must not occur until the following are complete:

- the area to be removed has been physically delineated
- the Contractor's Environmental Representative has confirmed consistency with approval documentation
- pre-clearing surveys, if relevant
- written authorisation to commence clearing from Sydney Water Project Manager.

All stockpile and compound areas are to be located within existing cleared areas and existing access tracks. Any impacted area will be rehabilitated at the end of construction.

All staff on site are to be educated on the ID characteristics of the threatened species identified as having a moderate likelihood of occurrence and advised to not handle fauna species under any circumstances during toolbox talks.

No-go fencing installed for retained vegetation to ensure surrounding area remains undisturbed.

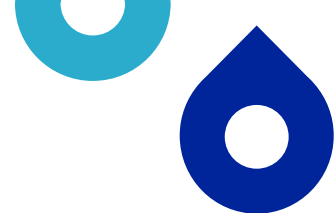
### 5.1.4 Heritage

#### Existing environment and potential impacts

##### *Aboriginal heritage*

An Aboriginal archaeological due diligence assessment was completed by AECOM (refer to Appendix D). A field inspection of the proposal was completed on 28 October 2025.

Consideration of the landscape context of the project area uses factors such as topography, geology, hydrology, and local resources as well as an understanding of historical and contemporary land use to determine archaeological potential and assess for impacts.



Existing archaeological survey data for the Cumberland Plain indicate a strong trend for the presence of open artefact sites along watercourses, specifically, on creek banks, terraces and bordering lower slopes. Artefact distributions within these areas have typically been referred to as 'background scatter'.

Extant vegetation has been cleared during the gradual development of the area and historical aerial imagery indicates the road corridor has been highly disturbed. Proposed compound and laydown areas are less disturbed but have still been cleared of vegetation and subject to localised disturbance.

A search of the Aboriginal Heritage Information Management System (AHIMS) database identified several sites in the search area, however only three sites were within or nearby the proposal:

- [Redacted]
- [Redacted]
- [Redacted]

A review of the State Heritage Inventory identified no Aboriginal sites or places within or nearby the proposal.

Key findings of the due diligence assessment included the following:

- No new Aboriginal objects/sites were identified.
- [Redacted]
- [Redacted]

### *Non-Aboriginal heritage*

A review of the State Heritage Inventory (SHI) identified no World, Commonwealth or State heritage items nearby. The proposal is adjacent to the several local heritage items that were formerly identified under the Sydney Region Growth Centres SEPP 2006. These items are now incorporated in the heritage provisions and mapped areas of the Precincts (Western City Parkland) SEPP 2021 (refer Figure 2-4):

- Austral town centre (ID: C1) – Heritage conservation area



- Ian's hardware and House, 256 Edmondson Ave (ID: 7) – General heritage item
- H.J. Starr Progress Hall, 264 Edmondson Ave (ID: 3) – General heritage item
- 275-277 Edmondson Avenue (ID: 5) – General heritage item.

*Construction impacts*

The construction footprint will occur within the road reserve and is outside the curtilage of all listed non-Aboriginal heritage items. Works are not expected to alter the significance or the physical integrity of the listed heritage items.

[Redacted text block]

[Redacted text block]

[Redacted text block]

Given the distance from the works and the nature of the construction plant to be used, vibration levels are expected to remain below thresholds associated with heritage structural sensitivity. (see Section 5.1.5). Accordingly, direct or indirect construction impacts to Aboriginal or Non-Aboriginal heritage are unlikely.

*Operational impacts*

Following construction, the pipeline will be buried, and all disturbed surfaces reinstated to their pre-existing condition. No above-ground infrastructure will be visible or alter the heritage setting. Therefore, no operational impacts to Aboriginal or Non-Aboriginal heritage are expected.



## Mitigation measures

With the implementation of the mitigation measures below, potential impacts to heritage can be adequately managed, and residual impacts are expected to be negligible.

**Table 5-4 Environmental mitigation measures — heritage**

### Mitigation measures

Use of the compound and laydown area [REDACTED] may occur subject to the following conditions:

- use is restricted to the area previously used by Sydney Water and no new previously undisturbed areas are impacted
- no additional subsurface disturbance is to occur beyond what was previously undertaken
- consideration should be given to the use of geofabric or similar material to protect underlying soils
- use of the area is generally consistent with Sydney Water’s previous use of the site.

[REDACTED]

Subject to adherence to the above measure, no further Aboriginal heritage assessment works are considered warranted for the proposed activity.

All site personnel must be inducted by a heritage specialist (or delegate) before starting work on site. The induction should include clear explanation of heritage constraints, go and no-go areas, measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.

In the event that Aboriginal objects/sites, including possible human skeletal material (remains), are identified during the proposed activity all works in the area must cease immediately and the relevant provision of Sydney Water’s Environmental Management System (SWEMS0009) should be followed. The stop work procedure should be included within the Project’s construction management plan.

If any non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with [SWEMS0009](#).

Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location.

## 5.1.5 Noise and vibration

### Existing environment and potential impacts

#### *Existing environment*

The proposal is in a rural residential area with surrounding receivers including medium density residential properties, small businesses, educational facilities, places of worship and recreational areas. The closest residential receivers are within 20 metres of the proposed works on both sides of the alignment. The closest non-residential receiver is within 20 metres. The works will be contained to the road corridor.



Austral Public School (220 Edmondson Ave) is within 20 m of the proposal. School times are between 8:30 am and 3:30 pm Monday to Friday.

### Construction impacts

The proposal will generate noise during construction from site establishment, excavation and pipe laying, connection works, and site demobilisation. Work will generally occur during standard daytime hours.

The likelihood of noise impact was assessed using Table 2 of the Draft Construction Noise Guideline (EPA 2020). The review indicated that the likelihood of noise impact is medium to high risk and therefore a quantitative noise impact assessment was undertaken.

The works are of moderate duration (about 40 weeks) and a quantitative assessment has been completed. This identified that the works are likely have a potential impact on sensitive receivers. This includes construction activities, material and equipment deliveries, and compound operation.

The TfNSW Construction Noise Estimator (June, 2025) was used to determine the extent of noise impacts and appropriate mitigation measures. The following inputs were selected:

- Representative noise environment: R1
- Activity 1 – Distance based, using noisiest plant: Concrete saw
- Activity 2 – Distance based, using compound operation scenario
- Time period: standard day hours
- Propagation type: developed settlements.
- Line of site to all receivers

The outputs of the noise estimator are described in Table 5-5 and are presented in Figure 5-2 to Figure 5-5.

**Table 5-5 Noise assessment results – residential receivers**

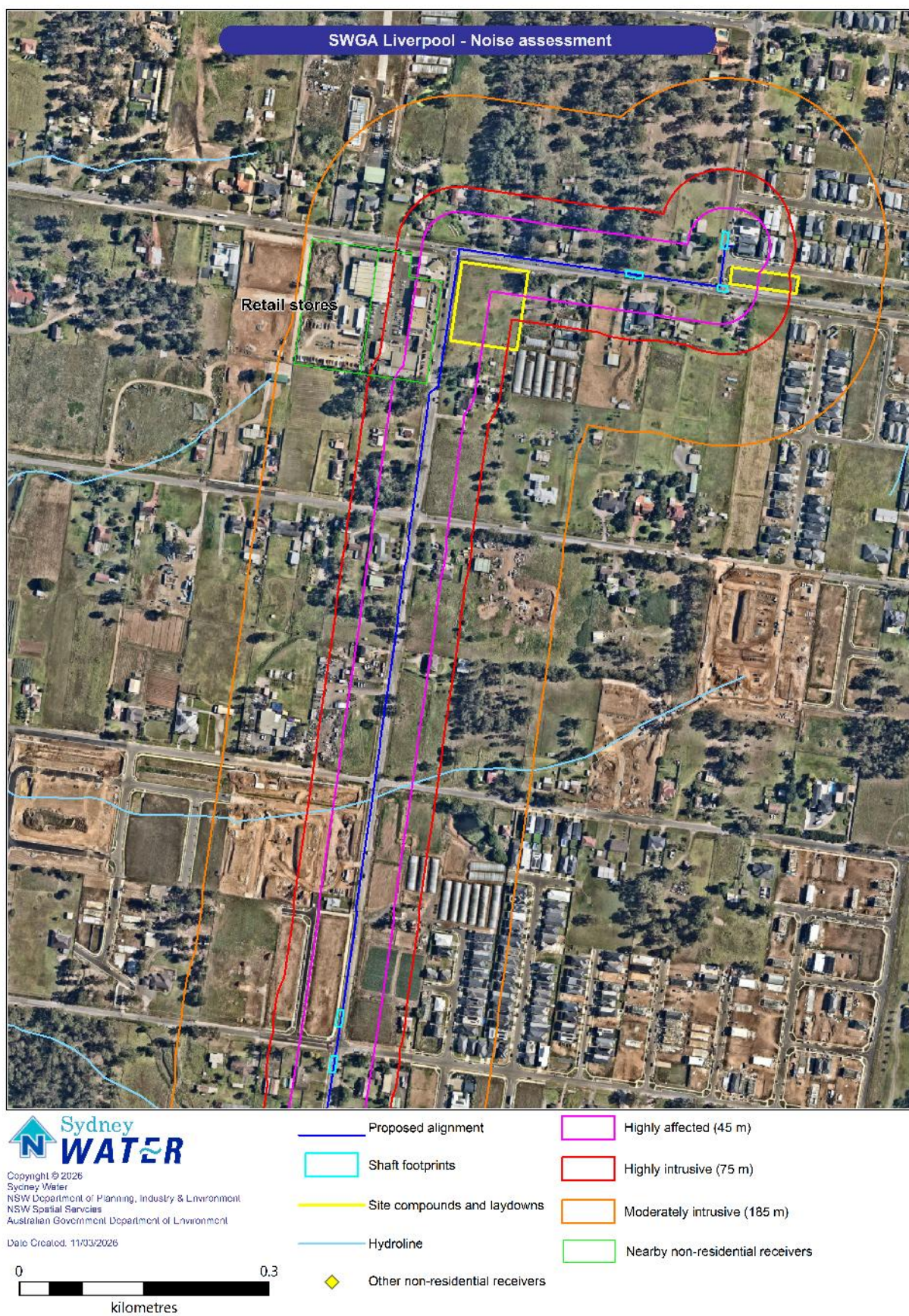
	<b><math>L_{Aeq}</math> (15 minute) noise level above background (<math>L_{A90}</math>)</b>					
	<b>20 to 30 dB(A)</b>		<b>&gt;30 dB(A)</b>		<b>75 dB(A) or greater (Highly affected)</b>	
	<b>Moderately intrusive</b>		<b>Highly intrusive</b>			
	<b>Within distance (m)</b>	<b>Measures</b>	<b>Within distance (m)</b>	<b>Measures</b>	<b>Within distance (m)</b>	<b>Measures</b>
<b>Activity 1</b>	185	N	75	N	45	N, PC, RO
<b>Activity 2</b>	165	N	60	N	30	N, PC, RO

The outputs of the noise estimator for non-residential receivers are described in Table 5-6. This scenario uses activity 1 noise levels as the worst-case scenario.

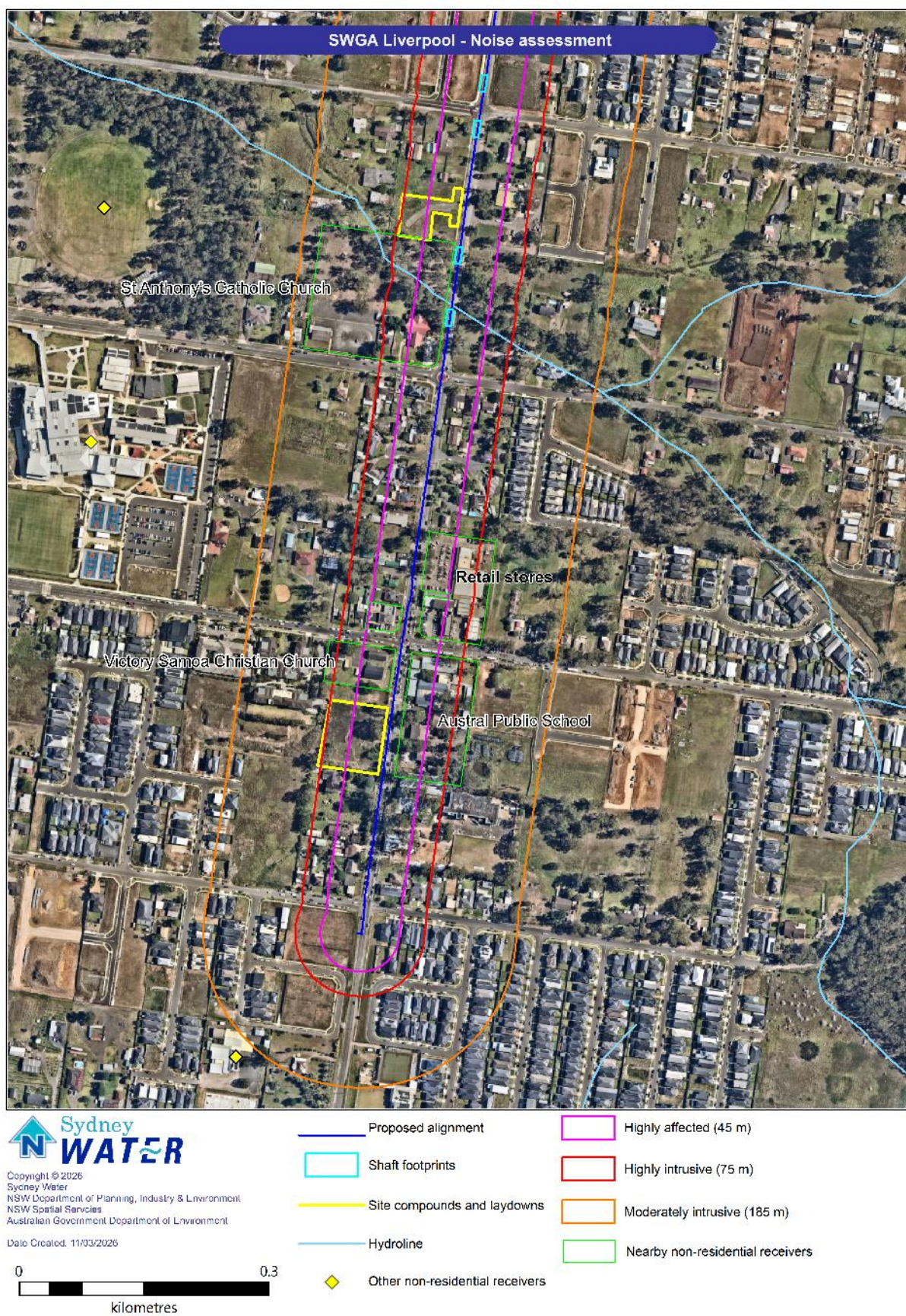


**Table 5-6 Noise assessment results – non-residential receivers**

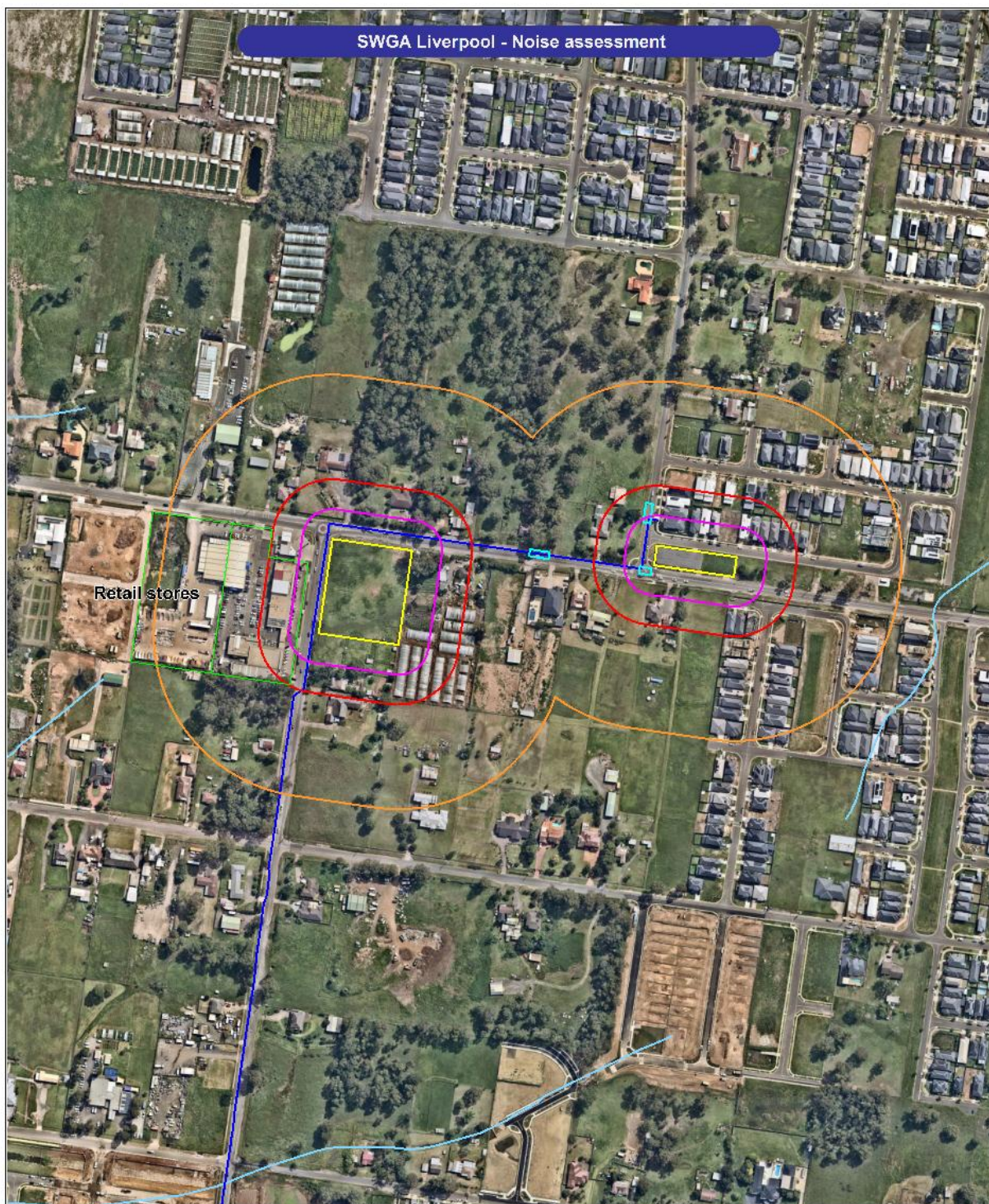
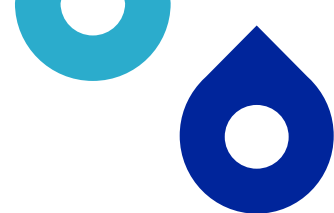
	<b>L<sub>Aeq</sub> (15 minute) noise level above NML</b>			
	<b>10 to 20 dB(A)</b>		<b>75 dB(A) or greater (Highly affected)</b>	
	<b>Within distance (m)</b>	<b>Measures</b>	<b>Within distance (m)</b>	<b>Measures</b>
<b>Education facilities</b>	120	N	45	N, PC, RO
<b>Place of worship</b>	120	N	45	N, PC, RO
<b>Passive recreation</b>	75	N	45	N, PC, RO
<b>Retail outlets</b>	-	-	45	N, PC, RO



**Figure 5-2 Activity 1 (North) noise assessment contours**



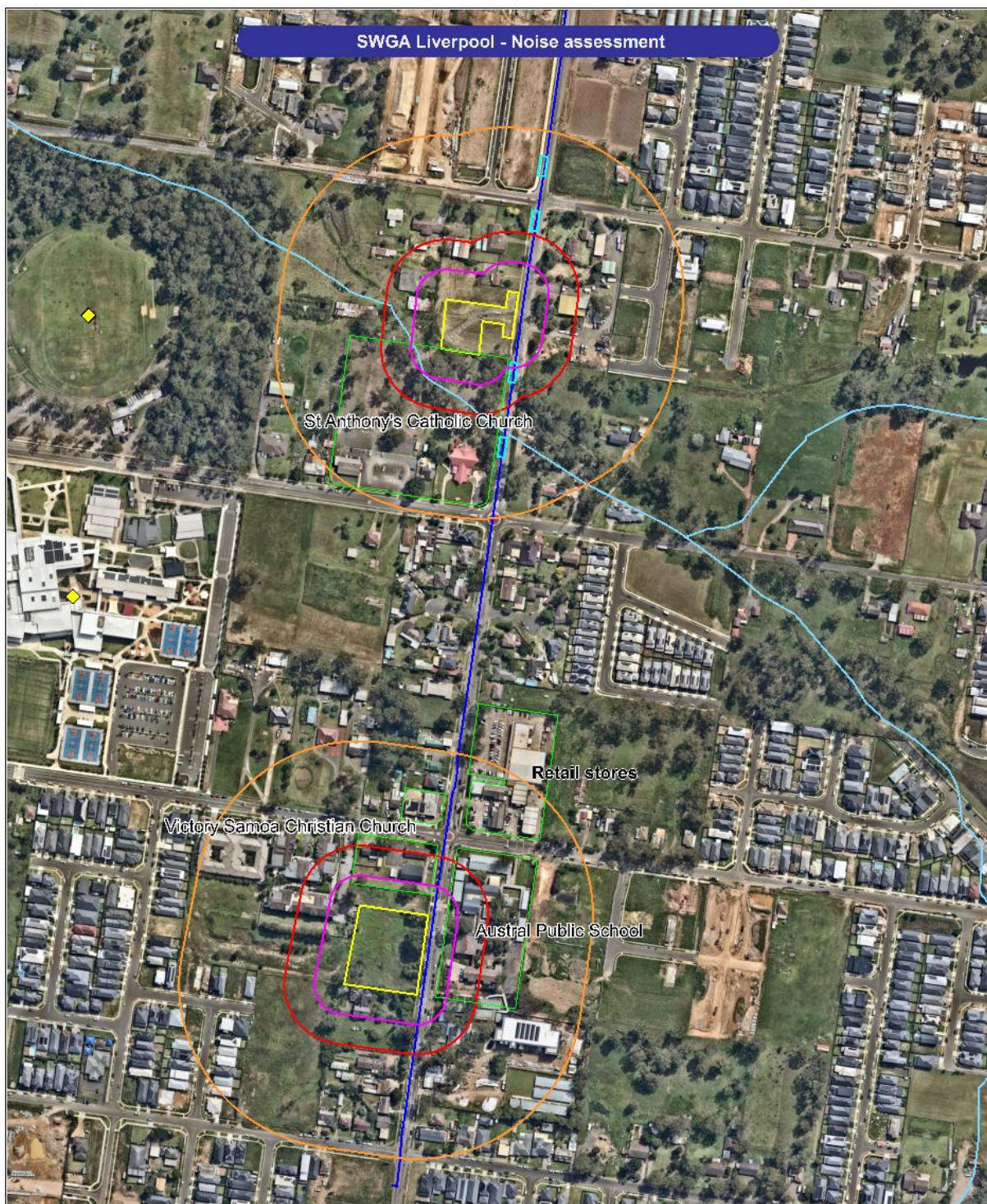
**Figure 5-3 Activity 1 (South) noise assessment contours**



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 NSW Spatial Services  
 Australian Government Department of Environment  
 Data Created: 31/03/2026

- Proposed alignment
- Shaft footprints
- Site compounds and laydowns
- Hydroline
- ◆ Non-residential receivers
- Highly affected (30 m)
- Highly intrusive (60m)
- Moderately intrusive (165 m)
- Nearby non-residential receivers

**Figure 5-4 Activity 2 (North) noise assessment contours**



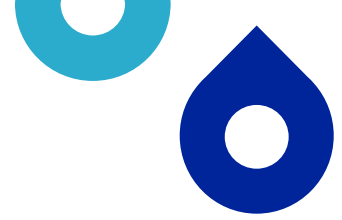
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 NSW Spatial Services  
 Australian Government Department of Environment

Data Created: 31/03/2026



- Proposed alignment
- Shaft footprints
- Site compounds and laydowns
- Hydroline
- Non-residential receivers
- Highly affected (30 m)
- Highly intrusive (60m)
- Moderately intrusive (165 m)
- Nearby non-residential receivers

**Figure 5-5 Activity 2 (South) noise assessment contours**



All residences along either side of the alignment are likely to be impacted by the proposed works. This includes all construction activities for the proposed alignment as well as operations within the site compounds/laydowns. The estimator has recommended the additional mitigation measure 'Notification' (N) to all receivers within the above noise contours. 'Phone calls' (PC) and 'Respite Offer' (RO) have also been recommended for sensitive receivers within the highly affected zones. As the works will be completed during standard construction work hours, and with the implementation of mitigation measures impacts to nearby receivers are anticipated to be minor.

High noise activities may cause disruption to nearby non-residential sensitive receivers including Austral Public School, and places of worship. Works between Ninth and Tenth Avenues should be scheduled to reduce impacts to the school. Consultation with nearby places of worship will also be undertaken to minimise impacts.

Construction activities may disrupt retailers and small businesses along Edmondson Avenue. Impacts would be of a temporary nature and would be managed under the mitigation measures.

The proposal will generate vibration during construction from equipment and machinery such as jackhammers and excavators. However, all sensitive receivers, including heritage structures, are outside the minimum working distance for these pieces of machinery. Therefore, vibration impacts are not anticipated.

#### *Operational impacts*

Following construction, the pipeline will be buried, and all disturbed surfaces reinstated to their pre-existing condition. No above-ground infrastructure or ongoing activities are proposed. Therefore, no operational impacts to noise and vibration are expected.

### **Mitigation measures**

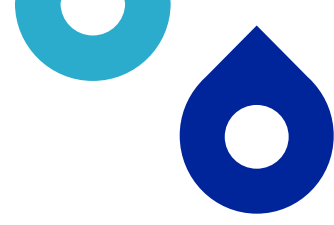
With the implementation of the mitigation measures below, impacts to noise and vibration can be adequately managed, and residual impacts are expected to be minor.

**Table 5-7 Environmental mitigation measures — noise and vibration**

<b>Mitigation measures</b>
<p>Works must comply with the EPA Construction Noise Guideline (Draft, 2021), including scheduling work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. No work to be scheduled on Sunday nights or public holidays. Any proposed work outside of these hours must be justified.</p> <p>The proposal will also be carried out in accordance with:</p> <ul style="list-style-type: none"><li>• Sydney Water's Noise Management Procedure SWEMS0056</li><li>• Noise Policy for Industry (EPA, 2017).</li></ul> <p>All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts.</p>

Incorporate standard daytime hours noise management safeguards into the CEMP, including but not limited to:

- Identify and consult with the potentially affected residents and other sensitive receivers prior to commencement of works. This should:



## Mitigation measures

- describe the nature of works, the expected noise impacts, approved hours of work, duration, complaints handling and contact details
  - determine need for, and appropriate timing of respite periods (eg times identified by the community that are less sensitive to noise such as mid-morning or mid-afternoon for works near residences).
- Implement a noise complaints handling procedure.
  - Do not warm-up plant or machinery near residential dwellings before the nominated working hours.
  - Select appropriate plant for each task, to minimise the noise impact (eg all stationary and mobile plant will be fitted with residential type silencers).
  - Do not use engine brakes when entering or leaving the work site(s) or within work areas.
  - Regularly inspect and maintain equipment in good working order.
  - Arrange work sites where possible to minimise noise (eg generators away from sensitive receivers, site set up to minimise use of vehicle reversing alarms, site amenities and/ or entrances away from noise sensitive receivers).
  - Use natural landforms/ mounds or site sheds as noise barriers.
  - Schedule noisy activities around times of surrounding high background noise (local road traffic or when other noise sources are active).

Construction works between Ninth and Tenth Avenues should, where practical, be scheduled outside of the school term to reduce impacts to Austral Public School.

Where works cannot be completed outside of the school term, the contractor must schedule high-noise activities outside of school times (8:30 am to 3:30 pm).

Consideration should be given to undertake noisy or disruptive work outside of standard hours.

Work schedule should be shared with Austral Public School and consultation will be ongoing.

If works **beyond standard daytime hours are needed (beyond those identified in this REF)**, the Delivery Contractor would:

- justify the need for out of hours work (OOHW) and why it is not possible to carry out the works during standard daytime hours
- consider potential noise impacts and implement the relevant standard daytime hours safeguards, follow Sydney Water's Noise Management Code of Behaviour (SWEMS0056.01) and document all reasonable and feasible management measures to be implemented
- identify additional community notification requirements and outcomes of targeted community consultation
- seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives.

Noise blankets and screens will be used where possible to reduce noise impacts to nearby receivers.

Minimise noise and vibration impacts where possible



## 5.1.6 Air quality

### Existing environment and potential impacts

The proposal is in a rural-residential area, with potential sensitive receivers including residents and nearby small businesses, places of worship and schools. Air quality within the study area is typical of a rural landscape with minimal sources of dust and odour. Nearby main roads such as Bringelly Road may cause fluctuation in air quality due to high traffic volumes during peak times.

#### *Construction impacts*

The proposal will potentially result in temporary impacts from:

- dust generated during excavations and earthworks
- dust generated by construction vehicles travelling on disturbed/ unsealed access routes
- emissions from construction machinery, equipment and vehicles.

These impacts are expected to be short-term and localised.

#### *Operational impacts*

Following construction, the pipeline will be buried, and all disturbed surfaces reinstated to their pre-existing condition. No above-ground infrastructure or ongoing emissions are proposed. Therefore, no operational impacts to air quality are expected.

### Mitigation measures

With the implementation of the mitigation measures below, impacts to air quality can be adequately managed, and residual impacts are expected to be minor.

**Table 5-8 Environmental mitigation measures — air and energy**

#### Mitigation measures

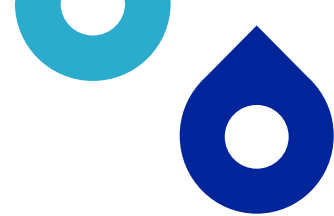
Maintain equipment in good working order, comply with the clean air regulations of the *Protection of the Environment Operations Act 1997*, have appropriate exhaust pollution controls, and meet Australian Standards for exhaust emissions.

Switch off vehicles/machinery when not in use.

Implement measures to prevent offsite dust impacts, for example:

- water exposed areas (using non-potable water source where possible such as water from excavation pits)
- cover exposed areas with tarpaulins or geotextile fabric
- modify or cease work in windy conditions
- modify site layout (place stockpiles away from sensitive receivers)
- vegetate exposed areas using appropriate seeding.

Cover all transported waste.



## 5.1.7 Waste and hazardous materials

### Existing environment and potential environmental impacts

One of our corporate objectives is to be a resource recovery business with an increasing portfolio of circular economy products and services. This includes reducing waste through recycling and re-use and encouraging our suppliers to minimise waste.

There are no known contaminated sites or contaminated land notified to the EPA within a 2-kilometre radius of the proposal. Unexpected contamination may be identified during excavation given the nature of the area (refer Section 5.1.1).

#### *Construction impacts*

The proposal will generate the following waste streams:

- spoil and excavated material
- general construction waste
- green waste from vegetation removal
- domestic waste from construction workers.

The contractor will seek opportunities to reduce, recycle and reuse materials. This will be documented in the Waste Management Plan or CEMP.

Waste from excavations will be stockpiled onsite at the nominated laydowns (refer to Figure 3-1). Improper management of waste and spoil can result in the off-site movement of material and the potential contamination of the surrounding land and waterways.

#### *Operational impacts*

Following construction, all excavations will be backfilled, the pipeline will be sealed and buried, and the road surface reinstated. All waste and hazardous materials associated with the proposal will be removed at the completion of works. Therefore, no operational impacts associated with waste and hazardous materials are expected.

### Mitigation measures

With the implementation of the mitigation measures below, impacts to waste can be adequately managed, and residual impacts are expected to be minor.

**Table 5-9 Environmental mitigation measures — waste and hazardous materials**

#### Mitigation measures

Prepare a Waste and Resource Recovery Plan (WRRP) to appropriately manage and classify any materials including soils, construction/demolition wastes and associated stockpiles

The plan will be prepared by the Delivery Contractor (or nominated environmental consultant) and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Contamination and Hazardous Materials team.

The WRRP should include:

## Mitigation measures

- expected waste types and their location
- delineation of waste /resource types including identification of likely vertical and lateral extents (where warranted)
- visual monitoring of materials during excavation and measures to be undertaken to prevent co-mingling / cross-contamination of waste / resource types
- ex-situ waste and resource recovery classification program, including timing relative to project / excavation phases as well as proposed hold points
- waste minimisation and resource recovery methodologies (including consideration of onsite reuse or management if contaminated)
- roles and responsibilities in relation to stockpile and material management and monitoring program
- proposed onsite reuse locations and reuse methodology (if applicable)
- proposed offsite reuse, offsite recycling and / or offsite disposal locations / facilities
- legislative compliance requirements
- consideration of future maintenance
- restoration.

Manage waste in accordance with relevant legislation and maintain records to show compliance eg waste register, transport and disposal records. Record and submit [SWEMS0015.27 Contractor Waste Report](#).

Provide adequate bins for general waste, hazardous waste and recyclable materials.

Minimise stockpile size and ensure delineation between different stockpiled materials.

Minimise the generation of waste and sort waste streams to maximise reuse/recycling in accordance with the legislative requirements.

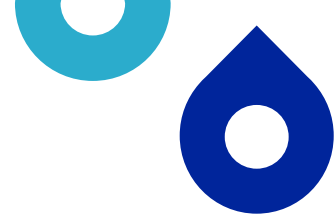
Manage waste and excess spoil in accordance with the NSW EPA Resource Recovery Orders and Exemptions (if applicable) and / or Waste Classification Guidelines. Where materials are not suitable or cannot be reused onsite or offsite, recycle where appropriate. Recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.

## 5.1.8 Traffic and access

### Existing environment and potential impacts

The proposal is:

- on Edmondson Avenue, a regional road
- on Fifteenth Avenue and Craik Avenue, both local roads
- within 20 metres of Austral Public School
- accessed via Ninth Avenue, Tenth Avenue, Eleventh Avenue, Twelfth Avenue, Thirteenth Avenue, Fourteenth Avenue and Fifteenth Avenue.



The proposal is not

- within 100m of a TfNSW road
- within 100m of a traffic signal.

#### *Construction impacts*

The proposal will require light and heavy vehicle movements during construction. This includes material and equipment deliveries, worker movements and equipment operation.

Construction of the proposal will be contained to the road corridor, taking up one lane of traffic, the road shoulder and road verge. Traffic control would manage traffic flow along the open lane.

Partial temporary road closures are required. A road occupancy licence and notification will be required. The proposal will impact access to private properties adjacent to the works during construction. Street parking will be temporarily impacted during the works due to presence of construction equipment and activities. Consultation with landowners will be ongoing (refer Section 3.4) to manage access and access will be restored outside of construction hours.

Construction activities may cause disruption to Austral Public School. Impacts include reduced street parking and increased congestion from partial road closures, especially during school pick up and drop offs. Works between Ninth and Tenth Avenues should be scheduled to reduce impacts to the school.

Construction activities may impact retailers and small businesses on the west corner of Fifteenth Avenue and Edmondson Avenue as well as the corner of Edmondson Avenue and Tenth Avenue. Access to carparks would be maintained via alternate entrances. These impacts would be of a temporary nature and would be managed under the mitigation measures.

Construction activities may cause disruptions to bus stops along and pedestrian access along Edmondson Avenue. Impacts are anticipated to be temporary as the works will move progressively along the route and individual properties would not be impacted for the entire construction period.

Consultation with council will be ongoing to manage traffic and access impacts.

#### *Operational impacts*

Following construction, all excavations will be backfilled, the pipeline will be sealed and buried, and the road surface reinstated. Therefore, no operational impacts to traffic and access are expected. Vehicle movements during operation are generally not expected, except as required for maintenance activities.

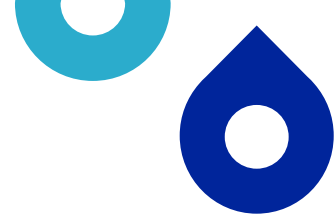
### **Mitigation measures**

With the implementation of the mitigation measures below, impacts to traffic and access can be adequately managed, and residual impacts are expected to be minor.

**Table 5-10 Environmental mitigation measures — traffic and access**

#### **Mitigation measures**

Prepare a Traffic Management Plan (TMP) in consultation with the relevant traffic authority.  
Meet NSW Roads and Maritime Service's Traffic Control at Worksites Manual v5 requirements for TfNSW roads. The Delivery Contractor will obtain a Road Occupancy Licence (ROL) from TfNSW, including if works are within 100m of traffic signals when construction commences.



## Mitigation measures

The TMP must incorporate management measures for bus stops along the alignment as well as access to private properties on Edmondson Avenue and Fifteenth Avenue.

TMP must consider management of traffic and access impacts to Austral Public School.

Develop management measure to minimise traffic impacts near residential properties, schools and businesses by consulting with them (e.g. no major materials deliveries at school drop off or pick up times etc).

Construction works between Ninth and Tenth Avenues should, where practical, be scheduled outside of the school term to reduce impacts to Austral Public School.

Consideration should be given to undertake disruptive work outside of school hours.

Work schedule should be shared with Austral Public School and consultation will be ongoing.

Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycle, pram and wheelchair access.

Consult with the relevant traffic authority about managing impacts to pedestrian traffic, signposting, metres, parking, line-marking or if traffic control or pavement restoration is required.

Erect signs to inform road users of the proposed works and any temporary road closures.

Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility or business access unless necessary and only if appropriate notification has been provided.

## 5.1.9 Social and visual

### Existing environment and potential impacts

The proposal is in a rural town centre surrounded by low and medium density residences, small businesses and educational facilities. Other construction activities and earthworks are currently ongoing within various lots along Edmondson Road (refer to Section 5.1.10).

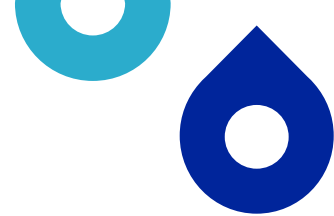
#### *Construction impacts*

Temporary visual impacts associated with site compounds and worksites during construction are expected. Compounds and laydowns will be fenced off; however, the presence of construction equipment and materials may impact visual amenity. Noise and traffic impacts would also impact social amenity due to noisy works and restricted access to adjacent properties. Impacts will be managed with mitigation measures in sections 5.1.5 and 5.1.8.

The temporary visual impacts will be mitigated in consultation with stakeholders such as council and residents, in accordance with the mitigation measures below.

#### *Operational impacts*

The proposal will not require new permanent above ground structures and will not alter the visual character of the environment over the long-term. Following construction, all excavations will be backfilled, the pipeline will be sealed and buried, and the road surface reinstated. As such, no operational impacts to social and visual aspects are anticipated.



## Mitigation measures

With the implementation of the mitigation measures below, impacts to social and visual amenity can be adequately managed, and residual impacts are expected to be minor.

**Table 5-11 Environmental mitigation measures — social and visual**

Mitigation measures
Undertake works in accordance with Sydney Water Communications policies and requirements including: <ul style="list-style-type: none"><li>• notify impacted residents and businesses</li><li>• erect signs to inform the public on nature of work</li><li>• treat community enquiries appropriately.</li></ul>
Restore work sites to pre-existing condition or better.
Minimise visual impacts (e.g. retain existing vegetation where possible).
Maintain work areas in a clean and tidy condition.

### 5.1.10 Cumulative and future trends

#### Potential environmental impacts

Other works close by include the Fifteenth Avenue Road Upgrades by TfNSW – Stage 2 (TfNSW). However, the proposal is expected to be completed prior to these works commencing and cumulative impacts are not expected. Ongoing consultation with TfNSW has been undertaken. The design has incorporated various recommendations including ensuring the pipeline is outside of major development locations where possible, and the pipeline is deep enough to not impede road construction. Sydney Water will continue to work with TfNSW to reduce impacts as required.

A review of the Liverpool City Council website identified other local developments occurring along Edmondson Avenue and in the surrounding area. Cumulative impacts may occur from increased traffic from construction vehicles as well as dust and noise from construction activities. Sydney Water will continue to work with council to reduce cumulative impacts where possible.

Future trends that could impact the proposal were considered, such as bushfires, coastal hazards, flooding, extreme heat and extreme storm events related to climate change.

The proposal has considered future trends and is unlikely to further exacerbate them. The proposal has been developed to account for urban growth in the surrounding area. As the proposal would be buried and sealed once complete, climate related impacts are not anticipated.

Following construction, all excavations will be backfilled, the pipeline will be sealed and buried, and the road surface reinstated. Therefore, no operational cumulative impacts are expected.



## Mitigation measures

With the implementation of the mitigation measures below, impacts from cumulative impacts can be adequately managed, and residual impacts are expected to be minor.

**Table 5-12 Environmental mitigation measures — cumulative and future trends**

### Mitigation measures

Consultation with Transport for NSW will continue throughout the duration of the project to ensure any potential cumulative impacts are reduced where possible.

Consultation with Council will continue throughout the duration of the project to ensure any potential cumulative impacts are reduced where possible.

## 5.1.11 General environmental management

**Table 5-13 Environmental mitigation measures — general environmental management**

### Mitigation measures

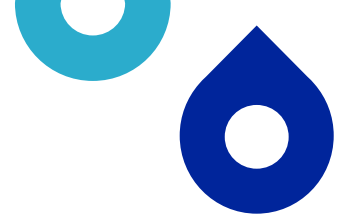
Sydney Water's Project Manager (after consultation with the environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities:

- limit proximity to sensitive receivers
- do not disrupt property access
- have no impact on known items of non-Aboriginal and Aboriginal heritage
- are outside high-risk areas for Aboriginal heritage
- use existing cleared areas and existing access tracks
- have no impacts to remnant native vegetation or key habitat features
- have no disturbance to waterways
- do not require additional mitigation measures beyond those included in the REF
- do not disturb contaminated land or acid sulfate soils
- will be rehabilitated at the end of construction.

The Delivery Contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment.

The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.

Should the proposal change from the REF, no further environmental assessment is required provided the change:



## Mitigation measures

- remains within the proposal area for the REF and has no net additional environmental impact or
- is outside the proposal area for the REF but:
- reduces impacts to biodiversity, heritage or human amenity or
- avoids engineering (for example, geological, topographical) constraints and
- after consultation with any potentially affected landowners and relevant agencies.

The Delivery Contractor must demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager in consultation with the environmental and community representatives.

Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this REF. The CEMP should specify license, approval and notification requirements. Prior to the start of work, all project staff and contractors will be inducted in the CEMP.

The CEMP must be readily available on site and include a site plan which shows:

- go/no go areas and boundaries of the proposal area including locations of lay-down and storage areas for materials and equipment
- location of environmental controls (such as erosion and sediment controls, fences or other measures to protect vegetation or fauna, spill kits)
- location and full extent of any vegetation disturbance.

The CEMP will identify appropriate delineation with (e.g. metal fencing for AHIMS, white flagging for construction corridor, red flagging for no go zones etc). Delineate approved disturbance boundary (or use EIA terminology) before construction.



## 6. Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of the South West Growth Area (SWGA), Drinking Water Infrastructure Augmentation in Austral, Liverpool. The proposal is required to service proposed urban growth forecast in the Austral and Leppington North growth precinct.

The main potential construction environmental impacts of the proposal include impacts to biodiversity, noise, traffic and heritage. Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF, the proposal is unlikely to have a significant impact on the environment. Therefore, an environmental impact statement is not required under Division 5.1 of the EP&A Act.

The REF considers how the proposal aligns with the principles of ESD. The proposal will result in positive long-term environmental improvements. The proposal will not result in the degradation of the quality of the environment and will not pose a risk to the safety of the environment.

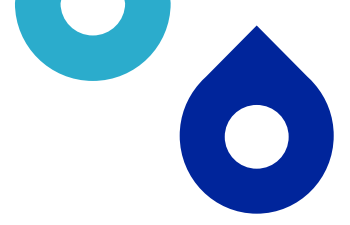


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EPA (NSW Environment Protection Authority) (2020) *Draft Construction Noise Guideline*, EPA website, accessed 13 January 2026.

Pentium Water (2025) Hydrogeological assessment, SWGA Austral – Liverpool Drinking Water Service, Pentium Water Pty Ltd.

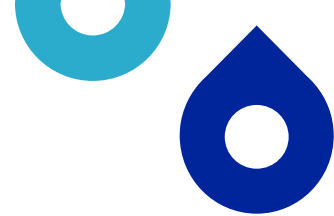


# Appendices

# Appendix A – Section 171 checklist and Section 171A checklist

## Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be short-term impacts on the community from noise, traffic and access due to construction. The proposal will provide long-term environmental benefits by delivering a reliable water service to the local community.
Any transformation of a locality	The proposal will not result in the transformation of a locality. The locality will be temporarily impacted during construction, but the pipeline will be buried upon completion and the area will be returned to its pre-construction condition.
Any environmental impact on the ecosystems of the locality	The proposal will result in minor environmental impacts to local ecosystems. The flora and fauna assessment determined that most impacts will be in certified areas. Biodiversity impacts in non-certified areas would be indirect and would be managed through the mitigation measures in Section 5.1.3. The proposal will ultimately support environmental outcomes by providing reliable water services, minimising any potential impacts on the ecosystem.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal will not reduce these factors. Any visual impacts will be temporary.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal will not affect these values. Several AHIMS sites occur nearby; however, the AHDD determined they are outside the proposal footprint. <div style="background-color: black; height: 15px; width: 100%;"></div> <div style="background-color: black; height: 15px; width: 100%;"></div> <div style="background-color: black; height: 15px; width: 100%;"></div> <p>■ The AHDD also determined that the archaeological potential of the proposal area is low due to previous disturbance.</p>
Any impact on the habitat of any protected animals (within the meaning of the <i>Biodiversity Conservation Act 2016</i> )	The majority of the proposal is located on certified land, with the exception of the area around the unnamed tributary of Kemps Creek. As works will remain within the road corridor (except for compounds), impacts to fauna habitat are unlikely.



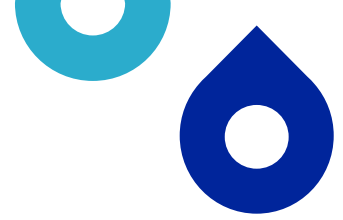
Section 171 checklist	REF finding
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not endanger any species. No direct impacts to flora or fauna are anticipated outside of certified areas, and any indirect impacts will be managed through the mitigation measures in Section 5.1.3.
Any long-term effects on the environment	The proposal will not have long-term adverse effects on the environment. It will provide long-term benefits through improved reliability of the water service.
Any degradation of the quality of the environment	The proposal will maintain the quality of the environment.
Any risk to the safety of the environment	The proposal will not pose a risk to environmental safety. Construction traffic will temporarily increase traffic movements; however, traffic control measures will be implemented during partial road closures on Edmondson Avenue, Fifteenth Avenue and Craik Avenue.
Any reduction in the range of beneficial uses of the environment	The proposal will maintain the range of beneficial environmental uses.
Any pollution of the environment	Environmental mitigation measures will prevent pollution. No pollution of the environment is expected.
Any environmental problems associated with the disposal of waste	Waste will be managed in accordance with the environmental mitigation measures. No environmental problems associated with waste disposal are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not affect demand on resources.
Any cumulative environmental effect with other existing or likely future activities	Nearby projects have been considered and there may be minor cumulative impacts due to increased vehicle traffic and construction related noise and emissions. Ongoing consultation with project managers for these projects to coordinate activities would ameliorate any potential impacts.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposal will not have any impact on these factors.



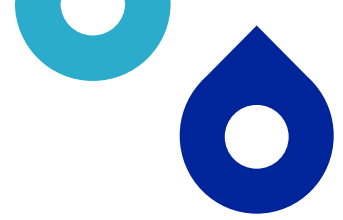
Section 171 checklist	REF finding
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	Providing a water service contributes to strategic plans for the South West Growth Centre including: <ul style="list-style-type: none"><li>• South West Growth Centre, Updated Structure Plan</li><li>• ‘Connected Liverpool 2040’ Liverpool City Council’s Local Strategic Planning Statement.</li></ul>
Any other relevant environmental factors.	The proposal has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

## Section 171A checklist

Biodiversity and Conservation SEPP Section		Yes	N/A
<b>Regulated Catchments</b>			
<b>Water quality and quantity</b>			
<b>6.6 (1)</b>	Has Sydney Water considered:		
	(a) whether the development will have a neutral or beneficial effect on the quality of water entering a waterway	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(b) whether the development will have an adverse impact on water flow in a natural waterbody	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(c) whether the development will increase the amount of stormwater run-off from a site	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(d) whether the development will incorporate on-site stormwater retention, infiltration or reuse	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(e) the impact of the development on the level and quality of the water table	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(f) the cumulative environmental impact of the development on the regulated catchment	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(g) whether the development makes adequate provision to protect the quality and quantity of ground water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>6.6 (2)</b>	Is Sydney Water satisfied that:		
	(a) the effect on the quality of water entering a natural waterbody will be as close as possible to neutral or beneficial, and	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(b) the impact on water flow in a natural waterbody will be minimised.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Aquatic ecology</b>			
<b>6.7 (1)</b>	Has Sydney Water considered:		
	(a) whether the development will have a direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation,	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	(b) whether the development involves the clearing of riparian vegetation and, if so, whether the development will require—		



	(i) a controlled activity approval under the <a href="#">Water Management Act 2000</a> , or	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(ii) a permit under the <a href="#">Fisheries Management Act 1994</a> ,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(c) whether the development will minimise or avoid—		
	(i) the erosion of land abutting a natural waterbody, or	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	(ii) the sedimentation of a natural waterbody,	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	(d) whether the development will have an adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(e) whether the development includes adequate safeguards and rehabilitation measures to protect aquatic ecology,	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	(f) if the development site adjoins a natural waterbody— whether additional measures are required to ensure a neutral or beneficial effect on the water quality of the waterbody.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>6.7 (2)</b>	Is Sydney Water satisfied that:		
	(a) the direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation will be kept to the minimum necessary for the carrying out of the development,	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	(b) the development will not have a direct, indirect or cumulative adverse impact on aquatic reserves,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(c) if a controlled activity approval under the <a href="#">Water Management Act 2000</a> or a permit under the <a href="#">Fisheries Management Act 1994</a> is required in relation to the clearing of riparian vegetation—the approval or permit has been obtained,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(d) the erosion of land abutting a natural waterbody or the sedimentation of a natural waterbody will be minimised,	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	(e) the adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area will be minimised.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Flooding</b>			
<b>6.8 (1)</b>	Has Sydney Water considered:		
	The likely impact of the development on periodic flooding that benefits wetlands and other riverine ecosystems?	<input checked="" type="checkbox"/>	<input type="checkbox"/>



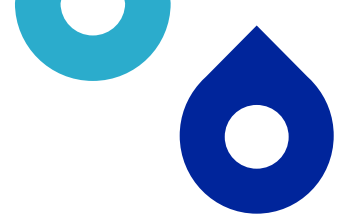
<b>6.8 (2)</b>	Are the works on flood liable land? If yes, is Sydney Water satisfied that the development will not:		
	(a) if there is a flood, result in a release of pollutants that may have an adverse impact on the water quality of a natural waterbody, or	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(b) have an adverse impact on the natural recession of floodwaters into wetlands and other riverine ecosystems.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Recreation and public access</b>			
Note: This section (6.9) does not apply if the works are in a special area under the <i>Water NSW Act 2014</i> .			
<b>6.9 (1)</b>	Has Sydney Water considered:		
	(a) the likely impact of the development on recreational land uses in the regulated catchment, and	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(b) whether the development will maintain or improve public access to and around foreshores without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>6.9 (2)</b>	Is Sydney Water satisfied:		
	(a) the development will maintain or improve public access to and from natural waterbodies for recreational purposes, including fishing, swimming and boating, without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(b) new or existing points of public access between natural waterbodies and the site of the development will be stable and safe,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(c) if land forming part of the foreshore of a natural waterbody will be made available for public access as a result of the development but is not in public ownership—public access to and use of the land will be safeguarded.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Sydney Drinking Water Catchment</b>			
Note: Section 6.6 (1) (a) or 6.6 (2) (a) does not apply if the activity is in the Sydney Drinking Water Catchment.			
171A (3)	For works in the Sydney Drinking Water Catchment, has Sydney Water also taken into account whether the activity:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(i) will have a neutral or beneficial effect on water quality, and		



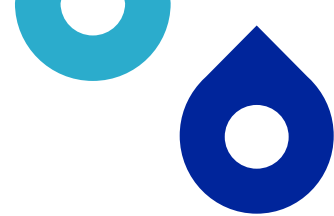
	(ii) is consistent with the NorBE Guideline within the meaning of <a href="#">State Environmental Planning Policy (Biodiversity and Conservation) 2021</a> , Part 6.5		
<b>Sydney Harbour Catchment</b>			
<b>6.28 (1)</b>	Has Sydney Water considered:		
	(a) whether the development is consistent with the following principles— (i) Sydney Harbour is a public resource, owned by the public, to be protected for the public good, (ii) the public good has precedence over the private good, (iii) the protection of the natural assets of Sydney Harbour has precedence over all other interests,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(b) whether the development will promote the equitable use of the Foreshores and Waterways Area, including use by passive recreation craft,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(c) whether the development will have an adverse impact on the Foreshores and Waterways Area, including on commercial and recreational uses of the Foreshores and Waterways Area,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(d) whether the development promotes water-dependent land uses over other land uses,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(e) whether the development will minimise risk to the development from rising sea levels or changing flood patterns as a result of climate change,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(f) whether the development will protect or reinstate natural intertidal foreshore areas, natural landforms and native vegetation,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(g) whether the development protects or enhances terrestrial and aquatic species, populations and ecological communities, including by avoiding physical damage to or shading of aquatic vegetation,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	(h) whether the development will protect, maintain or rehabilitate watercourses, wetlands, riparian lands, remnant vegetation and ecological connectivity.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# Appendix B – Consideration of TISEPP consultation

TISEPP section	Yes	No
<b>Section 2.10, council related infrastructure or services – consultation with council</b>		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		X
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		X
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		X
Connect to, and use a substantial volume of water from a council owned water supply system?		X
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?	X	
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?	X	
<b>Section 2.11, local heritage – consultation with council</b>		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		X
<b>Section 2.12, flood liable land – consultation with council</b>		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		X
<b>Section 2.13, flood liable land – consultation with State Emergency Services</b>		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance?  * (e) Div.14 (Public admin buildings), (g) Div.16 (Research/ monitoring stations), (i) Div.20 (Stormwater systems)?		X
<b>Section 2.14, development with impacts on certain land within the coastal zone– council consultation</b>		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		X
<b>Section 2.15, consultation with public authorities other than councils</b>		
Will the proposal be on land adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> or land acquired under Part 11 of that Act? <i>If so, consult with DPE (NPWS).</i>		X
Will the proposal be on land in Zone C1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? <i>If so, consult with DPE (NPWS).</i>		X



TISEPP section	Yes	No
Will the proposal include a fixed or floating structure in or over navigable waters? <i>If so, consult TfNSW.</i>		X
Will the proposal be on land in a mine subsidence district within the meaning of the <i>Coal Mine Subsidence Compensation Act 2017</i> ? <i>If so, consult with Subsidence Advisory NSW.</i>		X
Will the proposal be on land in a Western City operational area specified in <i>the Western Parkland City Authority Act 2018</i> , Schedule 2 and have a capital investment value of \$30 million or more? <i>If so, consult the Western Parkland City Authority.</i>	X	
Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? <i>If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).</i>		X



# Appendix C – Flora and Fauna assessment



**SWG A Austral Leppington Drinking Water Infrastructure Augmentation**

## Flora and fauna assessment

Prepared for Sydney Water

19 February 2026

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- NSW Department of Climate Change, Energy, the Environment and Water for access to the BioNet Atlas of NSW Wildlife.
- NSW Department of Primary Industries Fisheries for access to the predicted distribution maps for threatened species and fish communities.

Biosis staff involved in this project were:

- Jake Schwebel and Natasha Zahra (assistance in the field).
- Jenny Beckius (GIS mapping).

*Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.*

*We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.*

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## Definitions

BC Act	<i>Biodiversity Conservation Act 2016</i>
Biosecurity Act	<i>Biosecurity Act 2015</i>
BOS	Biodiversity Offsets Scheme
CBD	Central Business District
CEEC	Critically Endangered Ecological Community
Cth DCCEEW	Australian Commonwealth Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	<i>Fisheries Management Act 1994</i>
GIS	Geographic Information System
KTP	Key Threatening Process
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Services
MNES	Matters of National Environmental Significance
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
PCT	Plant Community Type
SEPP	NSW State Environmental Planning Policy
SIC	Significant Impact Criteria
SIS	Species Impact Statement
Study area	Edmondson Avenue, between Ninth Avenue and Fifteenth Avenue, Austral.
TEC	Threatened Ecological Community
ToS	Test of Significance
WM Act	<i>Water Management Act 2000</i>

## Executive summary

---

Biosis Pty Ltd (Biosis) was engaged by Sydney Water to undertake a flora and fauna assessment to support the proposed upgrades to the DN500 drinking water pipeline (the project) in Austral and Liverpool, New South Wales (NSW). The project involves the installation of new pipeline infrastructure along Edmondson Avenue from Ninth Avenue to Fifteenth Avenue, continuing east towards Craik Avenue and terminating near 5 Craik Avenue (the study area). The proposed alignment includes six connections to the existing water network as well as tie-ins at both ends of the project (Figure 1).

The proposed works are fully contained within existing road corridors, including traffic lanes, road shoulders, verges, and footpaths. Construction will primarily be carried out using open trenching, with trenchless installation methods employed in areas of ecological sensitivity. This assessment considers both the direct impacts associated with the footprint of the works as well as potential indirect effects on adjacent habitats, including remnant woodland, riparian corridors, and roadside vegetation that support native flora and fauna.

The study area occurs within the Southwest Growth Centre (SWGEC) and is subject to the provisions included in the *State Environmental Planning Policy (Precincts – Western Parkland City) 2021* (Western Parkland City SEPP). The Western Parkland City SEPP adopted these provisions from the now repealed *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* (Sydney Regional Growth Centres SEPP). The study area is predominantly mapped as 'Existing Certified' land under the *Order to confer biodiversity certification on the State Environmental Planning Policy (Sydney Region Growth Centres) 2006* (DECCW 2007) (Biodiversity Certification Order). These areas are subject to strategic biodiversity certification under Part 8 of the NSW *Biodiversity Conservation Act 2016* (BC Act) and do not require formal biodiversity assessment under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the NSW BC Act. These areas do still require assessment under other biodiversity legislation such as the NSW *Fisheries Management Act 1994* (FM Act) and the NSW *Water Management Act 2000* (WM Act). A riparian corridor associated with the central creek in the southern section of the study area is mapped as existing non-certified land and still requires full assessment.

The objective of this flora and fauna assessment is to determine the presence of any threatened ecological communities (TECs) or potential habitat for threatened species within the study area and, where applicable, assess the impacts of the project on any threatened species, populations and/or ecological communities (entities), or their habitat, listed under the Commonwealth EPBC Act and the NSW BC Act.

### Ecology values within the study area

Key ecological values detected in the study area (which encompasses the impact area) as part of this assessment include:

- 0.70 ha of Plant Community Type (PCT) 3320 - Cumberland Shale Plains Woodland, associated with the following TECs:
  - *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* (Critically Endangered Ecological Community [CEEC], EPBC Act)
  - *Cumberland Plain Woodland in the Sydney Basin Bioregion* (CEEC, BC Act).
- 0.43 ha of PCT 4025 Cumberland Red Gum Riverflat Forest, associated with the following TECs:
  - *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* (CEEC, EPBC Act)

- *River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (Endangered Ecological Community [EEC], BC Act).
- Fauna habitat, including hollow bearing trees, waterways and marginal foraging resources.

The proposed works will not trigger the Biodiversity Offset Scheme (BOS) under the BC Act as described in Section 4.2 of this report. As consideration of the BOS is not warranted, a Biodiversity Development Assessment Report (BDAR) is not required.

## Recommendations

A suite of standard and site-specific environmental safeguards is recommended to minimise potential impacts associated with the proposed works. Sydney Water's standard safeguards (see section 5), developed through extensive project delivery experience, will be implemented across all locations and address key environmental risks including erosion and sediment control, water quality protection, vegetation management, fauna protection, and biosecurity. These measures are designed to ensure regulatory compliance and promote best-practice environmental management throughout construction.

In addition, the following project-specific safeguards are recommended to further reduce environmental risk:

- All stockpile and compound areas are to be located within existing cleared areas and existing access tracks and will be rehabilitated at the end of construction.
- All staff on site are to be educated on the ID characteristics of the threatened species identified as having a moderate likelihood of occurrence (see section 3.3) and advised to not handle fauna species under any circumstances during toolbox talks.
- No-go fencing installed for retained vegetation to ensure surrounding area remains undisturbed.

Collectively, these safeguards provide confidence that potential impacts to biodiversity values will be effectively avoided, minimised, and managed in accordance with legislative requirements and best-practice environmental management.

# 1 Introduction

---

## 1.1 Project background

Biosis Pty Ltd was commissioned by Sydney Water to undertake a flora and fauna assessment to support the proposed upgrades to the DN500 drinking water pipeline in Austral and Liverpool. The project will run along Edmondson Avenue from Ninth Avenue to Fifteenth Avenue, then continue east towards Craik Avenue, terminating near 5 Craik Avenue. The project involves cross connections to the existing water network in six locations along the alignment as well as tie-ins at both ends (Figure 1).

The entire project alignment will be contained within road corridors, which includes the traffic lanes, road shoulders, verges and footpaths. The alignment will be predominantly open trenched, with sections of trenchless installation in areas where ecological values are present. Therefore, all potential impacts to areas of biodiversity value will be of an indirect nature only.

The study area is wholly located within the SWGA as identified under Chapter 3 of the Western Parkland City SEPP. Under the Biodiversity Certification Order (DECCW 2007), areas mapped as existing certified land do not require formal biodiversity assessment under the Commonwealth EPBC Act or the NSW BC Act. These areas still require assessment under other biodiversity legislation including the FM Act and WM Act. Areas mapped as existing non-certified, required full assessment and all relevant biodiversity legislative instruments.

The works proposed to be undertaken will be assessed under Part 5, Division 5.1 of the NSW EP&A Act and this assessment will be used to inform a Review of Environmental Factors (REF) being prepared by Sydney Water.

## 1.2 Scope of assessment

The objective of this flora and fauna assessment is to determine the presence of any TECs or habitat for threatened species within the study area and, where applicable, assess the impacts of the project on any threatened species, populations and/or ecological communities (entities), or their habitat, listed under the Commonwealth EPBC Act and NSW BC Act.

This assessment addresses the following key components:

- Determine the presence of any threatened flora, fauna, populations or ecological communities (entities) within the study area.
- Review the implications of relevant biodiversity legislation and policy.
- Assess potential impacts on listed biodiversity values under the EPBC Act and BC Act within areas of existing non-certified land under the Western Parkland City SEPP.
- Assess potential impacts on biodiversity values under the FM Act, WM Act and other relevant legislative instruments within the broader study area.
- Identify potential implications of the proposed development and provide recommendations to assist with development design (focusing on avoiding and minimising impacts to biodiversity values).
- Recommend any further assessments of the site that may be required to support the development application process.

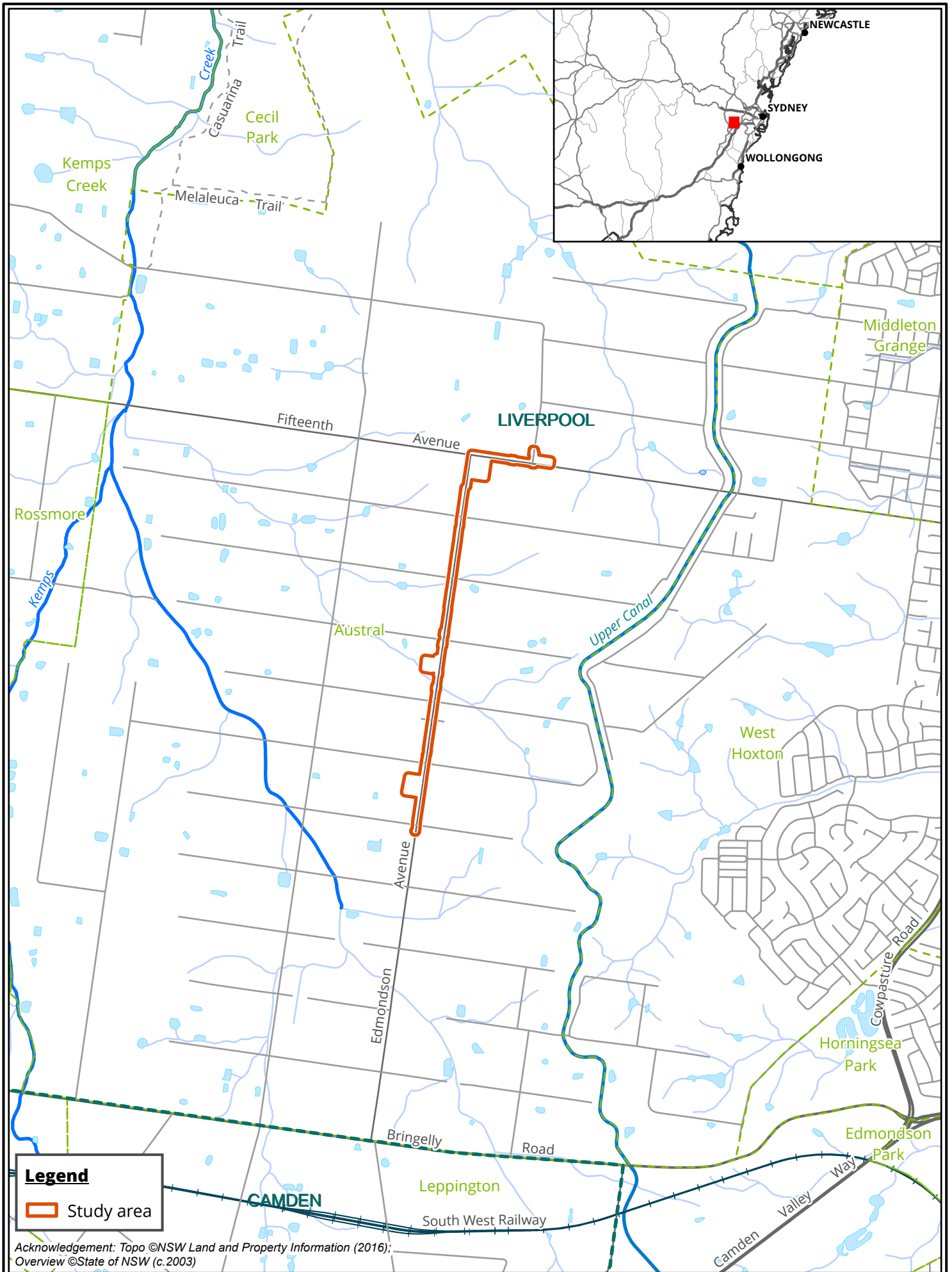
### 1.3 Location of the study area

The study area is located within the suburb of Austral and Liverpool approximately 12 kilometres west of Liverpool town centre and approximately 50 kilometres southwest of the Sydney Central Business District (CBD) (Figure 1). The study area encompasses 2.4 kilometres along Edmondson Ave, which includes a 10-metre buffer either side of the proposed alignment.

The surrounding land use primarily comprises residential housing and rural properties, with vegetation existing mainly as scattered patches. More intact vegetation is generally confined to areas along waterways, where remnant corridors have been retained.

The study area is within the:

- Greater Sydney Interim Biogeographic Regionalisation for Australia (IBRA) bioregion and Cumberland IBRA sub-region.
- Greater Sydney Local Land Services (LLS) Management Area.
- Liverpool Local Government Area (LGA).



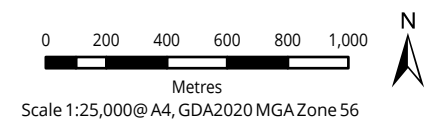
**Legend**  
 Study area

Acknowledgement: Topo ©NSW Land and Property Information (2016);  
 Overview ©State of NSW (c. 2003)



**Figure 1 Location of the study area**

Matter: 42407, Date: 27 January 2026,  
 Prepared for: MJS, Prepared by: LH, Last edited by: jbeckius  
 Location: P:\43000s\43045\mapping\43045\_SWGA\_Liverpool\_FFA  
 Layout: 43045\_F1\_Locality



## 2 Methods

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### 2.1 Database and literature review

Prior to completing the field investigation, information provided by Sydney Water as well as other key information was reviewed, including:

- Australian Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) Protected Matters Search Tool (PMST) for matters protected by the EPBC Act.
- NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) BioNet Atlas of NSW Wildlife, for items listed under the BC Act.
- The NSW Department of Primary Industries (DPI) Spatial Data Portal for FM Act listed threatened species, populations and communities.
- NSW DPI *Biosecurity Act 2015* for listed priority weeds for the Greater Sydney Local Land Services (LLS) area.
- Relevant vegetation mapping, including the NSW State Type Vegetation Map (SVTM C2.0M2.2) (NSW DCCEEW 2025a).

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Planning and Assessment Act 1979*
- *Biodiversity Conservation Act 2016*
- *Water Management Act 2000*.
- *Biosecurity Act 2015*.
- State Environmental Planning Policy (Biodiversity and Conservation) 2021.
- State Environmental Planning Policy (Precincts-Western Parkland City) 2021.
- Liverpool Local Environmental Plan 2008 (Liverpool LEP).
- Liverpool Development Control Plan 2008 (Liverpool DCP).

### 2.2 Field investigation

A field investigation of the study area was undertaken on 28 October 2025 by Jake Schwebel (Senior Botanist). Vegetation within the study area was surveyed using the random meander technique (Cropper 1993) over three person hours.

General classification of native vegetation in NSW used in this report is based on the classification system in Keith (2004) which uses three groupings of vegetation: vegetation formation, vegetation class and vegetation type, with vegetation type the finest grouping. The grouping referred to in this report is PCT as defined by the Biodiversity Assessment Method (BAM) (DPIE 2020) and has been the standard used across NSW since 2016.

The vegetation types, within the study area, were stratified into PCTs broadly based on previous vegetation mapping, and the vegetation boundaries marked with a hand-held GPS in the field. Appropriate PCTs were

selected on the basis of species composition and structure, known geographical distribution, landscape position, underlying geology, soil type, and any other diagnostic features.

A habitat-based assessment was completed to determine the presence of suitable habitat for threatened species previously recorded (DPE 2022) or predicted to occur (DCCEEW 2025) within 5 kilometres. This list was filtered according to species descriptions, life history, habitat preference and soil preference to determine those species most likely to be present within the study area.

### **2.2.1 Permits and licences**

The biodiversity assessment was conducted under the terms of Biosis' Scientific Licence issued by NSW DCCEEW under the BC Act (SL100758, expiry date 30 June 2026).

## 3 Results

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The study area is located within the suburb of Austral and Liverpool within a landscape that is primarily characterised by residential living. The broader locality comprises a mix of land uses, including public recreation areas and rural residential living.

Native vegetation within the study area is predominantly in low condition. Vegetated areas occur as narrow linear remnants along corridors which are influenced by adjacent land uses and infrastructure which have led to varying degrees of fragmentation, edge effects, and weed invasion. While some habitats are constrained by the limited size or connectivity of vegetation patches, they still provide connectivity to areas of higher-quality vegetation beyond the study area.

Regional soil landscape mapping indicates that the study area occurs on the Blacktown soil landscape of the Landscapes of the Penrith 1:100,000 Sheet map (Bannerman & Hazelton 1990). The Blacktown soils landscape is characterised by gently undulating rises on the Wianamatta Group Shales with a local relief of 10-30 metres and broad rounded crests and ridges with gently inclined slopes. The Blacktown soil landscape occurs extensively on the Cumberland Lowlands and comprises Ashfield Shale, Bringelly Shale and Minchinbury Sandstone. Vegetation associated with this soil landscape is almost completely cleared open forest and open woodland (dry sclerophyll forest). The dominant land uses are intensive residential, horticulture and animal husbandry.

### 3.1 Vegetation communities

The vegetation throughout the majority of the study area has been modified by past disturbances which have included historical clearing and weed ingress. Nonetheless, vegetation of the study area comprises of the following:

- PCT 3320 Cumberland Shale Plains Woodland which is associated with the following TECs:
  - *Cumberland Plain Woodland in the Sydney Basin Bioregion* (CEEC, BC Act).
  - *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* (CEEC, EPBC Act).
- PCT 4025 Cumberland Red Gum Riverflat Forest which is associated with the following TECs:
  - *River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (EEC, BC Act).
  - *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* (CEEC, EPBC Act).
- Urban native/exotic vegetation

A key focus of the field investigation was to assess the vegetation of the study area against the final determinations for the above listed TECs to determine presence or absence. The general structure, floristic composition, condition and conservation status of the PCTs are described in Table 1 to Table 3 below and displayed in Figure 2.

**Table 1 PCT 3320 within the study area**

Cumberland Shale Plains Woodland	
<b>PCT</b>	3320
<b>Extent within study area</b>	Approximately 0.70 ha of Cumberland Shale Plains Woodland was recorded within the study area. All patches of this community occurred within existing certified land.
<b>Condition</b>	This community was recorded in moderate, low and scattered trees condition states.
<b>Description</b>	<p>PCT 3320 was predominantly present within the northern portion of the study area, with only two low condition patches occurring in the south.</p> <p>Areas of PCT 3320 in a moderate condition state consisted of a canopy of Grey Box <i>Eucalyptus moluccana</i> and Forest Red Gum <i>Eucalyptus tereticornis</i>. The mid-storey was fairly sparse, however where present, consisted of a few scattered individuals of native Sweet Bursaria <i>Bursaria spinosa</i> and exotic African Boxthorn <i>Lycium ferocissimum</i>. Native species in the groundcover consisted of Kidney Weed <i>Dichondra repens</i> and Weeping Grass <i>Microlaena stipoides</i> var. <i>stipoides</i>. However, the understory was also heavily dominated by exotic African Love Grass <i>Eragrostis curvula</i>.</p> <p>Areas of low condition vegetation contained a similar species assemblage to that described above, but were characterised by a higher abundance of exotic weed species, including Purple Verbena <i>Verbena bonariensis</i>, Cobbler's Pegs <i>Bidens pilosa</i>, African Lovegrass, Kikuyu <i>Cenchrus clandestinus</i>, Paddy's Lucerne <i>Sida rhombifolia</i>, and Fireweed <i>Senecio madagascariensis</i>.</p> <p>Areas in a scattered-trees condition state consisted entirely of isolated canopy trees, primarily Grey Box and Forest Red Gum, with little to no understory or groundcover vegetation present. Groundcover vegetation in these areas was primarily dominated by African Lovegrass and Kikuyu.</p>
<b>Threatened ecological community</b>	<p><b>NSW BC Act:</b> All areas of PCT 3320 were determined to meet the criteria for the BC Act listed CEEC <i>Cumberland Plain Woodland in the Sydney Basin Bioregion</i>.</p> <p><b>Justification:</b> The community is present in the correct IBRA region, on the correct soil type, and contains a mix of the characteristic species detailed in Section 3 of the <i>Cumberland Plain Woodland Final Determination</i> (NSW Scientific Committee 2009).</p> <p><b>Commonwealth EPBC Act:</b> Moderate condition PCT 3320 within the study area is considered consistent with the associated EPBC Act listed <i>Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest</i> (CEEC, EPBC Act).</p> <p><b>Justification:</b> Moderate condition PCT 3320 is consistent with the CEEC as the vegetation state included the key characteristic species associated with the CEEC, and also satisfied the following condition thresholds for the listed community:</p> <ul style="list-style-type: none"> <li>• Native tree species within a minimum project foliage cover of 10%.</li> <li>• Patch size greater than 0.5 ha.</li> <li>• The native perennial understory comprises greater than 50% cover, in accordance with listing advice (Threatened Species Scientific Committee 2009).</li> </ul> <p>Low and scattered trees condition types were not associated within the EPBC Act community as they did not satisfy the required condition thresholds.</p>

**Cumberland Shale Plains Woodland**

**Photo**




**Photo 1 PCT 3320 in a moderate condition within the study area**




**Photo 2 PCT 3320 in a low condition within the study area**

**Table 2 PCT 4025 within the study area**

<b>Cumberland Red Gum Riverflat Forest</b>	
<b>PCT</b>	4025
<b>Extent within study area</b>	Approximately 0.43 ha of Cumberland Red Gum Riverflat Forest was recorded within the non-certified land within study area. All patches of this community occurred within existing non-certified land.

<b>Cumberland Red Gum Riverflat Forest</b>	
<b>Condition</b>	This community was recorded in a low condition state.
<b>Description</b>	<p>PCT 4025 in a low condition state consisted of a canopy of Forest Red Gum and Cabbage Gum <i>Eucalyptus amplifolia</i> with scattered occurrences of Grey Box and Broad-leaved Ironbark <i>Eucalyptus fibrosa</i>.</p> <p>The native mid-storey layer was largely absent, limited to scattered occurrences of Sweet Bursaria. Exotic species within the mid-storey consisted heavily of exotic Small-leaved Privet <i>Ligustrum sinense</i>. The ground layer was dominated by exotic grasses and forbs such as Kikuyu, African lovegrass, Common Couch <i>Cynodon dactylon</i> and White Clover <i>Trifolium repens</i>. Where present native species were limited to grasses and forb species such as Weeping Grass <i>Microlaena stipoides</i>, Kidney Weed, Twining Glycine <i>Glycine clandestina</i> and Berry Saltbush <i>Einadia hastata</i>.</p>
<b>Threatened ecological community</b>	<p><b>NSW BC Act:</b> PCT 4025 in low condition was determined to meet the criteria for the BC Act listed EEC <i>River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>.</p> <p><b>Justification:</b> The community is present in the correct IBRA region, on the correct soil type, and contains a mix of the characteristic species detailed in Section 1 of the <i>River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions - endangered ecological community Final Determination</i> (NSW Scientific Committee 2011).</p> <p><b>Commonwealth EPBC Act:</b> PCT 4025 within the non-certified area is not considered consistent with the associated EPBC Act listed <i>River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</i> (CEEC, EPBC Act).</p> <p><b>Justification:</b> PCT 4025 within the study area is not consistent with the CEEC as it does not meet the condition classes and thresholds for the ecological community listed in Table 4 of the Conservation advice for the <i>River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</i> (DCCEEW 2020). The understory layer was absent and the perennial understory was largely non-existent. Therefore, these areas do not meet the requirements of &gt;30% of perennial understorey and groundcover richness.</p>
<b>Photo</b>	
<b>Photo 3 PCT 4025 in a low condition within the study area</b>	

**Table 3 Urban Native/Exotic vegetation within the study area**

<b>PCT</b>	Not applicable. This vegetation is not consistent with a NSW PCT.
<b>Extent within study area</b>	Approximately 6.40 ha of Urban Native/Exotic vegetation was recorded within the study area, across both certified and non-certified land.
<b>Description</b>	<p>Areas of Urban Native/Exotic vegetation within the study area includes that which cannot be reasonably assigned to a PCT.</p> <p>Vegetation comprised of planted native trees (not consistent with a NSW PCT) and shrubs such as Tallowwood <i>Eucalyptus microcorys</i>, Spotted Gum <i>Corymbia maculata</i> and Weeping Bottlebrush <i>Callistemon viminalis</i>. Exotic vegetation is also included in this vegetation type which consisted of landscaped plantings such as Jacaranda <i>Jacaranda mimosifolia</i>, Lily of the Nile <i>Agapanthus</i> and Cocos Palm <i>Syagrus romanzoffiana</i>.</p>
<b>Photo</b>	 <p style="text-align: center;"><b>Photo 4 Urban native/ Exotic vegetation within the study area</b></p>

### 3.2 Aquatic habitats

One unnamed Strahler order two waterway was identified within the central portion of the study area (Photo 5) and is a tributary associated with Kemps Creek (Figure 2). Kemps Creek occurs approximately 950 metres to the west of the study area.

At the time of the field investigation, the waterway was absent of flowing water and showed no evidence of recent stream flow. It is therefore likely to be a seasonal/ephemeral waterway, typically dominated by isolated pools during nominal flow periods. The surrounding riparian zone was largely characterised by aquatic weed species Alligator Weed *Alternanthera philoxeroides* and exotic grasses Kikuyu *Cenchrus clandestinus* and African Lovegrass *Eragrostis curvula*.

Further discussion of these waterways, including relevant legislative considerations, is provided in sections 4.3 and 4.4.



**Photo 5 Unnamed Strahler order two waterway within the study area**

### 3.3 Threatened species

Background searches identified 30 threatened flora species and 64 threatened fauna species recorded (NSW DCCEEW 2025b) or predicted to occur (DCCEEW 2025) within 5 kilometres of the study area. As previously mentioned, the study area is located within the SWGA, as identified under Chapter 3 of the Western Parkland City SEPP. Under the Biodiversity Certification Order, areas mapped as existing certified land do not require formal biodiversity assessment under the BC Act or the EPBC Act.

While the majority of the study area occurs on existing certified land (Figure 3), approximately 0.29 hectares of native vegetation within the riparian corridor associated with the unnamed central creek in the southern section of the study area is mapped as existing non-certified land. The assessment of threatened species and their habitats provided below applies only to areas of existing non-certified land.

Species recorded or predicted to occur within five kilometres of the study area, and not listed below, are considered to have a negligible likelihood of occurrence due to the absence of suitable habitat within existing non-certified areas. This is primarily attributed to the highly modified nature of these areas, which are dominated by exotic pasture, disturbed road reserves, and edge-affected vegetation with limited structural complexity.

Those species considered most likely to have habitat within the existing non-certified areas, based on the background research, and the habitat values present, are as follows:

**Flora**

- Downy Wattle *Acacia pubescens* (Vulnerable, EPBC Act and BC Act).
- *Dillwynia tenuifolia* (Vulnerable, BC Act).
- *Pultenaea parviflora* (Vulnerable, EPBC Act and Endangered BC Act).

**Fauna**

- Cumberland Plain Land Snail *Meridolum corneovirens*, (Endangered, BC Act).
- Eastern Coastal Free-tailed Bat *Mormopterus norfolkensis* (Vulnerable, BC Act).
- Southern Myotis *Myotis macropus* (Vulnerable, BC Act).
- Grey-headed Flying-fox *Pteropus poliocephalus* (Vulnerable, EPBC and BC Act).

An assessment of the habitat values of the study area is provided in Table 4 for threatened flora species and Table 5 for threatened fauna species.

**Table 4 Assessment of habitat for threatened flora species (non-certified land)**

PCT and condition	Habitat requirements and likelihood of occurrence
<b>PCT 4025 Low</b>	This vegetation condition type provides a low likelihood of occurrence for threatened flora primarily due to the highly disturbed nature of the ground and midstory strata, as well as the fragmented and urbanised context of the study area and high weed ingress.
<b>Urban Native and Exotic vegetation</b>	This vegetation condition type provides a low likelihood of occurrence for threatened flora due to the disturbed nature of all stratum and absence of vegetation that pertains to a recognised PCT.

**Table 5 Assessment of habitat for threatened fauna species (non-certified land)**

Habitat feature	Threatened fauna association	Likelihood of occurrence and impact
<b>Feed trees</b>	Angophoras, Eucalypts, and other flowering perennial species likely to occur in the non-certified portions of the study area may provide nectar resources suitable for the Grey-headed Flying-fox whilst in flower.	<u>Grey Headed Flying Fox - Moderate likelihood of occurrence within Existing Non-Certified land and low likelihood of impacts by the proposed works.</u> The closest record of this species was 800 m from the study area with 92 records within 5 km. The closest camp is in Macquarie Park, which is roughly 9 km away. While this highly mobile and transient species may occasionally forage within the study area, the extent and quality of foraging resources are limited. As such, the proposed works are unlikely to result in a measurable impact on the species or its foraging habitat.

Habitat feature	Threatened fauna association	Likelihood of occurrence and impact
<b>Hollow-bearing trees</b>	Three hollow-bearing trees (HBTs) occur within the non-certified land of the study area. However, they will not be impacted.	<u>Eastern Coastal Free-tailed Bat - Moderate likelihood of occurrence within Existing Non-Certified land and low likelihood of impacts by the proposed works.</u> The closest record occurs 1.4 km from the study area, with 19 records within 5 km of the study area. The species is known to roost in hollows of large mature eucalypts. No hollow bearing trees will be impacted, and as such, the proposed works are unlikely to result in a measurable impact on the species. <u>Southern Myotis – Low likelihood of occurrence within Existing Non-Certified land and low likelihood of impacts by the proposed works.</u> The closest record occurs approximately 2 km from the study area, with 20 records within 5 km of the study area. This species is known to roost within tree hollows close to water bodies. No hollow bearing trees will be impacted, and as such, the proposed works are unlikely to result in a measurable impact on the species.
<b>Rocky outcrops</b>	No rocky outcrops which could provide roosting habitat for bats were found within the study area.	Not applicable.
<b>Waterways (creek, river or dam)</b>	One Strahler Order 2 waterway was identified in the central portion of the study area. Waterways have the potential to provide foraging habitat for Southern Myotis.	<u>Southern Myotis – Moderate likelihood of occurrence within Existing Non-Certified land and low likelihood of impacts by the proposed works.</u> The Southern Myotis forages within aquatic environments for insects and small fish. However, no waterways will be impacted by the proposed works.
<b>Logs, debris, leaf and bark</b>	The Cumberland Plain vegetation community occurs within sections of the study area which are highly likely to contain logs, debris, leaf and bark which presents suitable habitat for the Cumberland Plain Land Snail.	<u>Cumberland Plain Land Snail – Moderate likelihood of occurrence and impact.</u> The closest record is approximately 600 m from the study area, with 144 records within 5 km. This species occurs beneath logs, debris, and leaf litter in Cumberland Plain and Castlereagh Woodland habitats. While the proposed works will not directly disturb native vegetation, they occur immediately adjacent to potential habitat. Indirect impacts could include minor disturbance to the leaf litter and debris from machinery movement, vibrations from excavation, or temporary dust deposition, which may reduce habitat quality. A NSW Test of Significance (ToS) has been completed and is provided in Appendix 1.
<b>Caves and shelters</b>	No caves or significant overhangs which could provide roosting habitat for bats were found within the study area.	Not applicable.

Based on the size of the study area, the survey effort is considered comprehensive to assess habitat presence for the species outlined in above.

### 3.3.1 Priority weeds

Four priority weeds for the Greater Sydney region, which includes the Liverpool LGA, have been recorded in the study area, and are listed in Table 6, along with their associated Biosecurity Duty in accordance with the Biosecurity Act.

The Biosecurity Act provides for the identification, classification and control of priority weeds with the purpose of determining if a biosecurity risk is likely to occur. A priority weed is any weed identified in a local strategic plan, for a region that includes that land or area, as a weed that is or should be prevented, managed, controlled or eradicated in the region.

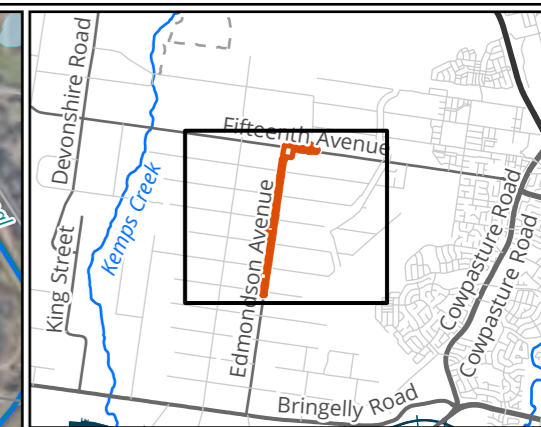
The General Biosecurity Duty as outlined in the Biosecurity Act states:

*All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*

**Table 6** Priority weeds within the study area

Scientific name	Common name	Relevant biosecurity duty
<i>Alternanthera philoxeroides</i>	Alligator Weed	General Biosecurity Duty
<i>Lycium ferocissimum</i>	African Boxthorn	General Biosecurity Duty
<i>Olea europaea subsp. cuspidata</i>	African Olive	General Biosecurity Duty
<i>Opuntia stricta</i>	Prickly Pear	General Biosecurity Duty

To prevent biosecurity impacts from occurring as a result of the presence of the above listed priority weeds within the study area, all practical steps should be taken to control and eradicate the weeds from the study area as per the relevant biosecurity duties outlined above, or prior to or during any future vegetation removal.



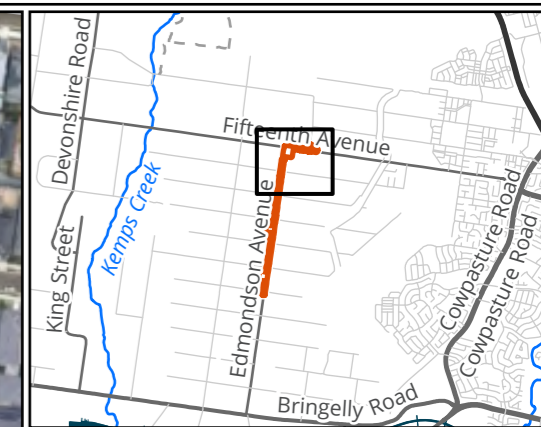
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- Study area
  - Area cleared under separate approval
  - Waterway (Biosis, 2025)
- Impact area**
- Shaft locations
  - GAB Shaft footprint
  - Laydown areas
  - Alignment
- Vegetation zone**
- 3320 - Cumberland Shale Plains Woodland (Moderate)
  - 3320 - Cumberland Shale Plains Woodland (Low)
  - 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
  - 4025 - Cumberland Red Gum Riverflat Forest (Low)
  - Exotic vegetation/grassed areas

**Figure 2.1 Ecological features of the study area**

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Meters  
Scale: 1:8,000 @ A3  
Coordinate System: GDA2020 MGA Zone 56



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- Legend**
- Study area
  - Area cleared under separate approval
- Impact area**
- Shaft locations
  - GAB Shaft footprint
  - Laydown areas
  - Alignment
- Vegetation zone**
- 3320 - Cumberland Shale Plains Woodland (Moderate)
  - 3320 - Cumberland Shale Plains Woodland (Low)
  - 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
  - Exotic vegetation/grassed areas

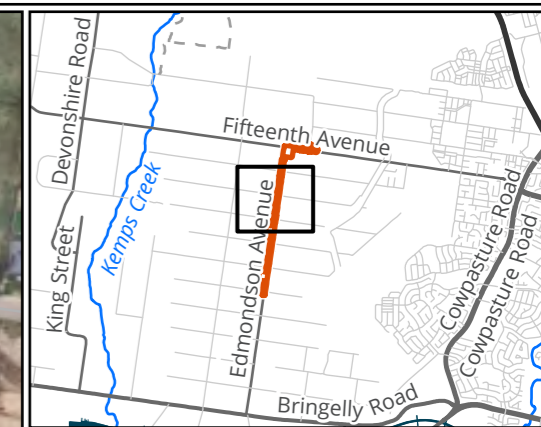
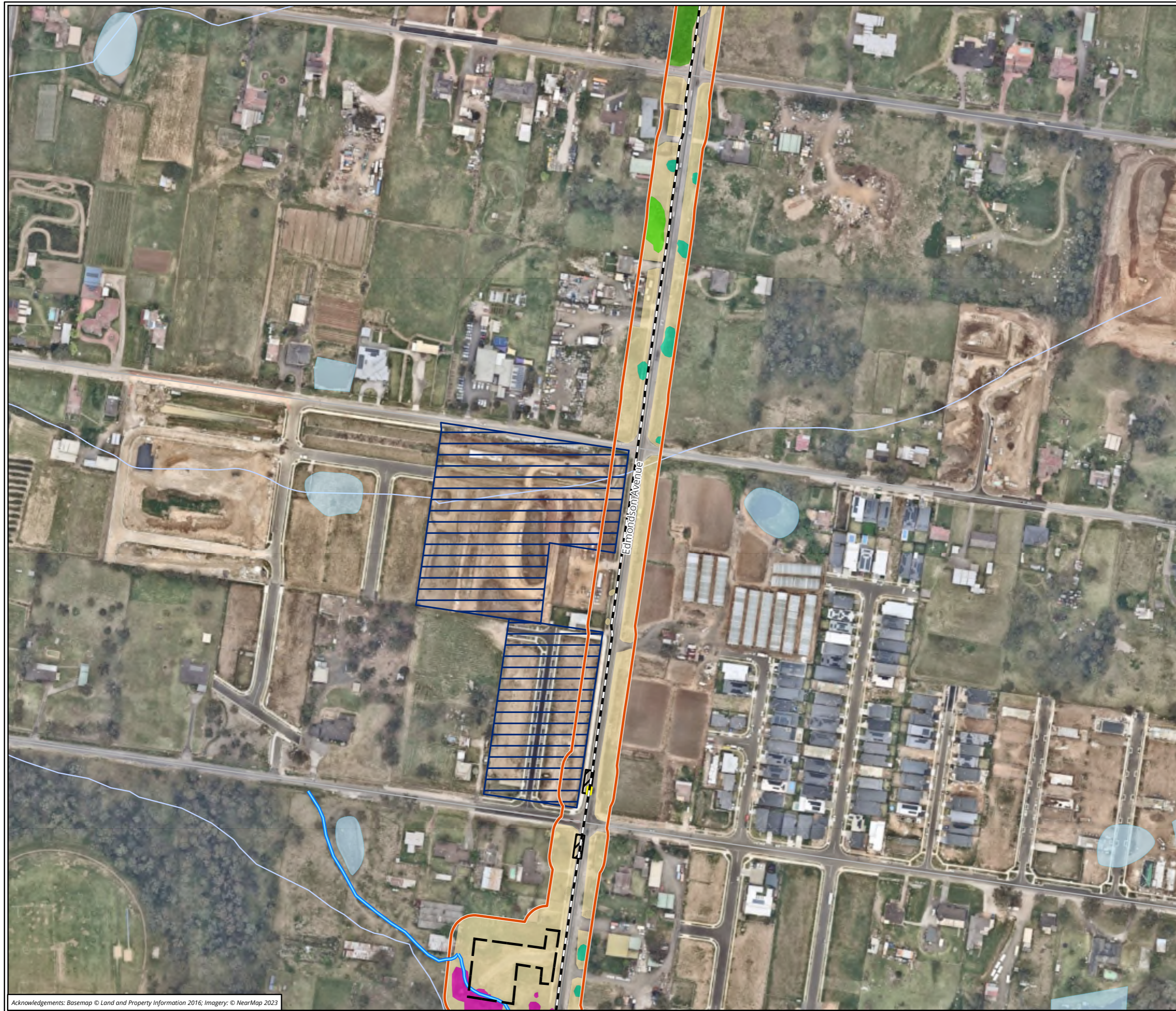
**Figure 2.2 Ecological features of the study area**

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Meters  
Scale: 1:3,000 @ A3  
Coordinate System: GDA2020 MGA Zone 56



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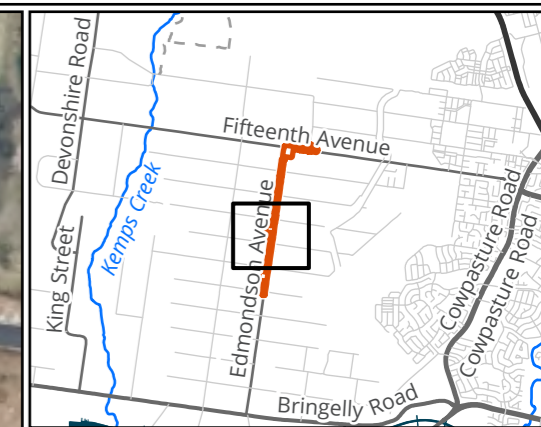
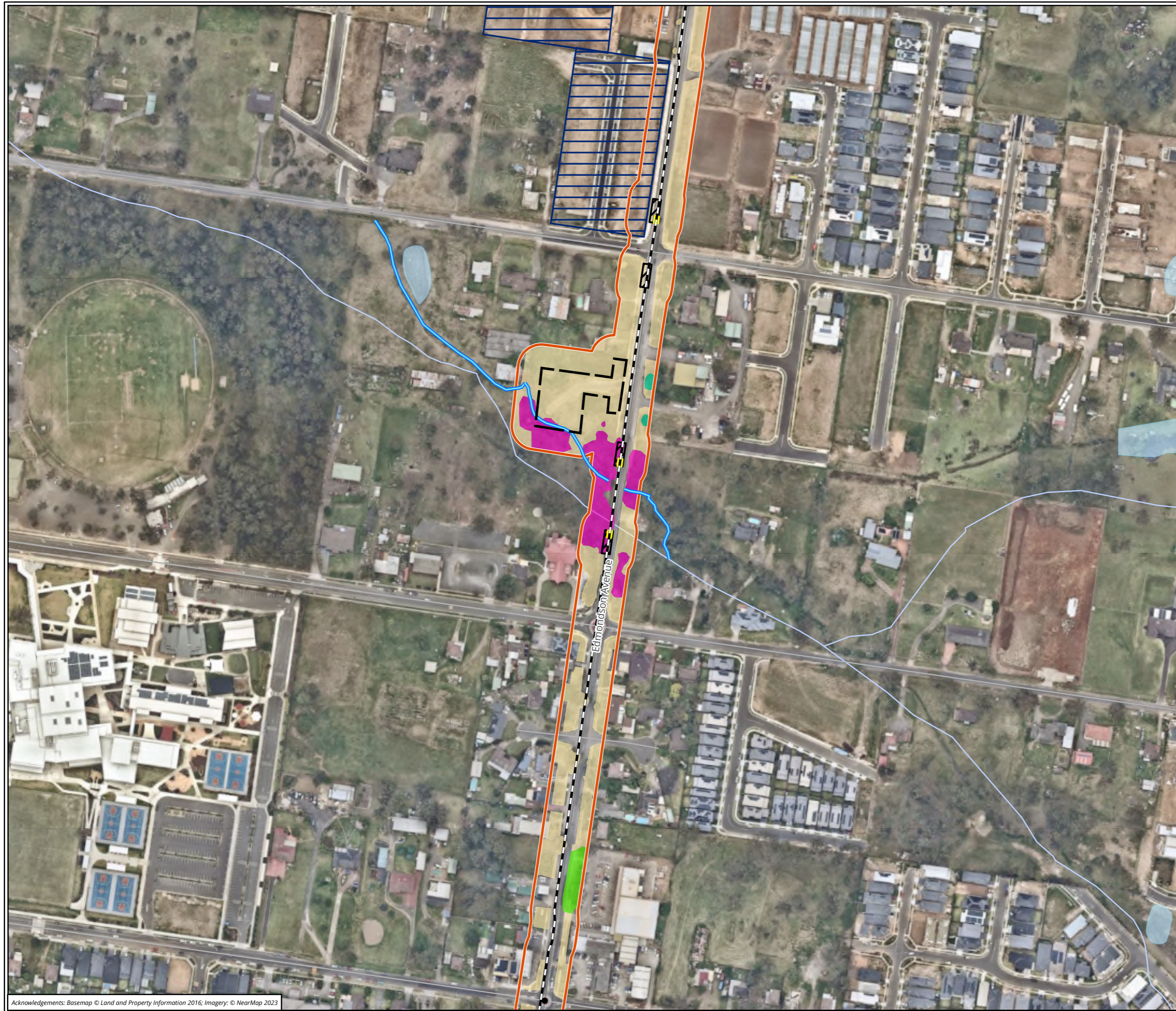
- Legend**
- Study area
  - Area cleared under separate approval
  - Waterway (Biosis, 2025)
- Impact area**
- Shaft locations
  - GAB Shaft footprint
  - Laydown areas
  - Alignment
- Vegetation zone**
- 3320 - Cumberland Shale Plains Woodland (Moderate)
  - 3320 - Cumberland Shale Plains Woodland (Low)
  - 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
  - 4025 - Cumberland Red Gum Riverflat Forest (Low)
  - Exotic vegetation/grassed areas

**Figure 2.3 Ecological features of the study area**

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Meters  
Scale: 1:3,000 @ A3  
Coordinate System: GDA2020 MGA Zone 56



Matter: 43045, Date: 02 February 2026,  
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Layout: 43045\_F2\_EcoFeatures  
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**Legend**

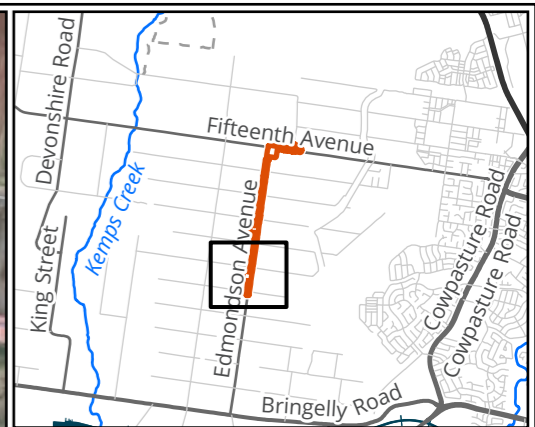
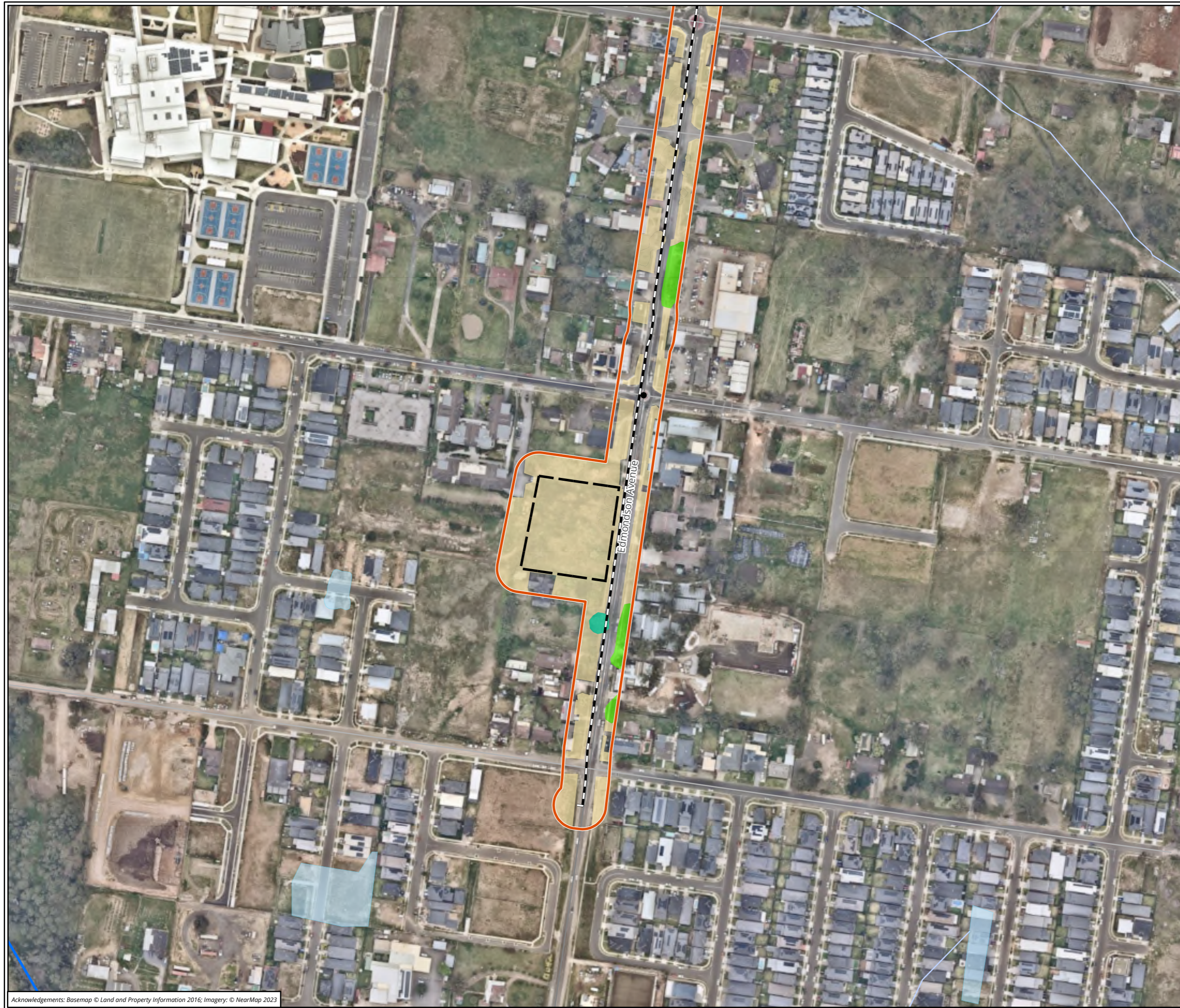
- Study area
- Area cleared under separate approval
- Waterway (Biosis, 2025)
- Impact area**
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- GAB Shaft footprint
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- Alignment
- Vegetation zone**
- 3320 - Cumberland Shale Plains Woodland (Low)
- 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
- 4025 - Cumberland Red Gum Riverflat Forest (Low)
- Exotic vegetation/grassed areas

**Figure 2.4 Ecological features of the study area**

0  100  
 Meters  
 Scale: 1:3,000 @ A3  
 Coordinate System: GDA2020 MGA Zone 56



Matter: 43045, Date: 02 February 2026,  
 Prepared for: JS, Prepared by: JB, Last edited by: jbeckius  
 Layout: 43045\_F2\_EcoFeatures  
 Project: P:\43000s\43045\Mapping\43045\_SWGA\_Liverpool\_FFA.aprx



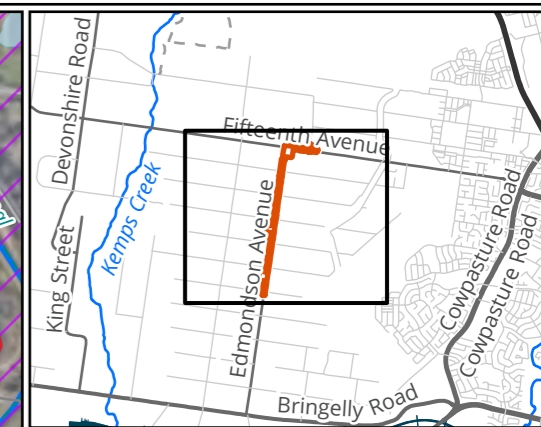
- Legend**
- Study area
  - Impact area**
  - Laydown areas
  - Alignment
  - Vegetation zone**
  - 3320 - Cumberland Shale Plains Woodland (Low)
  - 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
  - Exotic vegetation/grassed areas

**Figure 2.5 Ecological features of the study area**

0  100  
 Meters  
 Scale: 1:3,000 @ A3  
 Coordinate System: GDA2020 MGA Zone 56



Matter: 43045, Date: 02 February 2026,  
 Prepared for: JS, Prepared by: JB, Last edited by: jbeckius  
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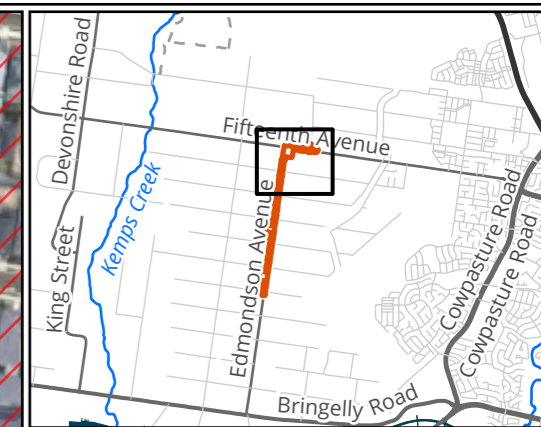
- Legend**
- Study area
  - Waterway (Biosis, 2025)
  - Cleared under separate approval
  - Existing Native Vegetation (ENV)
  - Ground-truthed ENV
- Impact area**
- Shaft locations
  - GAB Shaft footprint
  - Laydown areas
  - Alignment
- Growth Centre Land Certification**
- Existing Certified
  - Existing Non-Certified
- Vegetation zone**
- 3320 - Cumberland Shale Plains Woodland (Moderate)
  - 3320 - Cumberland Shale Plains Woodland (Low)
  - 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
  - 4025 - Cumberland Red Gum Riverflat Forest (Low)
  - Exotic vegetation/grassed areas

**Figure 3.1 Biodiversity certification**

0 100 200 300  
Meters  
Scale: 1:8,000 @ A3  
Coordinate System: GDA2020 MGA Zone 56



Matter: 43045, Date: 20 February 2026,  
Prepared for: JS, Prepared by: JB, Last edited by: jbeckius  
Layout: 43045\_F3\_BioCert  
Project: P:\43000s\43045\Mapping\43045\_SWGA\_Liverpool\_FFA.aprx



- Legend**
- Study area
  - Waterway (Biosis, 2025)
  - Cleared under separate approval
  - Existing Native Vegetation (ENV)
  - Ground-truthed ENV
- Impact area**
- Shaft locations
  - GAB Shaft footprint
  - Laydown areas
  - Alignment
- Growth Centre Land Certification**
- Existing Certified
  - Existing Non Certified
- Vegetation zone**
- 3320 - Cumberland Shale Plains Woodland (Moderate)
  - 3320 - Cumberland Shale Plains Woodland (Low)
  - 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
  - Exotic vegetation/grassed areas

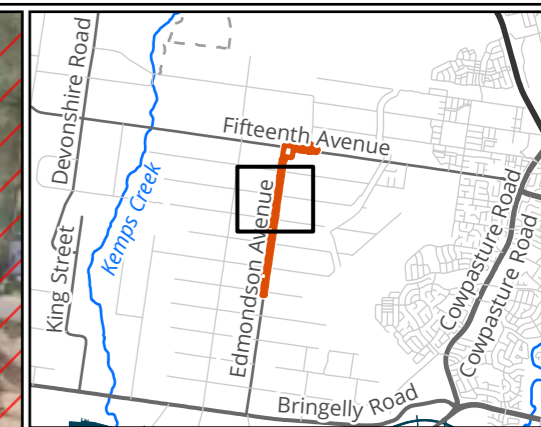
**Figure 3.2 Biodiversity certification**

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Meters  
Scale: 1:3,000 @ A3  
Coordinate System: GDA2020 MGA Zone 56



Matter: 43045, Date: 20 February 2026,  
Prepared for: JS, Prepared by: JB, Last edited by: jbeckius  
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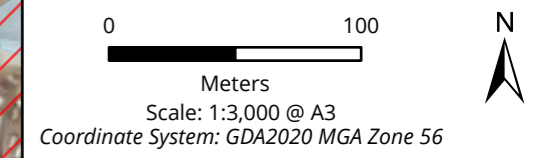
Acknowledgements: Basemap © Land and Property Information 2016; Imagery: © NearMap 2023



**Legend**

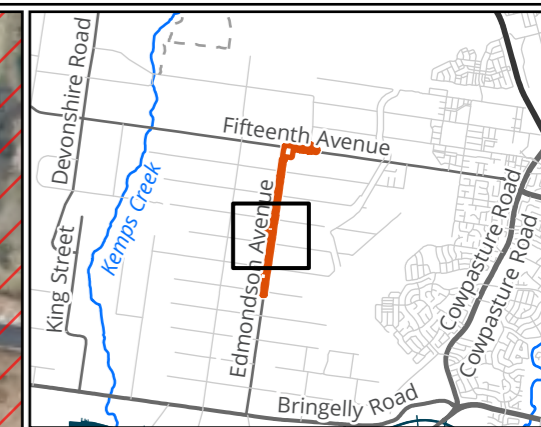
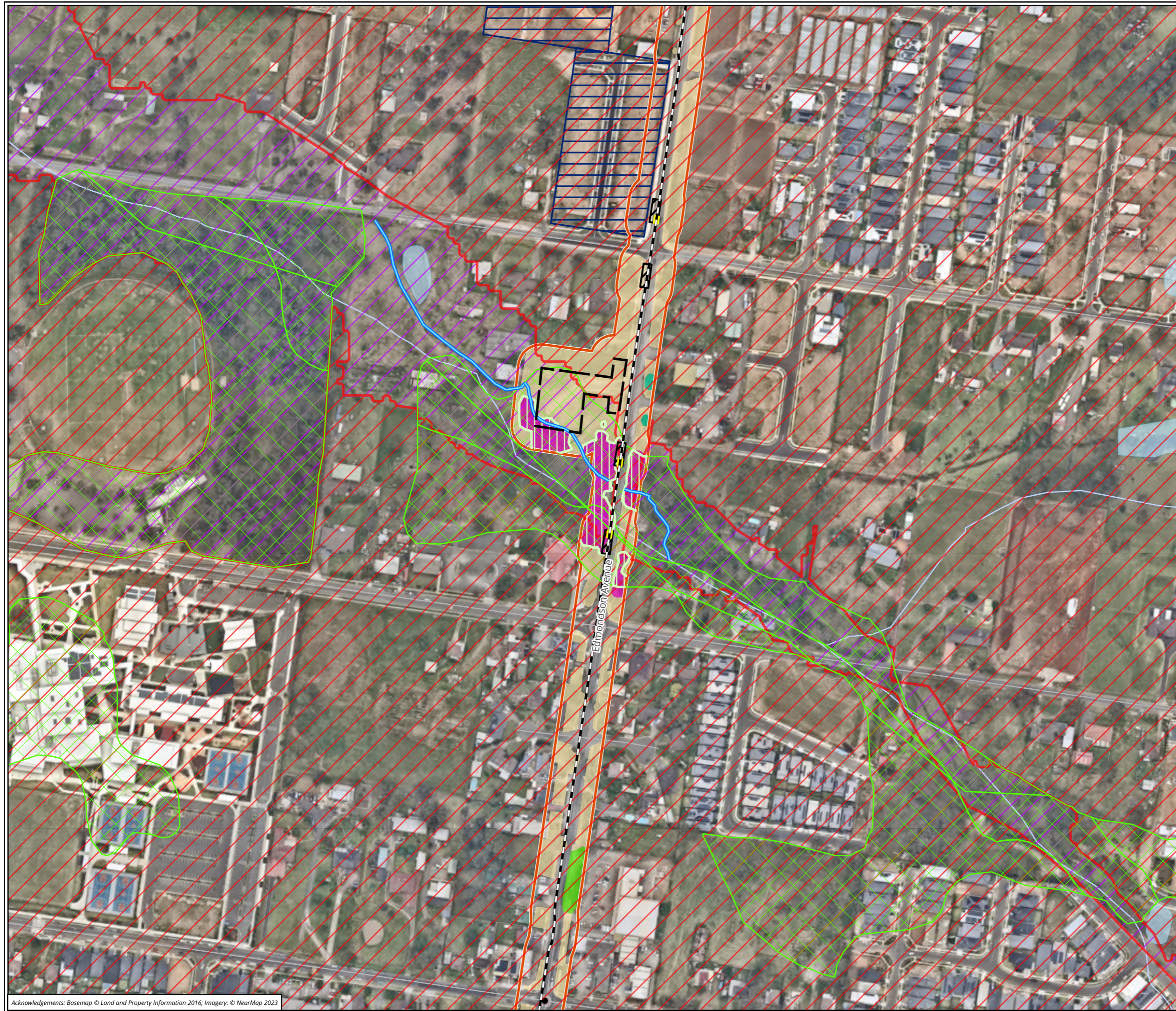
- Study area
- Waterway (Biosis, 2025)
- Cleared under separate approval
- Existing Native Vegetation (ENV)
- Ground-truthed ENV
- Impact area**
- Shaft locations
- GAB Shaft footprint
- Laydown areas
- Alignment
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- Existing Certified
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- 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
- 4025 - Cumberland Red Gum Riverflat Forest (Low)
- Exotic vegetation/grassed areas

**Figure 3.3 Biodiversity certification**



Matter: 43045, Date: 20 February 2026,  
 Prepared for: JS, Prepared by: JB, Last edited by: jbeckius  
 Layout: 43045\_F3\_BioCert  
 Project: P:\43000s\43045\Mapping\43045\_SWGA\_Liverpool\_FFA.aprx

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- Legend**
- Study area
  - Waterway (Biosis, 2025)
  - Cleared under separate approval
  - Existing Native Vegetation (ENV)
  - Ground-truthed ENV
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- Existing Certified
  - Existing Non Certified
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  - 4025 - Cumberland Red Gum Riverflat Forest (Low)
  - Exotic vegetation/grassed areas

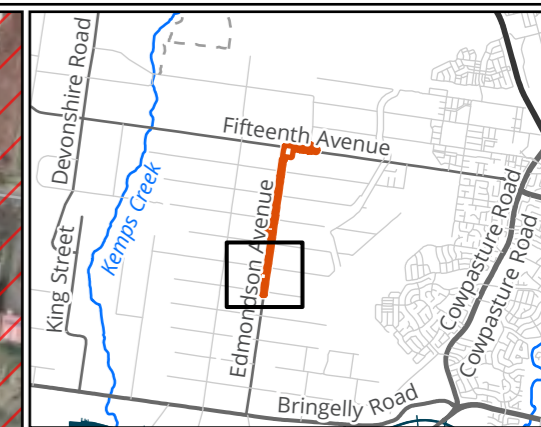
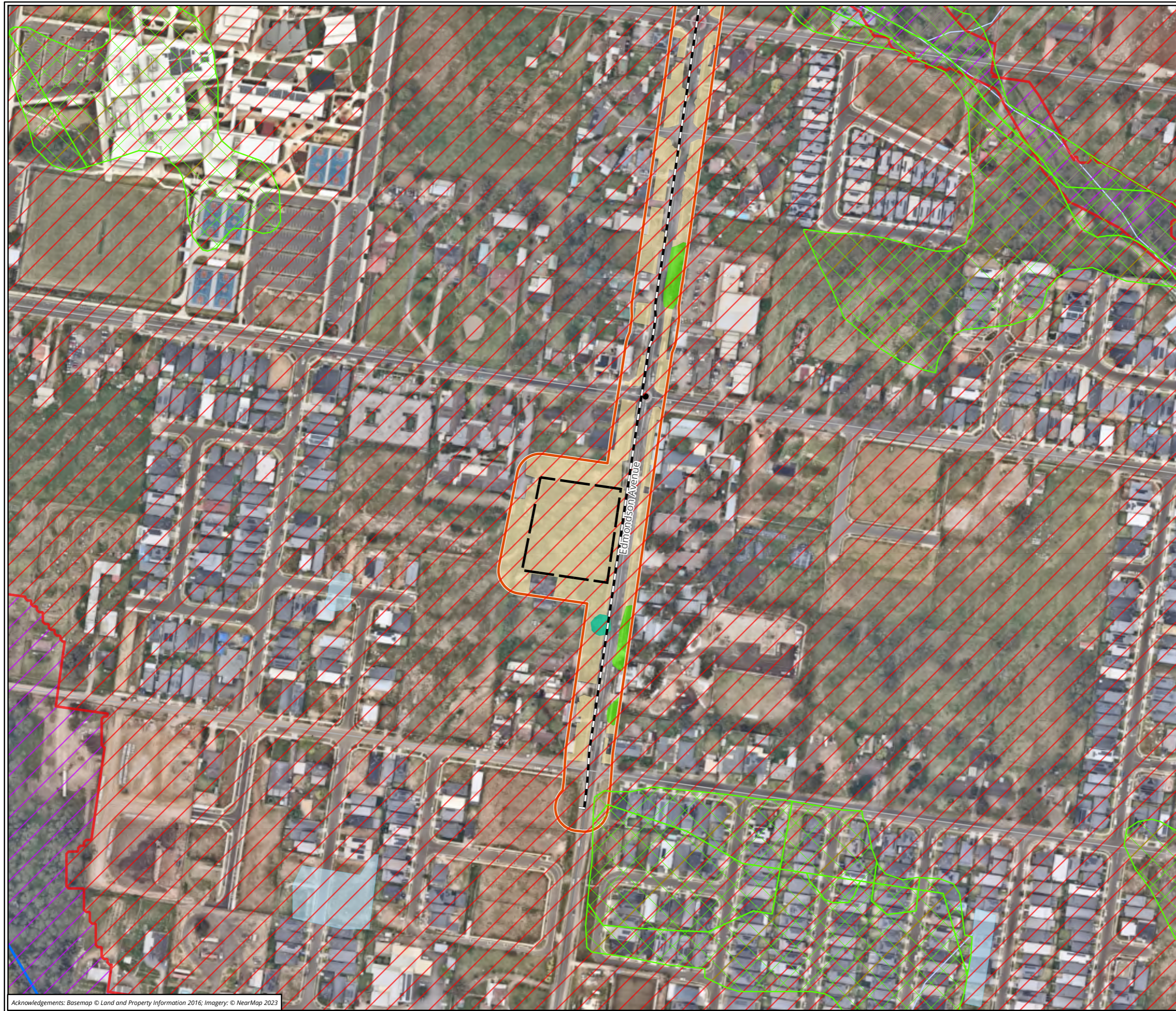
**Figure 3.4 Biodiversity certification**

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Meters  
Scale: 1:3,000 @ A3  
Coordinate System: GDA2020 MGA Zone 56



Matter: 43045, Date: 20 February 2026,  
Prepared for: JS, Prepared by: JB, Last edited by: jbeckius  
Layout: 43045\_F3\_BioCert  
Project: P:\43000s\43045\Mapping\43045\_SWGA\_Liverpool\_FFA.aprx

Acknowledgements: Basemap © Land and Property Information 2016; Imagery: © NearMap 2023



- Legend**
- Study area
  - Waterway (Biosis, 2025)
  - Cleared under separate approval
  - Existing Native Vegetation (ENV)
  - Ground-truthed ENV
- Impact area**
- Laydown areas
  - Alignment
- Growth Centre Land Certification**
- Existing Certified
  - Existing Non Certified
- Vegetation zone**
- 3320 - Cumberland Shale Plains Woodland (Low)
  - 3320 - Cumberland Shale Plains Woodland (Scattered Trees)
  - Exotic vegetation/graded areas

**Figure 3.5 Biodiversity certification**

0  100  
Meters  
Scale: 1:3,000 @ A3  
Coordinate System: GDA2020 MGA Zone 56



Matter: 43045, Date: 20 February 2026,  
Prepared for: JS, Prepared by: JB, Last edited by: jbeckius  
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Project: P:\43000s\43045\Mapping\43045\_SWGA\_Liverpool\_FFA.aprx

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## 4 Impacts and assessment against key legislation

This section identifies the potential impacts of the proposed works on the ecological values of the study area and provides recommendations to assist Sydney Water in designing the development to avoid, minimise, and mitigate potential impacts on ecological values where practicable.

The project alignment is entirely contained within existing road corridors, encompassing traffic lanes, road shoulders, verges, and footpaths. Construction activities will primarily involve open trenching for the installation of new infrastructure. However, trenchless techniques (e.g., horizontal directional drilling [HDD]) will be employed in all areas mapped as existing non-certified land. Considering the above, there is no anticipated direct impact toward ecological values. All impacts will be of an indirect nature only.

Indirect impacts may include temporary disturbance to fauna from noise, vibration, and human presence during construction, and potential edge effects on adjacent vegetation. Two threatened entities listed under the BC Act, the Cumberland Plain Land Snail and River-Flat Eucalypt Forest, were recorded, or have a medium or greater likelihood of occurring within the existing non-certified sections of the study area. These indirect impacts may include temporary disturbance of foraging, shelter, or movement habitat for fauna, as well as minor edge effects on vegetation such as accidental damage, dust deposition, or weed invasion, which may reduce habitat quality.

The ecological values present within non-certified land which may be impacted by the proposed works are described in Table 7 below, which includes recommendations to assist Sydney Water to design the development to avoid and minimise impacts on ecological values. Given that no direct impacts to biodiversity values within non-certified land are anticipated, offsetting under the Sydney Water Biodiversity Offset Policy is not required.

**Table 7 Impact summary**

Ecological value	Impacts	Recommendations
<b>Threatened ecological communities</b>	No direct impacts to any TECs within non-certified land are anticipated. Indirect impacts may consist of temporary edge effects, dust deposition, or weed invasion that could reduce habitat quality.	<ul style="list-style-type: none"> <li>Establish clear exclusion zones around TEC patches with temporary fencing or markers.</li> <li>Restrict machinery and personnel to defined construction areas.</li> <li>Implement dust suppression measures during construction.</li> </ul>
<b>Threatened flora/fauna habitat</b>	No direct impacts are anticipated. The proposed works may indirectly impact habitat for the Cumberland Plain Land Snail. Indirect impacts may consist of temporary disturbance from noise, vibration, and human presence, as well as minor edge effects on leaf litter, debris, or understorey vegetation.	<ul style="list-style-type: none"> <li>Maintain a clear construction footprint and avoid unnecessary encroachment into adjacent habitat.</li> <li>Protect leaf litter, logs, and debris where possible</li> </ul>

The below provides an assessment against relevant biodiversity legislation, policies, and planning instruments applicable to the project. It considers potential impacts to native vegetation, threatened flora and fauna, and ecological communities.

An assessment of the above impacts against key biodiversity legislation is provided below.

#### **4.1 Environment Protection and Biodiversity Conservation Act 1999**

The EPBC Act is the Australian Government's key piece of environmental legislation. The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National and Environmental Significance (MNES) protected under the Act. Under the EPBC Act, activities that have potential to result in significant impacts on MNES must be referred to the Commonwealth Minister for the Environment and Water for assessment.

Within the study area, one TEC listed under the EPBC Act, *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*, was recorded. However, this community occurs entirely within existing certified land and does not require formal assessment under the EPBC Act. As the proposed works will not impact areas of this ecological community outside certified land, no further consideration or referral under the EPBC Act is required.

#### **4.2 Biodiversity Conservation Act 2016**

The BC Act is the key piece of legislation providing for the protection and conservation of biodiversity in NSW through the listing of threatened species and communities and key threatening processes (KTPs). Impacts to threatened species and communities are assessed under Section 7.3 of the BC Act.

Two threatened entities (Cumberland Plain Land Snail and *River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*) listed under the BC Act have a medium or greater likelihood of occurring within parts of the study area that are not mapped as existing certified under the Biodiversity Certification Order for the SWGA. A NSW ToS assessment has been prepared for each of these threatened entities (Appendix 1) which concluded that a significant impact was not likely to result from the project, due to potential impacts being limited to indirect impacts. These potential indirect impacts will be mitigated by adhering to specific mitigation measures and recommendations.

#### **4.3 Water Management Act 2000**

The WM Act provides for the sustainable and integrated management of the state's water for the benefit of both present and future generations based on the concept of ecologically sustainable development. Under the WM Act an approval is required to undertake controlled activities on waterfront land, unless that activity is otherwise exempt under Section 91E or Part 2 of the Water Management Regulation 2018. Waterfront land is defined within the Act as the bed of any river, lake or estuary and any land within 40 metres of the riverbanks, lake shore or estuary mean high water mark.

As a public authority, Sydney Water does not need to obtain a controlled activity approval from the NSW DCCEE for any controlled activities that it carries out in, on or under waterfront land. While Sydney Water is exempt from the controlled activity approval process, the design considerations and management measures detailed in the relevant WM Act guidelines (Department of Climate Change, Energy, the Environment and Water 2025) should be considered.

## 4.4 Fisheries Management Act 1994

The FM Act provides for the protection and conservation of aquatic species and their habitat throughout NSW. Impacts to threatened species, populations and communities, and critical habitats listed under the FM Act must be assessed through an Assessment of Significance process.

No predicted Key Fish Habitat for threatened aquatic species is mapped on the DPI spatial data portal within the study area. No records of threatened aquatic species have been recorded within 5 kilometres of the study area on the BioNet Atlas of NSW.

The project will not impact the movement of water and is not expected to result in temporary or permanent blockages to fish passage and it not expected to impact upon habitat for threatened fish. Therefore further assessment in the form of an Assessment of Significance is not required. A permit in accordance with section 219 or 199 of the FM Act is also not required.

## 4.5 State Environmental Planning Policies

### 4.5.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure) SEPP) aims to facilitate the effective delivery of infrastructure across the State.

Chapter 2 of the SEPP contains planning rules and controls for infrastructure in NSW, such as for hospitals, roads, railways, emergency services, water supply and electricity delivery. This chapter is relevant to the current project assessment as utility infrastructure is considered as 'development permitted without consent'.

### 4.5.2 State Environmental Planning Policy (Biodiversity and Conservation) 2021

#### Chapter 3: Koala Habitat Protection 2020

This chapter applies to land zoned RU1, RU2 or RU3. As the project occurs on land zoned as SP2, this chapter does not apply. Clause 3.5(b) of Chapter 3 further clarifies that these obligations only apply to land in relation to which a development application has been made. As the activity is being carried out under Division 5.1 of the EP&A Act and is classified as development permitted without consent under the Transport and Infrastructure SEPP (i.e., no DA is required), the proposal does not require development consent, and Chapter 3 of the SEPP does not apply.

#### Chapter 4: Koala Habitat Protection 2021

Chapter 4 Koala Habitat Protection aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

However, Chapter 4 of the SEPP does not apply to this proposal, as the activity is being carried out under Division 5.1 of the EP&A Act and is classified as development permitted without consent under the Transport and Infrastructure SEPP. As the proposal does not require development consent, Chapter 4 of the SEPP does not apply.

### 4.5.3 State Environmental Planning Policy (Precincts – Western Parkland City) 2021

The Western Parkland City SEPP includes the provisions from the previous Sydney Region Growth Centres SEPP. The Western Parkland City SEPP establishes the broad framework for the development of four identified growth centres in Western Sydney; the North West Growth Centre, the South West Growth Centre, the Wilton Growth Area, and the Greater MacArthur Growth Area. The aim of this policy was to allow for the co-ordinated release of land for residential, employment and other urban development within the growth centres, in order to ensure high-quality, sustainable and liveable developments.

#### Order to confer biodiversity certification on the State Environmental Planning Policy (Sydney Regional Growth Centres) 2006

In December 2007, the Growth Centres Biodiversity Certification Order for North West Growth Centre and South West Growth Centre was made by the NSW Minister for the Environment. This biodiversity certification was granted under Schedule 7 of the now repealed NSW *Threatened Species Conservation Act 1995*. However, this certification still has effect until 30 June 2026 due to the action of Part 8 Clause 43 of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*. The original certification was due to expire on 30 June 2025, however, following a public notification and consultation process, the Minister for the Environment signed an Order on 6 June 2025 extending the biodiversity certification for one year, until 30 June 2026. This extension was given effect by publication in the NSW Government Gazette on 20 June 2025.

The study area is predominantly mapped as 'Existing Certified' land, with only a small portion of the mapped as Existing Non-Certified land. The effects of the conferred biodiversity certification are:

*(1) Any development for which development consent is required under the provisions of a biodiversity certified EPI is, for the purposes of the Part 4 of the EP&A Act, taken to be development that is not likely to significantly affect any threatened species, population or ecological community, or its habitat.*

The Biodiversity Certification Order also outlines 41 conditions, known as Relevant Biodiversity Measures (RBMs) to ensure consistency with the biodiversity certification for the growth centres during future development. RBMs relevant to this assessment include:

- RBM 5 - *Pursuant to section 126H of the Act, the biodiversity certification of the SEPP is limited to the certified areas.*
  - Activities proposed to be undertaken within the certified areas do not need to undertake assessment of impacts on threatened entities that would normally be required by the EP&A Act.
- RBM 13 - *If new information becomes available after the biodiversity certification order took effect that demonstrates that the vegetation within an area does not otherwise meet the definition of existing native vegetation, then for the purposes of conditions 7 to 8 and condition 11 to 12 only the area of confirmed existing native vegetation shall be considered*
  - ENV was incorporated into the Western Parkland City SEPP to ensure for the protection of at least 2,000 ha within the Growth Centres. Field investigations confirmed that ENV is present within the study area. However, it was determined that the extent of ENV differed from what was originally present at the time that the biodiversity certification order took effect. This difference was predominantly due to some patches of vegetation having a canopy that was less than 10%, or areas existing as structures/roads. The extent of the field validated ENV is displayed on Figure 3.
  - No areas of field validated will be impacted by the proposed works.

No further controls listed within the RBMs are considered relevant to the current assessment, and no further consideration is required.

## 4.6 Local Environmental Plans/Development Control Plans

### Liverpool LEP/Liverpool DCP

LEPs are legal documents that guide planning decisions and controls land use within a specific local government area in Australia. DCPs are planning and design guidelines to support the planning controls of the LEP for each LGA.

However, Chapter 2, Division 22, Subdivision 1 (2.159) of the Transport and Infrastructure SEPP specifies that development for the purpose of water supply activities carried out by a public authority is considered development permitted without consent. Given that Sydney Water is a public authority, the SEPP overrides the zoning under the LEP, and the development is permissible without consent.

## 5 Conclusion and recommendations

This report is an assessment of the potential impact of the proposed works on ecological values within the study area in accordance with the EP&A Act, EPBC Act, BC Act, FM Act, WM Act and Biosecurity Act.

The study area includes a mix of certified land and non-certified land. Under the Biodiversity Certification Order for the SWGA, areas mapped as certified do not require formal assessment under the BC Act or EPBC Act. Significance assessments were completed to consider potential indirect impacts to the Cumberland Plain Land Snail and River Flat-Eucalypt Forest EEC. These assessments concluded that a significant impact is not likely to result from the project. This conclusion was made on the basis that:

- There will be no direct impacts to vegetation and habitat areas within non-certified areas as a result of the proposed works.
- Potential indirect impacts will be minimised by following the below safeguards and project specific recommendations.
- Large, intact vegetation areas will remain undisturbed, maintaining ecological function and connectivity.

This project will not result in a significant impact on threatened species, populations or communities listed under the BC Act, and therefore the BOS is not triggered, and a BDAR is not required.

Sydney Water’s standard safeguards, provided in Table 8 below, are designed to comprehensively address potential environmental impacts throughout the project. Developed through extensive experience, these safeguards cover key areas such as vegetation management, fauna protection, erosion control, and waste handling. They ensure compliance with regulations while promoting best practice environmental management. Their flexibility allows for site-specific adaptation, providing confidence that impacts will be effectively minimised and managed. Site-specific recommendations are also provided in Table 9.

**Table 8 Sydney Water standard safeguards**

Safeguard category	Safeguard information	Location
<b>Topography, geology and soils</b>		
2.1	Appropriate erosion and sediment control measures should be installed at all sites to avoid sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values including: <ul style="list-style-type: none"> <li>• Divert surface runoff away from disturbed soil and stockpiles.</li> <li>• Install sediment and erosion controls before construction starts.</li> <li>• Reuse topsoil where possible and stockpile separately.</li> <li>• Inspect controls at least weekly and immediately after rainfall.</li> <li>• Rectify damaged controls immediately.</li> <li>• Remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines.</li> </ul>	All locations
2.2	Minimise ground disturbance and stabilise disturbed areas progressively.	All locations
2.6	Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.	All locations

Safeguard category	Safeguard information	Location
2.7	Sweep up any sediment/soil transferred off site at least daily, or before rainfall.	All locations
2.7	Eliminate ponding and erosion by restoring natural landforms to the pre-works condition.	All locations
<b>Water and drainage</b>		
3.1	Use appropriate controls to avoid potential sedimentation to waterbodies (e.g. floatation boom).	All locations
3.3	Minimise the impacts to creeks where creek crossings are required. Prior to construction the methodology will be assessed based on: <ul style="list-style-type: none"> <li>• Geotechnical and constructability issues (e.g. depth of cover, potential for future scouring).</li> <li>• Construction footprint and duration.</li> <li>• Ease of reinstatement.</li> <li>• Environmental issues (flora and fauna, geomorphology, contamination, heritage, water quality and hydrology).</li> <li>• Any issues raised during consultation with Department of Primary Industries.</li> </ul>	All locations
3.6	Bund potential contaminants and store on robust waterproof membrane, away from drainage lines.	All locations
3.8	Locate portable site amenities away from watercourses or drainage lines.	All locations
3.16	Conduct refuelling, fuel decanting and vehicle maintenance in compounds where possible. If field refuelling is necessary, designate an area away from waterways and drainage lines with functioning spill kits close by.	All locations
<b>Flora and fauna</b>		
4.5	Minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Where possible, limit clearing to trimming rather than the removal of whole plants.	All locations
4.6	Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.	All locations
4.7	Adjust methodology (e.g. avoid area, hand excavate, implement exclusion fencing) to protect sensitive areas where possible (such as mature trees, known threatened species, populations or ecological communities).	All locations
4.8	Protect trees in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary, and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone	All locations
4.11	Retain dead tree trunks, bush rock or logs in-situ unless they are in the impact area and moving is unavoidable. Reposition material elsewhere on the site or approved adjacent sites. If native fauna is likely to be present, a licenced ecologist should inspect the removal and undertake fauna relocation.	All locations
4.13	If native fauna is encountered on site, stop work and allow the fauna to move away	All locations

Safeguard category	Safeguard information	Location
	un-harassed. Engage a licenced ecologist if assistance is required to move fauna	
4.14	Avoid impeding/blocking fish passage. Retain snags and natural obstructions in waterways where possible.	All locations
4.17	Stop work immediately and notify the Sydney Water Project Manager if any threatened species (flora or fauna) is discovered during the works. Work will only recommence once the impact on the species has been assessed and appropriate control measures provided.	All locations
4.19	Manage biosecurity in accordance with: <i>Biosecurity Act 2015</i> (see NSW Weedwise), including reporting new weed infestations or invasive pests. Contemporary bush regeneration practices, including disposal of sealed bagged weeds to a licenced waste disposal facility.	All locations
4.21	To prevent spread of weeds: Clean all equipment including PPE prior to entering or leaving the work sites. Wrap straw bales in geo-fabric to prevent seed spread.	All locations
4.27	Minimise impacts on native vegetation in non-certified areas, native vegetation retention areas and areas outside the growth centre. Options to consider where feasible include: Alternative construction methodologies (under bore vegetation and waterways, compressed construction corridors). avoiding impact to hollow bearing and habitat trees.	All locations
4.28	Vegetation removal required must not occur until the following are complete: The area to be removed has been physically delineated. The Contractor's Environmental Representative has confirmed consistency with approval documentation. Pre-clearing surveys, if relevant. Written authorisation to commence clearing from Sydney Water Project Manager.	All locations

**Table 9 Project specific safeguards**

Safeguard information	Location
All stockpile and compound areas are to be located within existing cleared areas and existing access tracks, and will be rehabilitated at the end of construction.	All locations
All staff on site are to be educated on the ID characteristics of the threatened species identified as having a moderate likelihood of occurrence (see section 3.3) and advised to not handle fauna species under any circumstances during toolbox talks.	All locations
No-go fencing installed for retained vegetation to ensure surrounding area remains undisturbed.	All locations

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## Appendix 1 Tests of Significance

### ***River-flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions***

River-flat Eucalypt Forest is listed as an EEC under the BC Act. The community is found on the river flats of the coastal floodplains. It has a tall open tree layer of eucalypts, which may exceed 40 metres in height, but can be considerably shorter in regrowth stands or under conditions of lower site quality. The most widespread and abundant dominant trees within this community that occur within the Cumberland subregion include Forest Red Gum, Cabbage Gum, Rough-barked Apple *Angophora floribunda* and Broad-leaved Apple *A. subvelutina*.

Major examples once occurred on the floodplains of the Hunter, Hawkesbury, Moruya, Bega and Towamba Rivers, although many smaller floodplains and river flats also contain examples of the community. The remaining area is likely to represent much less than 30% of its original range. Given its habitat, the community has an important role in maintaining river ecosystems and riverbank stability. Associated with silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains.

#### **River-flat Eucalypt Forest within the study area**

PCT 4025 within the study area meets the listed criteria for the BC Act listed *River-flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*.

For this assessment, the local occurrence of River-flat Eucalypt Forest comprises all PCT 4025 mapped within the study area which also extends outside the study area along the unnamed waterway associated with Kemps Creek. Additionally, the local occurrence also comprises any patches that occur within the vicinity. While this project will not result in the removal of vegetation from this community, indirect impacts may still occur, therefore an assessment of these potential indirect impacts has been provided below in accordance with the test of significance detailed in Section 7.3 of the BC Act.

**Table A.1 Test of Significance for River-flat Eucalypt Forest**

Test of Significance for River-flat Eucalypt Forest
<p><b>In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.</b></p>
<p>Not applicable, not a threatened species.</p>
<p><b>In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</b></p> <ul style="list-style-type: none"> <li><b>(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</b></li> <li><b>(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.</b></li> </ul>
<p>The local occurrence of River-flat Eucalypt Forest is considered to comprise all areas of PCT 4025 mapped within the study area, the riparian corridor of the unnamed waterway associated with Kemps Creek, as well as any contiguous patches</p>

## Test of Significance for River-flat Eucalypt Forest

that occur within the vicinity.

While areas of this community may not be directly impacted, it may be subject to indirect impacts as a result of sediment run-off and weed exposure. Appropriate sediment and weed control protocols will be implemented during the construction of the project. Within the study area, River-flat Eucalypt Forest occurs in a fragmented and highly modified landscape and has therefore been recorded in a low condition. Native canopy species are present, however structural and floristic diversity is limited, and the understorey is dominated by introduced species. With appropriate sediment and weed control, the proposed works are unlikely to reduce species diversity or simplify community structure beyond what is already occurring. The vegetation will be protected in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites (Council of Australian Standards 2009) to ensure no direct impacts occur.

### **In relation to the habitat of a threatened species or ecological community:**

- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and**
- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and**
- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.**

The proposed works will not result in a direct impacts to the community. Areas of the EEC exists in low condition with little to no ground cover and are already subject to edge effects resulting from the fragmented and urban landscape within which it occurs. The nature of indirect impacts (sedimentation and weed ingress) will not substantially reduce the habitat available to the EEC in the locality, nor will it result in further isolation or fragmentation of habitats due to the proposed mitigation measures that will ensure adequate control of these indirect impacts during the proposed words. The importance of the habitat indirectly impacted is also considered negligible due to existing disturbance, little structural and species diversity, and its occurrence on the edge of a patch of vegetation. As such, this level of impact is considered negligible and will not lead to the local occurrence of River-flat Eucalypt Forest being placed at risk of extinction.

### ***Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (AOBVs) (either directly or indirectly).***

To date no AOBVs have been declared within the project's impact area.

### ***Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.***

The proposed development may result in indirect impacts, such as soil compaction, sedimentation, edge effects, or the potential for invasion of native plant communities by exotic species, which is a Key Threatening Process (KTP) listed under Schedule 4 of the BC Act. While these indirect impacts could influence habitat condition, they are not expected to result in a significant impact on the KTP, provided that recommended mitigation and management measures are implemented. Therefore, with appropriate controls in place, the proposed works are unlikely to exacerbate the impacts of any KTP relevant to River-flat Eucalypt Forest.

### **Conclusion.**

### Test of Significance for River-flat Eucalypt Forest

The proposed works are unlikely to significantly affect River-flat Eucalypt Forest for the following reasons:

- The proposed works will not result in the direct removal of any River-flat Eucalypt Forest.
- The proposed works is unlikely to significantly alter floristic or structural diversity of the EEC.
- The localised nature of the proposed works will not significantly trigger or exacerbate any key threatening processes.
- Mitigation measures will be put in place to ensure indirect impacts (sedimentation and weed ingress) are appropriately managed during the proposed works such that the occurrence of this community within non-certified areas is not indirectly impacted.

Application of the BOS or preparation of a Species Impact Statement (SIS) is therefore not required.

### Cumberland Plain Land Snail *Meridolum corneovirens*

The Cumberland Plain Land Snail is listed as Endangered under the BC Act. It lives in small areas on the Cumberland Plain west of Sydney, from Richmond and Windsor south to Picton and from Liverpool west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. This species primarily inhabits Cumberland Plain Woodland, a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities. It lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps often near waterways. Occasionally shelters under rubbish.

The closest BioNet record is approximately 600 metres from the study area, with 144 records within 5 kilometres. While the proposed works will not directly disturb native vegetation, they occur immediately adjacent to potential habitat. Indirect impacts could include minor disturbance to the leaf litter and debris from machinery movement, vibrations from excavation, or temporary dust deposition, which may reduce habitat quality. An assessment of whether the proposal is likely to lead to a significant impact Cumberland Plain Land Snail is provided below in accordance with the test of significance detailed in Section 7.3 of the BC Act.

**Table A.2 Test of Significance for Cumberland Plain Land Snail**

#### Test of Significance for Cumberland Plain Land Snail

**In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction**

The proposed works, under the current design, will not result in the direct removal of vegetation within non-certified areas. However, there is potential for indirect impacts to potential habitat for the Cumberland Plain Land Snail as a result of the proposed activities. The Cumberland Plain Land Snail is typically associated with areas containing leaf litter, logs, and coarse woody debris within moist sheltered habitats. These microhabitat features provide essential resources for foraging, shelter, and reproduction.

While construction activities occur immediately adjacent to non-certified habitat, indirect impacts are expected to be minimal. Potential effects include temporary disturbance from noise, vibration, and human presence, as well as minor edge effects such as accidental displacement or compaction of leaf litter and debris. The scale and duration of these activities are unlikely to compromise the availability or quality of key microhabitats across the non-certified areas. Given these considerations, the proposed works are not expected to have an adverse effect on the life cycle of the Cumberland Plain Land Snail, and are unlikely to place a viable local population of the species at risk of extinction. Mitigation measures, including maintaining a defined construction footprint, minimising disturbance to leaf litter and coarse woody debris, and implementing sediment, erosion, and weed control measures, will further reduce any potential

**Test of Significance for Cumberland Plain Land Snail**

indirect impacts.

**In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:**  
 (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or  
 (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable – not an ecological community.

**In relation to the habitat of a threatened species or ecological community:**  
 (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and  
 (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and  
 (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

The proposed works will not result in the direct removal or clearing of vegetation within non-certified land. Indirect modification of habitat may occur immediately adjacent to the construction footprint, primarily through minor disturbance of leaf litter, logs, and coarse woody debris. These impacts are expected to be localised and temporary, with the majority of suitable habitat remaining intact.

The project alignment is entirely contained within existing road corridors, and works are largely linear and confined. As a result, there is negligible risk of fragmenting or isolating habitat for the Cumberland Plain Land Snail. Connectivity of adjacent habitat patches within the wider landscape is expected to remain intact.

The small areas of habitat potentially affected by indirect impacts represent a minor portion of the available habitat in the locality. Given the minimal extent and temporary nature of the impacts, as well as the persistence of key microhabitat features in surrounding areas, these works are not expected to compromise the long-term survival of the Cumberland Plain Land Snail within the study area.

**Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)**

The proposed works will not impact on an area declared as of outstanding biodiversity value (either directly or indirectly).

**Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process**

The proposed works do not constitute, nor are they part of, any Key Threatening Process (KTP) listed under the Schedule 4 of the BC Act.

**Conclusion**

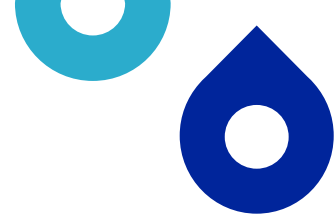
In consideration of the above, the proposed activity is not likely to significantly impact the Cumberland Plain Land Snail within the study area or wider locality, as:

- No direct impacts to Cumberland Plain Land Snail will occur within non-certified areas.
- Potential indirect impacts are limited to minor, indirect effects associated with construction activities, which will be effectively mitigated through the implementation of recommended measures.
- The localised nature of the proposed works will not significantly trigger or exacerbate any key threatening processes.

### Test of Significance for Cumberland Plain Land Snail

Therefore, no further assessment is required and a SIS or BDAR is not required.





# Appendix D – Aboriginal Heritage Due Diligence

6 February 2026

Stuart Dawson  
Senior Environmental Scientist  
Environment & Heritage | Water and Environment Services  
Stuart.dawson@sydneywater.com.au

Dear Stuart,

**RE: Aboriginal archaeological due diligence assessment for proposed water infrastructure works for Package 2, Liverpool, Sydney, NSW**

### **1.0 Introduction**

AECOM Australia Pty Ltd (AECOM) was commissioned by Sydney Water Corporation (Sydney Water) to undertake an Aboriginal archaeological due diligence assessment to support proposed water infrastructure works located in the western Sydney suburb of Austral, New South Wales (NSW) (the 'Project area'; Figure 1).

The purpose of this assessment is to identify potential impacts to Aboriginal heritage values from the proposed works and to provide Sydney Water with appropriate management advice. The contents of this letter report have been compiled with reference to Heritage NSW's *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (the Code of Practice) (DECCW, 2010). This code has been developed to assist proponents in exercising due diligence when carrying out activities that may harm Aboriginal objects.

### **2.0 Proposed Activity**

AECOM understands that Sydney Water is proposing to construct and operate new infrastructure to service the Liverpool area. The proposed works will include the installation of a 2.3 km long DN500 trunk main along Edmondson Avenue and Fifteenth Avenue. Key ground surface disturbances from the works will include:

- Targeted vegetation removal, including tree removal, within the Project area (as required)
- Excavation/trenching along the proposed pipeline corridor, comprising a 1 m wide trench
- Excavation of new maintenance holes along the proposed pipeline corridor
- Establishment of a temporary compound and laydown areas.

It is noted that the proposed pipeline corridor lies wholly within existing disturbed road corridors, with only the temporary compounds and laydown areas located outside these areas.

### **3.0 Assumptions and Limitations**

Information on previously recorded Aboriginal sites within and surrounding the Project area was obtained by AECOM through a search of the Aboriginal Heritage Information Management System (AHIMS) database and the NSW State Heritage Inventory (SHI), as well as a desktop review of relevant previous Aboriginal heritage investigations. It is noted that coordinate errors are a common feature of the AHIMS database, along with duplicate site entries, incorrect site statuses and types, and omissions or errors in site content. Given these issues, all Aboriginal site data sourced from the AHIMS database for this assessment was cross-checked and validated against the information provided in original assessment reports and lodged site cards (where available).

Predictions regarding the likelihood of subsurface archaeological deposits within the Project area have been made in this report based on existing environmental and archaeological datasets, along with field observations. However, it should be noted that such deposits can occur in any environmental context.

### **4.0 Relevant Legislation & Policy**

#### **4.1.1 National Parks and Wildlife Act 1974**

The *National Parks and Wildlife Act 1974* (NPW Act), administered by Heritage NSW, is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The NPW Act gives the Secretary of the Department of Planning, Housing and Infrastructure (DPHI) responsibility for the proper care,

preservation and protection of 'Aboriginal objects' and 'Aboriginal places', defined under the Act as follows:

- an *Aboriginal object* is any deposit, object or material evidence (that is not a handicraft made for sale) relating to the Aboriginal habitation of NSW, before or during the occupation of that area by persons of non-Aboriginal extraction (and includes Aboriginal remains)
- an *Aboriginal place* is a place declared so by the Minister administering the NPW Act because the place is or was of special significance to Aboriginal culture. It may or may not contain Aboriginal objects.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and places by making it an offence to harm them and includes a 'strict liability offence' for such harm. A 'strict liability offence' does not require someone to know that it is an Aboriginal object or place they are causing harm to in order to be prosecuted. Defences against the 'strict liability offence' in the NPW Act include the carrying out of certain 'Low Impact Activities', prescribed in Clause 58 of the *National Parks and Wildlife Amendment Regulation 2019* (NPW Regulation), and the demonstration of due diligence.

An Aboriginal Heritage Impact Permit (AHIP) issued under Section 90 of the NPW Act is required if impacts to Aboriginal objects and/or places cannot be avoided. An AHIP is a defence to a prosecution for harming Aboriginal objects and places if the harm was authorised by the AHIP and the conditions of that AHIP were not contravened. Applications for an AHIP must be accompanied by assessment reports compiled in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010b). Applications must also provide evidence of consultation with Aboriginal communities. Consultation is required under Part 8A of the NPW Regulation and is to be conducted in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a). AHIPs may be issued in relation to a specified Aboriginal object, Aboriginal place, land, activity or person or specified types or classes of Aboriginal objects, Aboriginal places, land, activities or persons.

Section 89A of the NPW Act requires notification of the location of Aboriginal sites within a reasonable time, with penalties for non-notification. Section 89A is binding in all instances.

**Figure 1 Project area**



## 5.0 Data Sources

Information regarding the known and potential Aboriginal heritage values of the Project area was obtained from:

- A review of the landscape context of the Project area and surrounds
- Searches of the AHIMS database and NSW State Heritage Inventory (SHI)
- A review of the findings of past Aboriginal heritage investigations within and surrounding the Project area
- A visual inspection of the Project area by AECOM Principal Heritage Specialist Geordie Oakes on 28 October 2025.

## 6.0 Landscape Context

Consideration of the landscape context of the Project Area is based on the principle that the nature and distribution of Aboriginal archaeological materials are closely linked to environmental conditions. Factors such as topography, geology, hydrology, and local resources influenced patterns of movement and land use, including the availability of campsites, water, food resources, and raw materials. An understanding of historical and contemporary land use, together with geomorphic processes such as erosion and aggradation, is also critical to assessing the formation, integrity, and subsurface potential of archaeological deposits.

Key observations from a review of the landscape context of the Project area are presented in Table 1.

**Table 1 Review of landscape context of the Project area**

Environmental Variable	Key Observations
Topography	The topography of the Project area prior to impacts associated with general urban development was typical of the Cumberland Lowlands physiographic region, as defined by Bannerman and Hazelton (2011), and can be broadly described as gently undulating. The area now comprises a largely modified landscape shaped by the construction of roads and residential properties.
Hydrology	<p>The Project area is located within the Kemps Creek sub-catchment. Two watercourses intersect the Project area, comprising a first-order and a second-order tributary of Kemps Creek. The first-order watercourse consists of a highly ephemeral drainage line located near Thirteenth Avenue, while the second-order watercourse comprises a more incised, semi-permanent channel located near Eleventh Avenue.</p> <p>Existing archaeological survey data for the Cumberland Plain indicate a strong trend for the presence of open artefact sites along watercourses, specifically, on creek banks and 'flats' (i.e., flood/drainage plains), terraces and bordering lower slopes (Kohen, 1986). Although this distribution pattern can be attributed in part to geomorphic dynamics and archaeological sampling bias, with extensive fluvial erosion activity along watercourses resulting in higher levels of surface visibility and, by extension, concentrated survey effort, an occupational emphasis on watercourses is supported by the results of numerous subsurface investigations (e.g., AECOM, 2013b, 2015; AMBS, 2000; Craib et al. 1999; GML, 2012; Jo McDonald CHM, 2001, 2003, 2005a, 2006a, 2006b, 2007, 2009a, 2009b). Collectively, these investigations have demonstrated that assemblage size and complexity tend to vary significantly in relation to stream order and landform, with larger, more complex assemblages concentrated on elevated, low gradient landform elements adjacent to higher order watercourses (≥3rd order). Outside of these contexts, surface and subsurface artefact distributions have typically been found to be sparse and discontinuous and are often referred to as 'background scatter'.</p>

Environmental Variable	Key Observations
Geology	Reference to the Penrith 1:100,000 Geological Mapsheet (9030) indicates that the surface geology within the Project area consists of Bringelly Shale - the uppermost unit of the Wianamatta Group - comprising variously shale, claystone, coal, tuff and sandstone. Deposited in a swampy alluvial plain, the Bringelly Shale (Rwb) has been described as a “complex formation of different lithologies” (Bembrick et al., 1991: 17).
Soils	Soils within the Project area have been mapped by Bannerman and Hazelton (1990) as belonging to the Blacktown soil landscape. These have been characterised as hard setting mottled texture contrast soils, with red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and in drainage lines. Dominant ‘A’ horizon soils comprise friable and hard setting loams with pH levels ranging from neutral (pH 7.0) to moderately acidic (pH 5.0).
Flora & Fauna	Extant vegetation in the Project area has been historically cleared, with current vegetation consisting of a mix of native and exotic grasses. Prior to European settlement, the vegetation of the Project area is likely to have been derived from Shale Plains Woodland (Tozer, 2003).
Land Disturbance	Historical aerial photographs and field observations indicate that land within the road corridor portion of the Project area has been highly disturbed. The proposed compound and laydown areas are less disturbed, having been historically cleared and subject to localised disturbances.

**7.0 Aboriginal Heritage**

**7.1 AHIMS Sites**

The AHIMS database, administered by Heritage NSW, contains records of all Aboriginal objects reported to the Director General of the Department of Premier and Cabinet in accordance with Section 89A of the NPW Act. It also contains information about Aboriginal places, which have been declared by the Minister to have special significance with respect to Aboriginal culture. Previously recorded Aboriginal objects and declared Aboriginal places are known as ‘Aboriginal sites’.

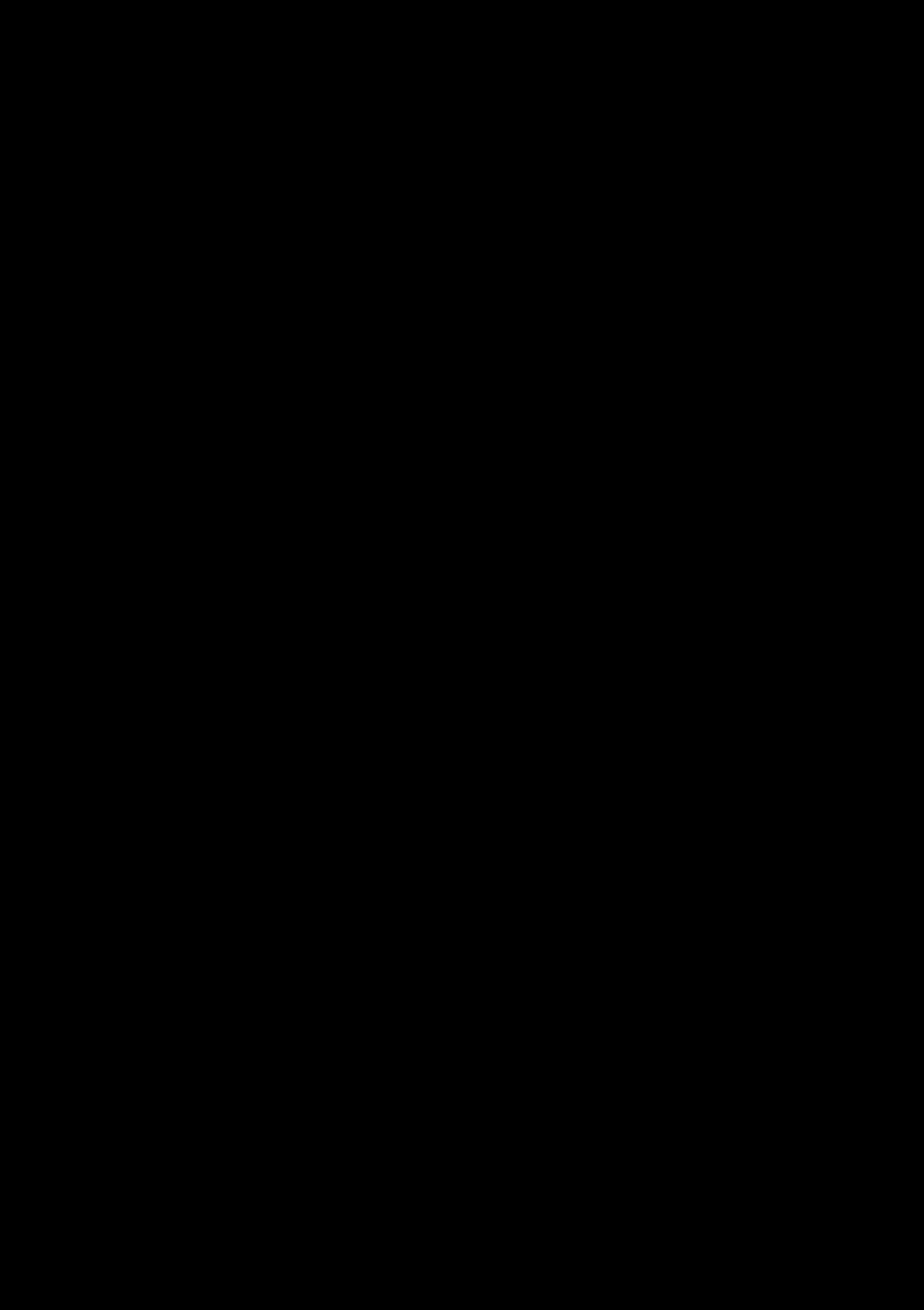
A search of the AHIMS database was undertaken on 26 September 2025 for a 20 x 20 km area centred on the Project area. A total of 1,417 Aboriginal archaeological sites were identified within the search area, comprising 1,164 open artefact sites, 149 Potential Archaeological Deposit (PAD) areas, 38 modified trees, 38 open artefact sites with associated PAD, and smaller numbers of other site types, including scarred trees (2), axe grinding grooves (6), rock shelters with art (5), art sites (4), and ceremonial, quarry, hearth, and resource gathering sites (Figure 2).

**Table 2 AHIMS search results**

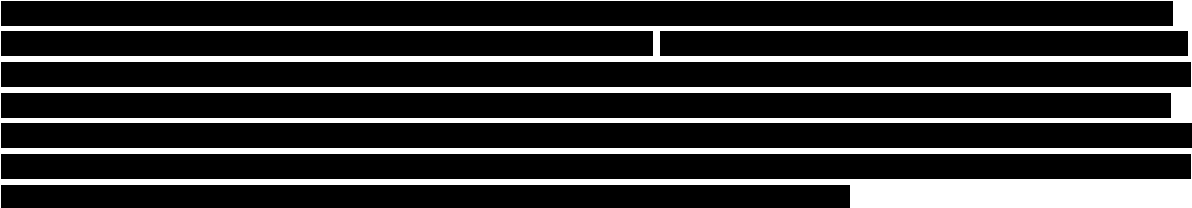
Site Type	Count	%
Art	4	0.3
Axe Grinding Grooves	6	0.4
Ceremony and Dreaming	1	0.1
Hearth	1	0.1
Hearth; PAD	1	0.1
Modified Tree	38	2.7
Modified Tree; PAD	1	0.1



Figure 2 AHIMS sites and AHIPs



**7.3 Aboriginal Heritage Impact Permits**



**Figure 3 View of AHIP #4938 area with aerial dated to 30/03/2023**

## 8.0 Previous Aboriginal Heritage Investigations

The Aboriginal archaeology of the Austral area is well researched, having been the subject of numerous Aboriginal archaeological investigations incorporating survey and/or excavation over the past 20 years. Notable investigations to date have included surveys by Australian Museum Business Services (2011), Heritage Concepts (2008), and Kelleher Nightingale Consulting (2010), as well as test excavation programs by (AECOM Australia Pty Ltd, 2016; Apex Archaeology, 2024; GML Heritage Pty Ltd, 2012; Kelleher Nightingale Consulting Pty Ltd, 2016). Key observations drawn from a review of the local and regional archaeological context of the Project area are as follows:

- Available radiometric dates indicate that Aboriginal people have occupied the Sydney region for at least 36,000 years. Compared with the limited evidence available for the Late Pleistocene and early Holocene, evidence for mid- to late Holocene Aboriginal occupation of the Sydney region is abundant, with the majority of previously recorded sites and deposits likely dating to these periods.
- Existing archaeological data for the Sydney region indicate that assemblage size and complexity vary significantly in relation to stream order and landform, with larger, more complex assemblages concentrated on elevated, low-gradient landform elements adjacent to higher-order watercourses. Outside of these contexts, surface and subsurface artefact distributions are typically sparse and discontinuous and are often referred to as 'background scatter'.
- Most surface sites occur on landform elements within 200 m of watercourses, with larger, more complex artefact assemblages associated with higher-order streams.
- Existing AHIMS data for the Austral area suggest that artefact scatters and isolated artefacts are the predominant site types in the area.
- Local stone artefact assemblages attest to an emphasis on the procurement and reduction of silcrete. Other, less commonly exploited raw materials include silicified tuff, fine-grained siliceous (FGS) stone, quartz, quartzite, petrified wood and volcanic stone.
- Flake and non-flake debitage items dominate recorded site assemblages.
- Inter-site variation in the composition of stone artefact assemblages across the greater Austral area can be attributed to factors such as the frequency, intensity, and duration of settlement events; distance to lithic raw material sources; and differing reduction strategies (e.g., specialised versus non-specialised manufacture).

- [REDACTED]

## 9.0 Visual Inspection

A visual inspection of the Project area was completed on 28 October 2025 by Geordie Oakes (AECOM Principal Heritage Specialist). The purpose of the inspection was to assess whether the proposed works will, or are likely to, harm any Aboriginal objects or sites. During the inspection, notes were taken on Ground Surface Visibility (GSV), Ground Integrity (GI, i.e., land condition), archaeological sensitivity, and impact risk. Impact risk was determined based on archaeological sensitivity, as well as the nature of proposed Project-related impacts. The results of the inspection included the following:

- No new Aboriginal objects, sites, or places were identified within the Project area during the inspection.
- [REDACTED]
- [REDACTED]

- Ground surface visibility (GSV) across the Project area was variable, with areas of high visibility associated with clearing, disturbance, access tracks, and erosion, and low visibility in other areas due to vegetation (grass) cover (Figures 4-6).
- Despite widespread surface disturbance, isolated pockets of relatively intact soil were observed in limited areas. However, these were not assessed as having archaeological sensitivity.
- Consistent with the examined aerial imagery, the visual inspection confirmed that land within the overwhelming majority of the Project area has been variously disturbed by historic land uses, resulting in generally low ground integrity (GI).

• [REDACTED]



**Figure 4** View southwest of laydown area near AHIMS site 45-5-5546 (Source: AECOM 2025)



**Figure 5** View north along Edmonson Avenue from Eleventh Avenue (Source: AECOM 2025)



**Figure 6** View north of laydown area near Tenth Avenue (Source: AECOM 2025)



**Figure 7** View southwest of laydown area near Ninth Avenue (Source: AECOM 2025)

**10.0 Key Findings**

The key findings of this Aboriginal archaeological due diligence assessment are as follows:

- No new Aboriginal objects/sites were identified during the site inspection.
- [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Table 3 provides a summary of the key questions asked as part of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010:10). Should the answer to Question 4 be 'yes', further investigation and impact assessment is required.

**Table 3 Due diligence questionnaire**

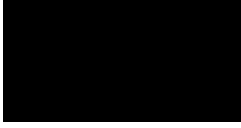
<b>No.</b>	<b>Due Diligence Question</b>	<b>Response</b>
1	<i>Will the activity disturb the ground surface (or culturally modified trees)?</i>	Yes
2a	<i>Are there any relevant confirmed site records or other associated landscape feature information on AHIMS?</i>	Yes
2b	<i>Are there any other sources of information of which a person is already aware?</i>	No
2c	<i>Are there any landscape features that are likely to indicate presence of Aboriginal objects?</i>	Yes
3	<i>Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?</i>	Yes
<b>4</b>	<b><i>Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?</i></b>	<b>Yes</b>

**11.0 Recommendations**

On the basis of the above findings, the following recommendations are made:

1. Use of the compound and laydown area [REDACTED] may occur subject to the following conditions:
  - Use is restricted to the area previously used by Sydney Water in 2022, and no new previously undisturbed areas are impacted
  - No additional subsurface disturbance is to occur beyond what was previously undertaken
  - Consideration should be given to the use of geofabric or similar material to protect underlying soils
  - Use of the area is generally consistent with Sydney Water's previous use of the site.
2. Subject to adherence to Recommendation 1, no further Aboriginal heritage assessment works are considered warranted for the proposed activity.
3. All Sydney Water personnel and contractors should be made aware, through a toolbox heritage induction, of the nature and location of all Aboriginal sites and of their responsibility to avoid harm to them.
4. In the event that Aboriginal objects/sites, including possible human skeletal material (remains), are identified during the proposed activity all works in the area must cease immediately and the relevant provision of Sydney Water's Environmental Management System (SWEMS009) should be followed. The stop work procedure should be included within the Project's construction management plan.

Kind regards



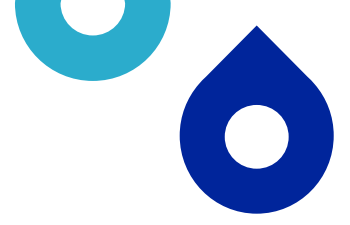
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