



# **Brian Road Intersection Upgrade Geotechnical Works**

Minor Works Review of  
Environmental Factors

Tharawal and Gandangara Country

Transport for NSW | September 2022

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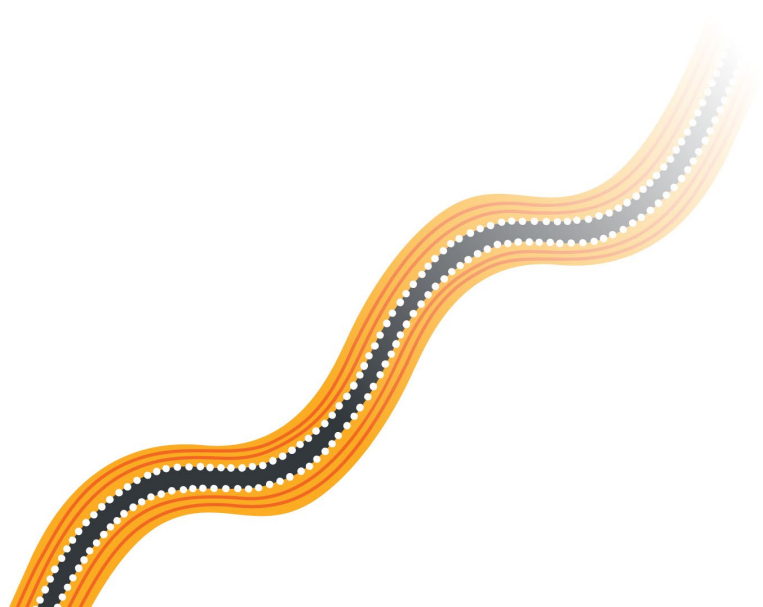
# Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which the Brian Road Intersection Upgrade – Geotechnical Investigations is proposed.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.



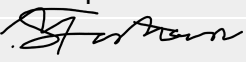
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Minor Works Review of Environmental Factors  
Transport for NSW | September 2022

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# Document controls

## Approval and authorisation

Title	Brian Road Intersection Upgrades Geotechnical Works Minor Works Review of Environmental Factors
Accepted on behalf of Transport for NSW by:	Yogaratnam Suthan Project/Contract Manager Infrastructure and Place Transport For NSW
Signed:	
Dated:	2022.09.14

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# 1. Introduction

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The purpose of the Minor Works Review of Environmental Factors (REF) is to describe the proposal, to document the likely impacts of the proposal on the environment, to detail mitigation measures to be implemented and to determine whether or not the proposal can proceed. For the purposes of this work Transport for NSW (Transport) is the proponent and determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The description of the proposed works and assessment of associated environmental impacts has been undertaken in the context of section 171 of the Environmental Planning and Assessment Regulation 2021, *Guidelines for Division 5.1 Assessments* (DPE, 2022), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act) and the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so the REF helps to fulfil the requirements of section 5.5 of the EP&A Act including that Transport examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The potential for the proposal to significantly impact a matter of national environmental significance, including nationally listed threatened biodiversity matters, or the environment of Commonwealth land. Where a significant impact is considered likely on nationally listed biodiversity matters, either the proposal must be reconsidered or a Project REF must be prepared.



## 2. The proposal

### 2.1 Description

#### 2.1.1 Proposal location

Location details	
Title	Brian Road Intersection Upgrade Geotechnical Works Minor Works Review of Environmental Factors
File number	
Road name and number	Appin Road (Main Road 177)
Closest cross road(s):	Brian Road and Appin Road
Chainage of works:	-250 to 1050 and 4000 to 4550
Local government area:	Campbelltown and Wollondilly Shire Council
Transport for NSW region:	Sydney and Southern

#### 2.1.2 Description of proposed work

Transport for NSW proposes to carry out geotechnical and utility investigations along Appin Road for the proposed Brian Road roundabout and fauna underpasses along Appin Road to support the detailed design for the Brian Road Intersection Upgrade between Appin and Gilead. The proposal is shown in Figure 2.1. Key features of the proposal include the following:

##### ***Buried services search***

A Dial Before You Dig (DBYD) buried utilities search will be carried out for the proposal and a certified service locator will be engaged to check services for each investigation location using a combination of conventional scanning equipment and ground penetrating radar (GPR), if required.

##### ***Traffic management***

Work would be within the road corridor, there may be a requirement for additional signage if working within a private access road. Management of traffic may be necessary within the road reserve, dependent on final location of boreholes. If a Traffic Control Plan is required, implementation will be carried out in accordance with TfNSW Traffic Control at Worksites Manual Version 5.0; RMS 18.898.

##### ***Access***

Drive-on, drive-off access would be required for all investigation locations and positioned within the current Appin Road reserve/ verge area or within private property. Access to each borehole location along the route will be marked on the investigation location plans (refer Appendix A within Appendix B).

- BH01 – Borehole location will be communicated to the property owners by TfNSW prior to site works, and the site investigation manager to advise the property owner at the start of site investigation that works are being carried out on their property.

- BH02 – Proposed borehole location and access routes will be communicated to the property owner by TfNSW prior to site works to agree an access strategy and gain approval. Should specific access requirements stipulated by property owners clash with REF obligations, the investigation location will be put on hold until advice is provided by TfNSW. Access will be agreed for the duration of the work for all site personnel, and during site work the site investigation manager will liaise with the property owners.

### ***Geotechnical investigation***

Two boreholes drilled to a depth of 6 m at the approximate location of the underpass entry portals to the east and west of the road corridor.

- It is noted that the proposed locations are positioned approximately 50m apart (in private land) which is wider than the 30m limit stipulated as the maximum distance between boreholes for culvert investigations in Table PS331.1 of QA Specification PS331. The reason for this departure from PS331 is:
  - The presence of drainage gullies and or slopes immediately adjacent to the hard shoulders, as well as potential buried services within the road reserve to the west prevent locations being moved closer together without drilling within the road.
  - Borehole drilling within the road corridor would require closure of at least one lane of traffic, necessitating further Traffic Control Plans (TCP), Road Occupancy Licenses (ROL), council approval, and (likely) restricted daytime working hours.
  - Review of geological maps, existing site investigation data, and aerial imagery to identify changes in vegetation or ground surface indicates a relatively uniform ground profile in this area.
- Geotechnical laboratory testing - The following testing for structure foundations and pavements, conformable to QA Specification PS331 is proposed to provide information on existing and modified soil and rock materials:
  - Moisture content.
  - Particle size distribution, including hydrometer.
  - Atterberg Limits.
  - Soil and groundwater aggressivity (durability) testing
  - Point Load Index Tests – to be performed on rock cores.
  - Installation of a standpipe piezometer to monitor for shallow, perched groundwater. Standpipe installation may also be required to satisfy environmental requirements, if the presence of Groundwater Dependent Ecosystems (GDEs) is identified.
- No Acid Sulfate Soil or rock testing is proposed due to the low likelihood of occurrence indicated by the National Acid Sulfate Soils Atlas and CSIRO ASRIS website (<http://www.asris.csiro.au>).

### ***Utility investigation***

In conjunction with the 2 geotechnical investigations, it is proposed to undertake utility investigations, which will include up to 11 potholes and/or 6 slit trenches within the proposed works area to help inform the 100% detailed design. The exact combination of potholes or slit trenches will be dependent on constraints encountered. The works will also include numerous non-destructive traces with GPR (class b traces). The works will include locations along the proposed works study area for both Telstra fibre optics or copper cable and Sydney Water potable water. All vehicles are expected to remain within the carriageway and only pedestrian access on the verge. The proposed 11 pothole investigations are outlined as:

- Sydney Water potable water PE125 – eastern side of Appin Road at CH -65
- Telstra fibre optic – eastern side of Appin Road at CH60
- Telstra fibre optic – eastern side of Appin Road at CH85
- Telstra copper cable and potable water house connection – eastern side of Appin Road at CH90
- Telstra fibre optic – eastern side of Appin Road at CH650

- Telstra fibre optic – eastern side of Appin Road at CH690
- Telstra fibre optic – eastern side of Appin Road at CH790
- Telstra fibre optic – eastern side of Appin Road at CH860
- Telstra fibre optic – eastern side of Appin Road at CH950
- Telstra fibre optic – eastern side of Appin Road at Ch4260
- Telstra fibre optic – eastern side of Appin Road at Ch4280.

The slit trenches would be located in the following locations:

- Telstra fibre optic – eastern side of Appin Road at CH 175
- Telstra fibre optic – eastern side of Appin Road at CH 275
- Telstra fibre optic – eastern side of Appin Road at CH 375
- Telstra fibre optic – eastern side of Appin Road at CH 475
- Telstra fibre optic – eastern side of Appin Road at CH 575
- Telstra fibre optic – eastern side of Appin Road at CH 900.

The combination of potholes and slit trenches is included in the methodology to safeguard against constraints such as access approvals, limitation in equipment and topography limitations to safely park the vacuum truck. Six slit trenches (all approximately 6-7m by 0.3m) would be used to confirm the Telstra Fibre Optic is not located in the verge area and will only be implemented if the limitations on site do not enable the potholing strategy to proceed. Additionally, only certain locations may be implemented in lieu of the nearest pothole. Consequently, as it is not possible to determine exactly if the potholes, slit trenches or a combination of both will be utilised, we have assumed the worst case which all 11 potholes and all 6 slit trenches are required to provide the necessary information to finalise the detailed design.

The proposal is anticipated to involve the following work methodology:

- Establish traffic control where necessary to enable access to the location for the duration of trenching at each location. The traffic control will be moved as necessary and not set up to block the entire length of road
- Potholes will be excavated using pressurised water and sediment recovery vacuum truck and restricted to the surveyed areas only. Once service is located and recorded, the holes will be filled in with recovered cuttings and compacted to the surface level.
- No pavement areas are planned to be drilled.

### ***Plant and equipment***

The proposal would require various items of plant and equipment including:

- Utility/site vehicle
- Pressurised water and sediment recovery vacuum truck
- Drill rig
- Traffic control vehicles, cones, and signage.

### ***Working hours***

Works are expected to occur outside peak hours and within restricted Road Occupancy Licence (ROL) hours.

### **2.1.3 Objectives of works**

The objectives of the proposal are to:

- Improve road safety for all road users
- Inform the design development and refinement process for Appin Road (the project)
- Minimise environmental impacts.

## 2.1.4 Ancillary facilities

Ancillary facilities		
<i>Will the proposal require the use or installation of a compound site?</i> No compound site facilities would be required for the works. Equipment and plant would be brought to site each day from a nearby contractor or Roads and Maritime depot.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Will the proposal require the use or installation of a stockpile site?</i> A stockpile site is not required for the proposal.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Are any other ancillary facilities required (e.g. temporary plants, parking areas, access tracks)?</i> No other ancillary facilities are required for the proposal.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

## 2.1.5 Proposed date of commencement

Subject to approval, the proposed works would commence in September 2022.

## 2.1.6 Estimated length of construction period

Weather permitting, the indicative period of works would be about two weeks from commencement.

## 2.2 Need and options

This MWREF is needed to inform the design for the Brian Road Intersection Upgrade, which aims to improve the safety of Appin Road and cater for future land release in the area. This MWREF will assess the potential impacts of the utility and geotechnical investigations on the surrounding environment, which are required to inform the final design for the Brian Road Intersection Upgrade Project.

### 2.2.1 Geotechnical investigations

The objective of the proposed works is to provide additional data to enable preparation of representative geological and geotechnical models for Detailed Design of the Brian Road Intersection Upgrade.

The minimum geotechnical investigation requirements for detailed design are outlined in the specification RMS PS331. The proposed geotechnical investigations will infill data that was not collected at the Strategic Design site investigation stage. The proposed geotechnical investigation was agreed with TfNSW to satisfy these specification details for detailed design.

### 2.2.2 Utility site investigations

The objective of the proposed works is to accurately locate existing utilities for the Brian Road Intersection Upgrade works.

### 2.2.3 Options considered

The options considered for the proposal included:

#### ***Option 1: Do nothing***

Advantages:

- This option would have no impact on the surrounding environment, including no potential sediment or water quality impacts, no impacts to biodiversity, no impacts to soil, and no visual and noise disturbance, access impacts or traffic disruption.

Disadvantages:

- Safety benefits associated with this investigation (improving safety in design) would not be realised
- The utilities investigation undertaken by TfNSW in 2018, 2019 and 2020 would be used for detailed design. As the previous investigation was unsuccessful at locating the Sydney to Melbourne optic fibre, the detailed design at these areas would be based on broad assumptions and interpolations of DBYD and utilities investigation data. This methodology would not satisfy TfNSW specifications

#### ***Option 2: Preferred option***

The preferred option is to undertake geotechnical and utility investigations adjacent to Appin Road.

Advantages:

- This option would inform important design refinement for safety improvements
- This option would provide information required for the detailed design of Brian Road roundabout and fauna underpass
- Safeguards can be implemented to minimise environmental impacts

Disadvantages:

- Potential for minor and short-term impacts to the surrounding environment, including sediment or water quality impacts, biodiversity, soil disturbance, visual and noise disturbance, and access and traffic disruption

### 2.2.4 Justification for the proposal

The Appin Road Safety Review (Transport for NSW, 2014) identified that between 2007 and 2011 there were five fatal crashes, 76 injury crashes and 69 non-casualty (tow away) crashes on Appin Road.

In the five year period between 2012 and 2016 there were 27 recorded crashes at Appin Road from Brian Road to Mount Gilead. These included one fatal, 14 injury crashes and 12 non casualty crashes. These were predominantly run-off-road crashes with rear end, striking an animal, and head-on also accounting for crashes in the area. Safety improvements to Appin Road was recommended to address these safety issues.

Geotechnical and/or intrusive works and an additional fauna underpass at Brian Road were not considered in the description of the approved project REF (Advisian and Roads and Maritime Services 2019) and therefore, these proposed geotechnical investigations and fauna underpass currently do not have planning approval.

While the proposal would involve some impacts, primarily noise and traffic, these have been identified as relatively minor and short term (limited to the construction phase).

## 2.3 Statutory and planning framework

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

The State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP (Transport and Infrastructure)) aims to facilitate the effective delivery of infrastructure across the state, including for roads and road infrastructure facilities. Section 2.108 of the SEPP (Transport and Infrastructure) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is appropriately characterised as development for the purposes of a road or road infrastructure facilities and is to be carried out by or on behalf of Transport, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under State Environmental Planning Policy (Resilience and Hazards) 2021, State Environmental Planning Policy (State Significant Precincts) 2005 or State Environmental Planning Policy (Planning Systems) 2021.

### 2.3.2 Other relevant legislation and environmental planning instruments

#### ***Protection of the Environment Operations Act 1997***

Part 5.3 of the Protection of the Environment Operations Act 1997 (POEO Act) prohibits the pollution of waters. As part of the proposal development process, consideration would need to be given to measures to prevent pollution.

Air and noise related pollution is outlined in Part 5.4 and Part 5.5 respectively and requires activities to be carried out in a proper and efficient manner. Section 128 also details the prescribing of standards of air related emissions not to be exceeded as a result of the activity.

Pollution of land and waste is covered by Part 5.6 of the POEO Act. The Act defines 'waste' for regulatory purposes and establishes management and licensing requirements for waste. It defines offences relating to waste and sets penalties. The POEO Act also establishes the ability to set various waste management requirements via the Protection of the Environment Operations (Waste) Regulation 2014.

Part 3.2 of the POEO Act requires an environmental protection licence for scheduled development work and the carrying out of scheduled activities (as set out in Schedule 1 of the POEO Act). Item 35 of Schedule 1 of the POEO Act applies to road construction, meaning the construction, widening or rerouting of roads.

For the purposes of Item 35(2) of Schedule 1 of the POEO Act, consideration would need to be given to whether construction of the proposal within the proposal footprint is likely to trigger the requirement for an environmental protection license.

Item 19 of Schedule 1 applies to land-based extractive activities and defines them as follows:

*...the extraction, processing or storage of extractive materials, either for sale or re-use, by means of excavation, blasting, tunnelling, quarrying or other such land-based methods.*

#### ***Heritage Act 1977***

Natural, cultural and built heritage is protected in NSW under the Heritage Act 1977. The Act is administered by the Heritage Branch (formerly the Heritage Office) within the Office of Environment and Heritage.



The Act provides permanent protection for a heritage item or place. Items of State or local (Section 4A(1) of the Act) heritage significance are defined as

*... a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.*

Section 170 of the Heritage Act 1977 also requires State Government Agencies to keep records of heritage items owned or operated by it.

Where a known heritage item or unexpected heritage find requires disturbance or excavation, a permit under Section 139 is required in certain circumstances.

### ***National Parks and Wildlife Act 1979***

The National Parks and Wildlife Act 1974 (NPW Act) is administered by the Office of Environment and Heritage (OEH). It provides legislative protection for Aboriginal heritage NSW. Part 6 of the Act refers to Aboriginal objects and places and prevents persons from impacting on an Aboriginal place or relic, without consent or a permit.

Roads and Maritime manages their business, legislative and social responsibilities via the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI). This procedure was followed for the proposal.

### ***Coal Mine Subsidence Compensation Act 2017***

Under Section 21 of the Coal Mine Subsidence Compensation Act 2017, a person must not carry out work, or cause work to be done, in connection with the erection or alteration of an improvement within a mine subsidence district, except in accordance with the approval Subsidence Advisory NSW. For the purposes of the Act 'improvement' includes infrastructure, whether above or below the surface of the land.

The investigation area traverses the South Campbelltown Mine Subsidence District (refer to Figure 2.1) and the proposal would therefore require approval under the Coal Mine Subsidence Compensation Act 2017.

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

Under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land.

A referral is not required for proposed road activities that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering an impact to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

## **2.4 Community and agency consultation**

### **2.4.1 SEPP (Transport and Infrastructure) consultation**

Part 2.2 of the SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. This is detailed below:

**Is consultation with Council required under sections 2.10 – 2.12 and 2.14 of SEPP (Transport and Infrastructure)?**

Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of the system?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Will the works involve more than a minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is there a local heritage item (that is not also a state heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the proposal within the coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land? Note: See interactive map here: <a href="http://Coastal%20management%20mapping%20(nsw.gov.au)">Coastal management mapping (nsw.gov.au)</a> . Note the coastal vulnerability area has not yet been mapped. Note: a certified coastal zone management plan is taken to be a certified coastal management program.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No / NA
Are the works located on flood liable land? If so, will the works change flooding patterns to more than a minor extent? Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled <i>Floodplain Development Manual: the management of flood liable land</i> published by the New South Wales Government.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

**Is consultation with a public authority (other than Council) required under sections 2.13, 2.15 and 2.16 of SEPP (Transport and Infrastructure)?**

Are the works located on flood liable land? (to any extent) (SEPP (Transport and Infrastructure) s2.13) If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No / NA
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## Is consultation with a public authority (other than Council) required under sections 2.13, 2.15 and 2.16 of SEPP (Transport and Infrastructure)?

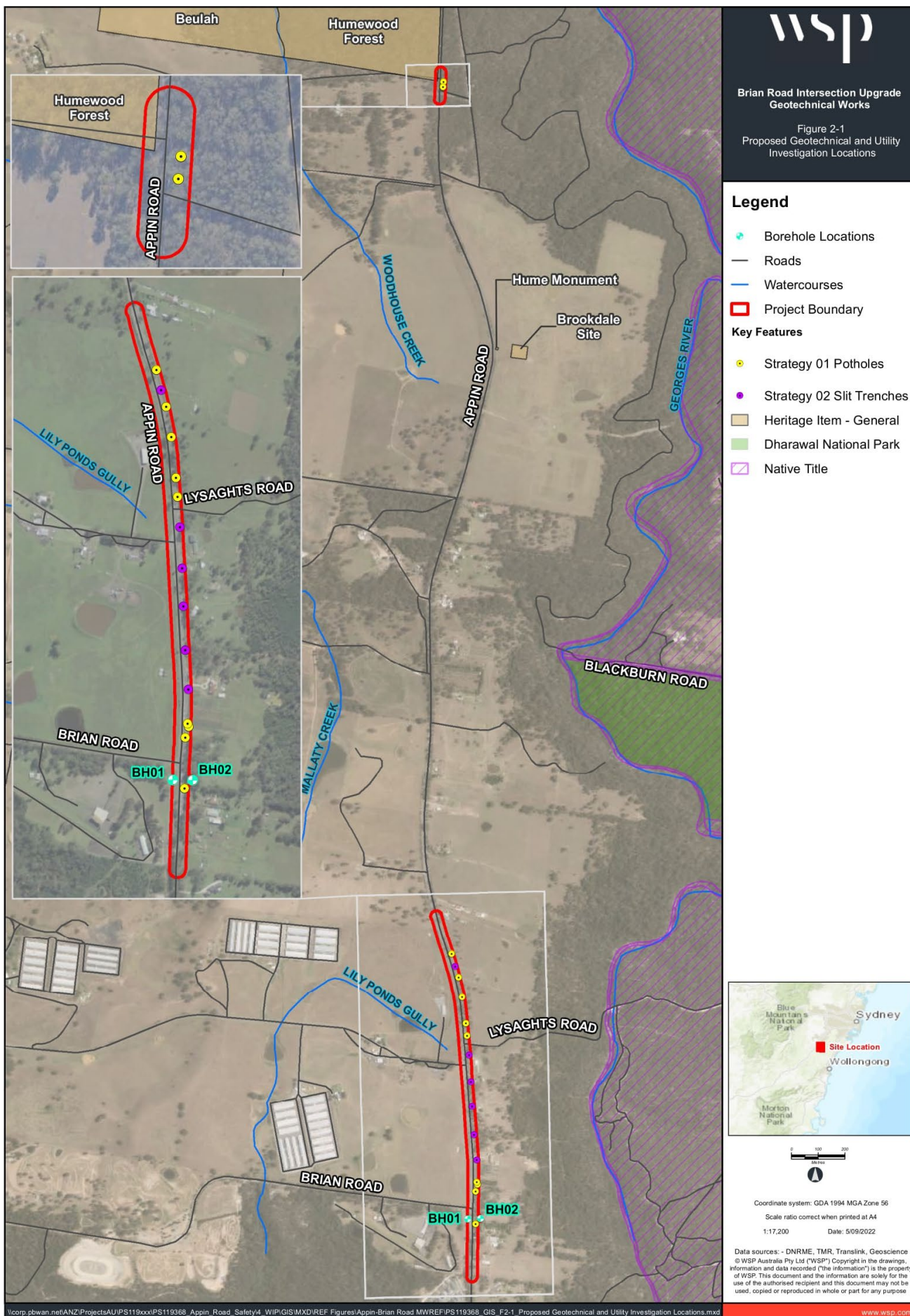
manual entitled <i>Floodplain Development Manual: the management of flood liable land</i> published by the New South Wales Government.		
<i>Are the works adjacent to a national park, nature reserve or other area reserved under the National Parks and Wildlife Act 1974, or on land acquired under that Act?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional facility or group home in bush fire prone land?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map?</i> (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Are the works on buffer land around the defence communications facility near Morundah?</i> (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Are the works on land in a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 1961?</i> The proposed works are located within the South Campbelltown and Appin Mine Subsidence Districts. Subsidence Advisory NSW (SANSW) was notified of the proposal in August 2022 and confirmed approval from SANSW was not required as the work did not include construction of permanent features.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

### 2.4.2 Other agency and community consultation

Given the minor nature of the works agency consultation is not proposed.

Private property owners will be advised of impending investigations on their lands by TfNSW at least two weeks prior to proposed start dates. Following initial contact undertaken by TfNSW, ongoing lines of communication will be managed by the Transport for NSW Community and Place team. Private property access agreements would need to be resolved prior to works on private property. Project information cards will be issued to field staff. The cards provide a hotline that members of the community can contact should they have questions for field staff about the investigation/project.

Figure 2.1 Proposed geotechnical and utility investigation locations



### 3. Environmental assessment

This section provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environmental potentially impacted upon by the proposal are considered. This includes consideration of the factors specified in section 171 of the Environmental Planning and Assessment Regulation 2021. The matters of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* are also considered in section 5. Site-specific safeguards are provided to ameliorate the identified potential impacts.

#### 3.1 Soil

Description of existing environmental and potential impacts		
Are there any known occurrences of salinity or acid sulfate soils in the area?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Does the proposal involve the disturbance of large areas (e.g. >2ha) for earthworks?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Does the site have constraints for erosion and sedimentation controls such as steep gradients or narrow corridors?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>Are there any sensitive receiving environments that are located in or nearby the likely proposal area or that would likely receive stormwater discharge from the proposal?</p> <p>Sensitive receiving environments include (but are not limited to) wetlands, state forests, national parks, nature reserves, rainforests, drinking water catchments). Some adjacent areas have been identified as Threatened Ecological Communities (TECs) and fauna habitats are known to occur in proximity to pothole locations. There are some mapped biodiversity values (threatened species or communities with potential for serious and irreversible impact) adjacent to the proposal site and footprint of the boreholes and fauna underpass. These are provided in Section 3.7. All locations have been inspected and located by an ecologist to avoid significant native vegetation or tree removal. Upon completion of each pothole, cuttings will be placed back in the hole and compacted.</p> <p>Effective erosion and sediment control can be implemented for the types of activities proposed to prevent any erosion or sedimentation in nearby waterways. It is noted that the areas that would be disturbed are small and the disturbance period would be short.</p>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<p>Is there any evidence within or nearby the likely footprint of potential contamination?</p> <p>A search of the NSW Environment Protection Authority contaminated land records for the Campbelltown LGA and Wollondilly LGA was carried out on 20 May 2022. There are no known contaminated sites identified within one kilometre of the study area.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the likely proposal footprint in or nearby highly sloping landform?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the proposals likely to result in more than 2.5ha (area) of exposed soil?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>The proposed geotechnical borehole and utility investigations would result in exposure of some underlying unconsolidated material that would likely cause some sedimentation run-off. Although these impacts may occur, the affected areas would be small and suitable mitigation measures will be implemented to mitigate them.</p>		



## Safeguards

Safeguards to be implemented are:

- Erosion and sediment control measures are to be implemented and maintained to:
  - Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets
  - Reduce water velocity and capture sediment on site
  - Minimise the amount of material transported from site to surrounding pavement surfaces
  - Divert clean water around the site, (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book))
- Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request
- Erosion and sediment control measures are not to be removed until the works are complete, and areas are stabilised.

### 3.2 Waterways and water quality

Description of existing environment and potential impacts		
<i>Is the proposal located within, adjacent to or near a waterway?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the location known to flood or be prone to water logging?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal located within or immediately adjacent to the area managed by WaterNSW covered by chapter 8 of State Environmental Planning Policy (Biodiversity and Conservation) 2021?</i> Note: See map here: <a href="#">Sydney drinking water catchment map</a> .	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Would the proposal be undertaken on a bridge or ferry?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to require the extraction of water from a local water course (not mains)?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
The proposal would result in exposure of underlying unconsolidated material and would therefore have some potential for erosion and downstream sedimentation. The affected areas would be small and suitable mitigation measures will be implemented to address these potential impacts.		

## Safeguards

Safeguards to be implemented are:

- There is to be no release of dirty water into drainage lines and/or waterways.
- Water quality control measures are to be used to prevent any materials (e.g., concrete, grout, sediment etc) entering drain inlets or waterways.
- If an incident (e.g., spill) occurs, the Environmental Incident Classification and Reporting Procedure (Roads and Maritime Services, 2016) is to be followed and the TfNSW Contract Manager and Environment Manager notified immediately.
- An emergency spill kit will be always kept on site. All staff are to be made aware of the location of the spill kit and trained in its use.

### 3.3 Noise and vibration

#### Description of existing environmental and potential impacts

Are there any residential properties or other noise sensitive areas near the location of the proposal that may be affected by the work (i.e. church, school, hospital):

*During construction?*

Yes  No

The borehole locations and potholes (for utility works) for the proposed roundabout and fauna underpass are proposed along Appin Road where the alignment noise is dominated by road traffic noise.

Receivers identified include rural residences and agricultural holdings along Appin Road. The closest receiver (336 Appin Road) is located approximately 10 metres from a proposed slit trench (if required). Other receivers are no closer than 25 metres from the proposed works.

Noise associated with the utility and geotechnical investigations has been assessed in accordance with the RMS 2018 Construction and Maintenance Noise Estimator spreadsheet for residential receivers.

The coring equipment is equivalent to, if not smaller than, a micro drilling rig.

The background noise environment for the proposed works is assumed to be similar to noise area category R2. Rated background levels (RBL) during the day are estimated to be 45 for R2 areas.

Noise management levels (NML) are defined using the method specified in the Construction Noise and Vibration Guidelines (Transport June 2022). and are based on the assumed RBL, plus an additional allowance of 10dB during standard hours.

Where noise levels are above 75dB(A) at residential receivers, they are considered 'highly noise affected' and require additional considerations to mitigate potential impacts.

The noisiest plant proposed for the utility investigation works is expected to be the vacuum truck and is prescribed as 106 LAeq SWL and 81 LAeq at 7m (RMS 2018 Construction and Maintenance Noise Estimator).

The predicted noise levels for the vacuum truck are presented in below, outlining the distances required for mitigation measures.

Table 3.1 Affected residential receptor distances from the proposed activity – vacuum truck

Affected Distances					
Moderately intrusive		Highly intrusive		Highly affected	
Within distance (m)	Mitigation level (dB(A))	Within distance (m)	Mitigation level (dB(A))	Within distance (m)	Mitigation level (dB(A))
30	65	15	75	15	75

The shortest distance to residential receivers from a utility investigation area is approximately 10 metres.

The proposed works (within standard daytime hours) are expected to fall within the moderately to highly intrusive range (greater than 20 db(A)) in one location, and therefore standard mitigation measures apply for all locations, but additional mitigation measures of notification, phone calls and respite offer will be required for 336 Appin Road.

Given that the proposed utility investigations are short in duration (less than 3 hours at any one location) it is unlikely that a respite offer is required.

## Description of existing environmental and potential impacts

The relative noise levels for a micro drilling rig (or smaller) proposed for the utility investigation coring is prescribed as 105 LAeq SWL and 80 LAeq at 7m (RMS 2018 Construction and Maintenance Noise Estimator).

The predicted noise levels for micro drilling rig are presented in Table 3.2 below, outlining the distances required for mitigation measures.

Table 3.2 Affected residential receptor distances from the proposed activity – micro drilling

Affected Distances					
Moderately intrusive		Highly intrusive		Highly affected	
Within distance (m)	Mitigation level (dB(A))	Within distance (m)	Mitigation level (dB(A))	Within distance (m)	Mitigation level (dB(A))
30	65	15	75	15	75

The shortest distance to residential receivers from a geotechnical investigation area is approximately 40 meters.

The proposed works (within standard daytime hours) are expected to fall within the clearly audible range (10 to 20 db(A)), and therefore standard mitigation measures apply with no additional mitigation measures required.

*During operation?*

Yes  No

*Is the proposal going to be undertaken only during standard working hours?*

Yes  No

Standard working hours

Monday-Friday: 7:00am to 6.00pm

Saturday: 8.00am to 1.00pm

Sunday and Public Holidays: no work

*Is any explosive blasting required for the proposal?*

Yes  No

*Would construction noise or vibration from the proposal affect sensitive receivers?*

Yes  No

See above, that the proposed works (within standard daytime hours) are expected to fall within the clearly audible range (10 to 20db(A)), and therefore standard mitigation measures apply with no additional mitigation measures required.

Vibration associated with the utility investigations has been assessed in accordance with the RMS 2018 Construction and Maintenance Noise Estimator spreadsheet for residential receivers.

As this is a qualitative assessment, ground vibration was assessed using the minimum working distances from sensitive receivers' guidelines from the RMS 2018 Construction and Maintenance Noise Estimator spreadsheet.

This guideline lists typical items of vibration intensive plant of which none is proposed for utility investigation work.

Therefore, since the closest sensitive receivers are over 10m away from proposed works and no vibration intensive plant is proposed, the impacts from vibration are considered low, and unlikely to result in cosmetic damage associated with vibration.

Therefore, the proposed works comply with minimal working distances as outlined by RMS 2018 Construction and Maintenance Noise Estimator tool.

Description of existing environmental and potential impacts		
<p><i>Would operation of the proposal alter the noise environment for sensitive receivers?</i></p> <p>This might include, but not be limited to, altering the line or level of an existing carriageway, changing traffic flow, adding extra lanes, increasing traffic volume, increasing the number of heavy vehicles, removing obstacles that provide shielding including changing the angle of view of the traffic, changing the type of pavement, increasing traffic speeds by more than 10km/hr or installing audio-tactile line markings.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal result in vibration being experienced by any surrounding properties or infrastructure during operation?</i></p> <p>Operation of construction plant and equipment would comply with the recommended minimum working distances for vibration intensive plant specified in Section 7.1 of the Construction Noise and Vibration Guideline (Roads and Maritime Services, 2016). There would be no vibration related impacts during operation.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

## Safeguards

Safeguards to be implemented are:

- The standard mitigation measures identified in Appendix B of the Construction Noise and Vibration Guidelines (Transport June 2022) would be implemented
- Notification is to be given to affected community members prior to the works taking place. Notification should be a minimum of 7 calendar days prior to the start of proposed works. The notification is to include:
  - Details of the proposal
  - The duration of works and working hours
  - Any changed traffic or access arrangements
  - How to lodge a complaint or obtain more information
  - Contact name and details.

### 3.4 Air quality

Description of existing environmental and potential impacts		
<p><i>Is the proposal likely to result in large areas (&gt;2ha) of exposed soils?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Are there any dust sensitive receivers located within the vicinity of the proposal during the construction period?</i></p> <p>Rural residences are located adjacent to Appin Road and Brian Road, but in most cases are set back greater than 25 metres with one residential potentially as close as 10 metres. Potential dust impacts would be managed by standard safeguards defined in this Minor Works REF.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Is there likely to be an emission to air during construction?</i></p> <p>Minor exhaust emissions from equipment and vehicles would occur. It is anticipated that the proposal would not result in a material increase in air pollution due to the small number of vehicles and plant to be used. There would be some minor potential for dust generation associated with excavation, resulting in potential for localised nuisance. This potential impact has been addressed by the proposed safeguards.</p>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

## Safeguards

Safeguards to be implemented are:

- Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust.
- Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.

### 3.5 Aboriginal heritage

Description of existing environmental and potential impacts		
<p><i>Would the proposal involve disturbance in any area that has not been subject to previous ground disturbances?</i></p> <p>The proposal site (i.e., the carriageway and immediate roadside area) has been heavily disturbed by previous road construction.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Have online Aboriginal Heritage Information Management System (AHIMS) searches been completed?</i></p> <p>Yes. An Aboriginal Heritage Information Management System (AHIMS) search was conducted on 24 May 2022 and a PACHCI was undertaken on 28 June 2022 (refer Appendix A). The search identified no sites within 200m of the proposal footprint. A search on the NSW State Heritage Inventory did not reveal any Aboriginal sites or places within or within close proximity to the proposal site. A Native Title area is located approximately 300m to the east of the project site (and shown in Figure 2.1). A PACHCI (refer Appendix A) was completed for the MWREF based on Stage 1 of the Procedure for Aboriginal cultural heritage consultation and investigation. The project was assessed as being unlikely to have an impact on Aboriginal cultural heritage, and noted the following:</p> <ul style="list-style-type: none"> <li>• The project is unlikely to harm known Aboriginal objects or places.</li> <li>• The AHIMS search did not indicate moderate to high concentrations of Aboriginal objects or places in the study area (with a 50m buffer).</li> <li>• The study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's Due diligence Code of Practice for the Protection of Aboriginal objects in NSW and the Roads and Maritime Services' procedure.</li> <li>• The cultural heritage potential of the study area appears to be reduced due to past disturbance.</li> </ul>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<p><i>Is there potential for the proposal to impact on any items of Aboriginal heritage?</i></p> <p>There are no known Aboriginal sites near the proposal site.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal involve the removal of mature native trees?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposals impact on any features that may indicate any potential archaeological remains?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No



## Description of existing environmental and potential impacts

*Is the proposal consistent with the requirements of the legacy Roads and Maritime Procedure for Aboriginal cultural heritage consultation and investigation (PACHCI)?*  
This is attached to Appendix A.

Yes

No

## Safeguards

Safeguards to be implemented are:

- If Aboriginal heritage items are uncovered during the works, all works must cease in the vicinity of the find and the TfNSW Aboriginal cultural heritage advisor and the Environment Manager contacted immediately. The steps in the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services, 2015) must be followed.

## 3.6 Non-Aboriginal heritage

### Description of existing environmental and potential impacts

*Have online heritage database searches been completed?*

- Transport (including legacy Roads and Maritime) section 170 register
- NSW Heritage database
- Commonwealth EPBC heritage list
- Australian Heritage Places Inventory
- Local Environmental Plan(s) heritage items

Yes

No

*Are there any items of non-Aboriginal heritage or heritage conservation areas listed on relevant heritage databases/registers that are located within the vicinity of the proposal?*

The Humewood Forest, a local listed heritage item, is located at 767 Appin Road Gilead (refer Figure 2.1) and is within close proximity to the proposed works in the northern section of the alignment (approximately 50 m north of the proposed works). Due to the minor nature of the proposed works and the implementation of mitigation measures, this heritage listed item would not be impacted by the proposal.

Yes

No

*Are there any items of potential non-Aboriginal heritage significance which are not listed on relevant heritage databases/registers that are in the vicinity of the proposal?*

Yes

No

*Is the proposal likely to occur in or near features that indicate potential archaeological remains?*

Yes

No

## Safeguards

Safeguards to be implemented are:

- If unexpected archaeological remains are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services, 2015) must be followed. The TfNSW Environment Manager must be contacted immediately.
- If any items defined as relics under the NSW *Heritage Act 1977* are uncovered during the works, all works will cease in the vicinity of the find and the TfNSW Senior Environment Specialist - Heritage contacted immediately.

### 3.7 Biodiversity

Description of existing environmental and potential impacts		
<p><i>Have relevant database searches been carried out?</i></p> <ul style="list-style-type: none"> <li>• NSW BioNet, Atlas of NSW Wildlife database search (10km radius) updated 25 May 2022 (Appendix B)</li> <li>• Commonwealth EPBC Act Protected Matters Search Tool (PMST) (0.5km radius) updated 25 May 2022 (Appendix B).</li> </ul> <p>A WSP Ecologist also conducted a site visit to the study area (see locations in Figure 3.1) on the 18<sup>th</sup> of May 2022 to assess the locations of the proposed geotechnical and utility investigations (refer Appendix B). The ecologist conducted flora and fauna surveys at each location within a 5m<sup>2</sup> area. This involved assessing vegetation against best fitting Plant Community Type (PCT) and describing its level of condition.</p> <p>The site inspection focused on verifying existing vegetation mapping and searching for threatened species in the specific areas proposed for geotechnical and utility investigations (refer Appendix B).</p>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<p>Did the database searches identify any endangered ecological communities, threatened flora and/or threatened or protected fauna, or migratory species in or within the vicinity of the proposed works? Both Commonwealth and State listed matters must be considered.</p> <p>The site assessment showed that all test locations will avoid all existing juvenile or mature trees existing in the study area. However, due to the nature of the works there will be an impact to ground layer vegetation from the following three vegetation types:</p> <ul style="list-style-type: none"> <li>• Exotic pasture vegetation (two potholes or one slit trench).</li> <li>• Cumberland Plain Woodland – moderate condition (seven potholes or five slit trenches and two boreholes).</li> <li>• Shale Sandstone Transition Forest – moderate/good condition (two pothole).</li> <li>• Cumberland Plain Woodland corresponds to Plant Community Type 849: Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion.</li> <li>• Shale Sandstone Transition Forest corresponds to Plant Community Type 1395: Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion.</li> </ul> <p>Only two of the investigation work locations are likely to involve the removal of mostly native groundcovers or shrubs during the works. Although seven locations are in moderate condition Cumberland Plain Woodland, this classification is due to the presence of canopy species only and in these areas the mid-storey and under-storey vegetation was dominated by exotic vegetation. Overall, impacts to native vegetation are likely to be minimal given the dominance of weed species in the ground layer.</p> <p><b>TECs</b></p> <p>There are two BC Act listed TECs identified within the study area:</p> <ul style="list-style-type: none"> <li>• Cumberland Plain Woodland in the Sydney Basin Bioregion.</li> <li>• Shale Sandstone Transition Forest in the Sydney Basin Bioregion.</li> </ul>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

## Description of existing environmental and potential impacts

### Threatened flora species

Twenty-one BC Act listed threatened plant species and two endangered populations listed under the BC Act have been previously recorded in the locality based on the BioNet Atlas search (see Appendix B). During the current field survey no BC Act listed threatened plant species were recorded in the study area.

### Threatened fauna species

Based on the BioNet Atlas search, 57 threatened fauna species listed under the BC Act have been previously identified in the locality (see Appendix B). This includes 18 mammals, 30 birds, four frogs, two reptiles and three invertebrates.

The study area is known to provide habitat for threatened animal species including the Koala and Little Lorikeet and is considered likely to provide habitat for a number of other threatened species including:

- Woodland Birds (Flame Robin, Dusky Woodswallow, Varied Sittella, Scarlet Robin, Hooded Robin, Speckled Warbler, Diamond Firetail, Gang-Gang Cockatoo, Glossy Black-cockatoo).
- Blossom Dependent Species (Regent Honeyeater, Black-chinned Honeyeater, Swift Parrot, Grey-headed Flying-fox).
- Large Forest Owls (Powerful Owl, Masked Owl, Barking Owl).
- Raptors (Little Eagle, Square-tailed Kite)
- Microchiropteran Bats (Greater Broad-nosed Bat, Eastern False Pipistrelle, Little Bent-wing Bat, Large Bent-wing Bat, Eastern Freetail Bat, Southern Myotis, Yellow-bellied Sheath-tail-bat, Large-eared Pied Bat).
- Gliders (Squirrel Glider, Yellow-bellied Glider)
- Spotted-tailed Quoll
- Cumberland Plain Land Snail
- Rosenberg's Goanna.

These species listed above are considered to have a moderate likelihood of occurrence.

While these threatened fauna species are either known to occur or are considered likely to occur in the habitat, the impact of the proposed geotechnical and utility investigation work on the habitat for these species will be negligible. The species with the most potential to be impacted is Cumberland Plain Land Snail as work will disturb the ground layer. However, Cumberland Plain Land Snail was not located in any of the proposed work areas during the site inspections.

*Is the proposal likely to impact nationally listed threatened species, ecological communities or migratory species?*

Yes  No

### TECs

According to the Protected Matters Search Tool (PMST) 9 EPBC Act listed TECs are known to occur, likely to occur, or may occur in the locality. Of these 9 TECs, the study area contains vegetation corresponding to the following two EPBC Act listed TECs:

- Shale Sandstone Transition Forest of the Sydney Basin Bioregion
- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest.

Within the study area, Cumberland Plain Woodland – moderate condition corresponds to the EPBC Act listed Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest TEC. The Shale Sandstone Transition Forest –

## Description of existing environmental and potential impacts

moderate/good condition corresponds to the EPBC Act listed Shale Sandstone Transition Forest of the Sydney Basin Bioregion TEC.

### Threatened flora species

Based on the results of the PMST search, 23 EPBC Act listed threatened plant species have the potential to occur within the search area (see Appendix B). During the current field survey no EPBC Act listed threatened plant species were recorded in the study area. No threatened plant species were found during previous work undertaken.

### Threatened fauna species

Based on the results of the PMST search, 29 EPBC Act listed threatened animal species have the potential to occur within the search area including 12 birds, five frogs, nine mammals, two reptiles and one invertebrate species (see Appendix B). Marine and wading bird species and fish have been excluded from assessment as there is no suitable habitat in the study area.

Based on the site inspection and the work undertaken for the Appin Road Safety Improvements Ecological Impact Assessment (EcoLogical, 2018), the following EPBC Act listed threatened fauna species are known to occur or are considered likely to occur based on the presence of suitable habitat:

- Gang-Gang Cockatoo
- Regent Honeyeater
- Swift Parrot
- White-throated Needletail
- Large-eared Pied Bat
- Grey-headed Flying-fox
- Koala
- Yellow-bellied Glider
- Spotted-tailed Quoll.

While these threatened fauna species are either known to occur or are considered likely to occur in the habitat, the impact of the proposed geotechnical and utility investigation work on the habitat for these species will be negligible as impacts are limited to small areas of ground layer which will not impact on the lifecycles of the EPBC Act listed fauna species listed above.

The White-throated Needletail spends the non-breeding season in Australia and is primarily aerial. As such, this species may fly over the study area as part of normal movement patterns and this species not considered relevant to this assessment as no habitat for this species will be impacted directly or indirectly.

### Migratory species

The results of the PMST indicate that 14 listed migratory species may occur in the locality. These species include a number of migratory wetland birds that do not have any habitat within or near the study area so have been excluded from the assessment.

Of the listed migratory species, the following are considered moderately likely to occur in, or fly over, the study area based on the presence of potentially suitable habitats:

- migratory marine birds – Fork-tailed Swift
- migratory terrestrial species – White-throated Needletail.

The Fork-tailed Swift and White-throated Needletail spend the non-breeding season in Australia and are primarily aerial. As such, they may fly over the study area as part

## Description of existing environmental and potential impacts

of normal movement patterns and are not considered relevant to this assessment as no habitat for these species will be impacted directly or indirectly.

While some migratory species of bird are likely to use the study area and locality, the study area would not be classed as an 'important habitat'. A nationally significant proportion of a population would not be supported by the habitats in the study area. The project would not substantially modify, destroy or isolate an area of important habitat for the migratory species, and it would not seriously disrupt the lifecycle of an ecologically significant proportion of a population of migratory birds.

*Would the proposal require the removal of any other vegetation?*

For this assessment, it is assumed that disturbances to vegetation would be limited to the disturbance/removal of groundcover and understorey vegetation only. It is assumed that no native overstorey vegetation (including hollow bearing trees) would be impacted by the proposed works. Areas of impact have been calculated to accommodate a 5 square metre area of disturbance at each pothole within the study area, however the pothole will likely only take up to several 300mm diameter holes within this marked area. This total overall impact is likely between 0.3 to 0.9 m<sup>2</sup> per pothole location, and between 1.8 to 2.1 m<sup>2</sup> per slit trench. Taking a conservative approach, the total considered impact for this assessment is approximately 5m<sup>2</sup> at each investigation work location (bore hole, pothole, and slit trench) totalling 80 m<sup>2</sup>. This is an overestimate of the potential impact but is still regarded as negligible.

The predicted impacts on native ecological communities are as follows:

- Cumberland Plain Woodland – moderate condition: two bore holes and seven potholes (or two bore holes and five slit trenches) equal to an impact of up to 70 m<sup>2</sup>
- Shale Sandstone Transition Forest – moderate/good condition: two potholes equal to an impact of up to 10 m<sup>2</sup>

Note that some potholes may be replaced with an equivalent size slit trench for an equivalent impact.

- Total impact to habitat for threatened fauna species is approximately 80 m<sup>2</sup>.

For the purpose of the Transport Biodiversity Policy (Transport for NSW, 2022), projects will have achieved a no net loss where the expected loss from infrastructure development has been:

- Avoided to the extent reasonably practicable; and
- Mitigation measures, including measures to reduce habitat fragmentation effects, have been applied to the extent reasonably practicable; and
- Offsets have been provided through either credit purchase or BCF payment of the required number and type of biodiversity credits in accordance with the BAM or TfNSW guidelines; and/or
- Conservation measures have been delivered in accordance with the requirements of this policy and guidelines.

However, the TfNSW biodiversity offset threshold exclusions (Transport for NSW, 2022) include "*Works within areas that are reasonably likely to naturally regenerate*". It is considered that these small areas of proposed disturbance are likely to be able to naturally regenerate and as such biodiversity offsets should not be required.

Yes

No

Description of existing environmental and potential impacts		
<p><i>Would the proposal affect any tree hollows or hollow logs?</i></p> <p>No significant native vegetation or tree removal will be undertaken during proposed works</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Are there any known areas of outstanding biodiversity value or areas mapped as 'littoral rainforest' or 'coastal wetland' under chapter 2 of State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP (Resilience and Hazards)) in or within the vicinity of the proposed work?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal provide any additional barriers to the movement of wildlife?</i></p> <p>No barriers to movement would be introduced.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal disturb any natural waterways or aquatic habitat?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal disturb any crevices or other locations (such as on bridges and culverts) for potential bat habitat?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

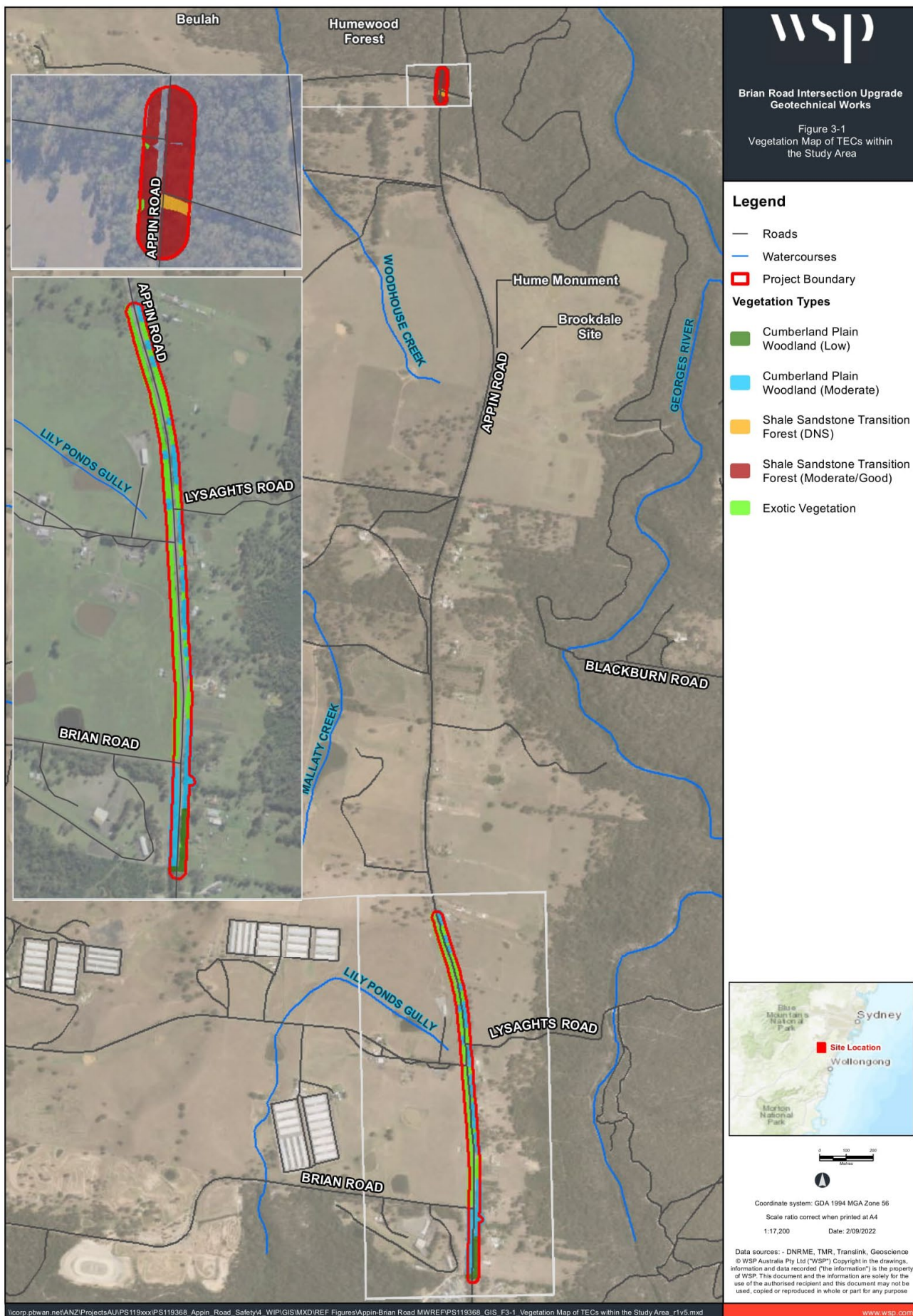
## Safeguards

Safeguards to be implemented are:

- If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Unexpected Threatened Species Find Procedure in Guide 1 – Pre-clearing process of the Biodiversity Guidelines (Roads and Traffic Authority, 2011)
- Ensure any fauna encountered onsite would be managed in accordance with *Biodiversity Guidelines, Guide 9* (fauna handling) (Roads and Maritime, 2016)
- Prior to commencing works, engineers will conduct a toolbox talk regarding possible Cumberland Plain Land Snail habitat features that may be present within the locality of each investigation site (particularly the two potholes located in Shale Sandstone Transition Forest). Ensuring that where possible works will be undertaken in open grass areas away from woody debris
- No significant native vegetation or tree removal will be undertaken during proposed works. The drill rig will only be parked on grassed or disturbed areas and given the drill rig height (with mast erected), treed areas will be avoided. Boreholes will create an impact of 100mm in diameter and will be positioned in grassed or disturbed areas
- No clearing to be undertaken for the purpose of access arrangements.



Figure 3.1 Vegetation mapping showing TECs along the study area



### 3.8 Trees

Description of existing environmental and potential impacts		
<i>Does the proposal involve pruning, trimming or removal of any tree/s?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Do the trees form part of a streetscape, an avenue or roadside planting?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Have the trees been planted by a community group, Landcare group or by council or is the tree a memorial or part of a memorial group e.g. has a plaque?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Do the trees form part of a heritage listing or have other heritage value?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

### Safeguards

Safeguards to be implemented are:

- The drill rig may be parked on grassed surfaces (short-term) for some of the boreholes. Treed areas will be avoided given the drill rig height with mast erected, and therefore, no pruning or trimming of trees will be needed
- Vehicles may be parked on grassed surfaces (short-term) for some of the work. Treed areas will be avoided given the vehicle height, and therefore, no pruning or trimming of trees will be undertaken.

### 3.9 Traffic and transport

Description of existing environmental and potential impacts		
<i>Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during construction?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to affect any other transport nodes or transport infrastructure (e.g. bus stops, bus routes) in the surrounding area? Or result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>There are a couple bus stops along Appin Road that are used by the route 887 bus service (Campbelltown to Ambarvale, Rosemeadow and Wollongong). Bus stops would remain operational during works. Bus services would not be affected by works.</p>		
<p>The works proposed are minor and of short duration, and outside of the road. Therefore, impacts to traffic and transport would be minimal.</p>		

### Safeguards

Safeguards to be implemented are:

- A traffic control plan will be prepared in accordance with Traffic control at work sites (Roads and Traffic Authority, 2010) and Road Occupancy Licences (ROL) will take place following confirmation of borehole locations and utility pothole locations.
- No work is to occur within 3m of the fog line of Appin Road without traffic control and a Traffic Control Plan (TCP)
- No boreholes are planned within the roadway
- All site investigation work is proposed to be undertaken during daytime hours.



### 3.10 Socio-economic

Description of existing environmental and potential impacts		
<i>Is the proposal likely to impact on local business?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to require any property acquisition?</i> The proposal would not require any property acquisition. As discussed above, drive-on, drive-off access has been assumed for all investigation locations. The two boreholes for the underpass investigations are proposed to be positioned within private property (Lot 10 DP242891, Lot 1 DP34466, Lot 8 DP706695, Lot 104 DP1188670). This will be communicated to property owners by TfNSW prior to site works.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to alter any access for properties (either temporarily or permanently)?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to alter any on-street parking arrangements (either temporarily or permanently)?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to change pedestrian movements or pedestrian access (either temporarily or permanently)?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to impact on any items or places of social value to the community (either temporarily or permanently)?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>Is the proposal likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)?</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

### Safeguards

Safeguards to be implemented are:

- Any complaints received during the undertaking of the works are to be recorded and addressed within a reasonable time.
- It is assumed that any nearby residents will be notified a minimum of seven days prior to the commencement of proposed works. The notification will include contact details of the relevant works supervisor to allow any complaints and / or queries to be addressed.

### 3.11 Landscape character and visual amenity

Description of existing environmental and potential impacts		
<p><i>Is the proposed work over or near an important physical or cultural element or landscape? (e.g. heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc)?</i></p> <p>As discussed, the proposal is located near some heritage items and the Dharawal State Conservation Area. Impacts on these items and areas is not expected due to the minor nature of the works and the proposed safeguards.</p>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<p><i>Would the proposal obstruct or intrude upon the character or views of a valued landscape or urban area. For example, locally significant topography, a rural landscape or a park, a river, lake or the ocean or a historic or distinctive townscape or landmark?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal require the removal of mature trees or stands of vegetation, either native or introduced?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal result in large areas of shotcrete visible from the road or adjacent properties?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal involve new noise walls or visible changes to existing noise walls?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal involve the removal or reuse of large areas of road corridor, landscape, either verges or medians?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would the proposal involve substantial changes to the appearance of a bridge (including piers, girders, abutments and parapets) that are visible from the road or residential areas?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>If involving lighting, would the proposal create unwanted light spillage on residential properties at night (in construction or operation)?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p><i>Would any new structures or features to be constructed result in over-shadowing to adjoining properties or areas?</i></p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

### Safeguards

Safeguards to be implemented are:

- Working areas are to be maintained, kept free of rubbish, and cleaned up at the end of each working day.

### 3.12 Waste

Description of existing environmental and potential impacts		
Is the proposal likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the proposal likely to require a licence from EPA?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the proposal likely to require the removal of asbestos?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

### Safeguards

Safeguards to be implemented are:

- Resource management hierarchy principles are to be followed:
  - Avoid unnecessary resource consumption as a priority
  - Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling, and energy recovery)
  - Disposal is undertaken as a last resort (in accordance with the *Waste Avoidance and Resource Recovery Act 2001*)
- Waste material is to be reused in accordance with any waste exemptions or disposed of legally in accordance with its waste classification
- Waste material is not to be left on site once the works have been completed
- Working areas is to be maintained, kept free of rubbish, and cleaned up at the end of each working shift.

## 4. Consideration of State and Commonwealth environmental factors

### 4.1 Environmental Planning and Assessment Regulation 2021 checklist

The following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have been considered to assess the likely impacts of the proposal on the natural and built environment. This consideration is required to comply with sections 5.5 and 5.7 of the EP&A Act.

Environmental factor	Impact
<p><b>(a) Any environmental impact on a community?</b></p> <p>The proposed investigations would have minor and short-term impact on the community attributable to some plant/equipment noise and temporary visual amenity. The proposal would assist in upgrading and improving the safety of the road following the completion of the Brian Road Intersection Upgrade works. Safeguards have been proposed to address identified potential impacts.</p>	<p>Negative (short-term)</p> <p>Positive (long-term)</p>
<p><b>(b) Any transformation of a locality?</b></p> <p>The proposed work would not transform the locality, as works would be limited in scope, extent and duration. The project footprint would be small and short-term with no change on the existing environment.</p>	<p>Nil</p>
<p><b>(c) Any environmental impact on the ecosystems of a locality?</b></p> <p>Should any borehole location be proposed within or in proximity that may impact any local ecosystem, locations will be shifted to mitigate the impact. The proposal would have negligible environmental impacts on local ecosystems given its nature and duration.</p>	<p>Nil</p>
<p><b>(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</b></p> <p>During the borehole and utility investigations, minor and temporary reduction in aesthetic value is anticipated. Local road users and nearby residents are likely to have short-term exposure. However, safeguards have been proposed to address identified potential impacts.</p>	<p>Negative (short-term)</p>
<p><b>(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</b></p> <p>The proposed investigations would temporarily affect a section of Appin Road. This will be managed by the safeguards discussed in Section 3.9 for other areas of concern are anticipated along the route.</p>	<p>Negative (short-term)</p>
<p><b>(f) Any impact on habitat of any protected animals (within the meaning of the Biodiversity Conservation Act 2016)?</b></p> <p>If not monitored, the project is likely to have an impact on the local system, but the impact is expected to be mitigated through implementation of the safeguards discussed in Section 3 of this REF. The proposal would not affect important habitat for protected or endangered fauna. Refer to Section 3.7.</p>	<p>Nil</p>

Environmental factor	Impact
<p><b>(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</b></p> <p>Geotechnical and utility investigations for the fauna underpass and roundabout will occur in areas of cut and fill locations. Locations may shift depending on existing vegetation or sites with known ecological impacts.</p> <p>Safeguards will be implemented as discussed in Section 5.</p>	Nil
<p><b>(h) Any long-term effects on the environment?</b></p> <p>Geotechnical and utility investigations form part of a broader project to improve road user safety.</p>	Nil
<p><b>(i) Any degradation of the quality of the environment?</b></p> <p>Any impacts that would be generated from these works (e.g. noise, visual, socio-economic, transport) would be minor. Mitigation measures have been proposed to address potential impacts.</p>	Negative (short-term)
<p><b>(j) Any risk to the safety of the environment?</b></p> <p>The proposal would involve minimal risk to the safety of the environment due to the scale of work and due to the implementation of appropriate work health and safety measures. This proposal would improve the safety of the environment long-term.</p>	Positive (long term)
<p><b>(k) Any reduction in the range of beneficial uses of the environment?</b></p> <p>Geotechnical and utility investigations will have an impact on the adjacent traffic flow along Appin Road, which will likely include single lane flow, reducing speed limit. It would potentially increase travelling time for road users in the short-term.</p> <p>The proposed works would not reduce the range of beneficial uses of the environment.</p>	Negative (short-term)
<p><b>(l) Any pollution of the environment?</b></p> <p>Pollution of the environment is not expected to result from the works with the implementation of appropriate safeguards.</p>	Nil
<p><b>(m) Any environmental problems associated with the disposal of waste?</b></p> <p>Upon completion of each borehole, the cuttings will be placed back in the hole and compacted. If any other waste is expected to be domestic waste and would be contained for disposal to approved recycling facilities or to licenced landfill in accordance with the safeguards in Section 3.12 of this REF.</p> <p>Upon completion of each pothole, the material will be placed back in the hole and compacted. If any other waste is expected to be domestic waste and would be contained for disposal to approved recycling facilities or to licenced landfill in accordance with the safeguards in Section 3 of this REF.</p>	Nil
<p><b>(n) Any increased demands on resources, natural or otherwise which are, or are likely to become, in short supply?</b></p> <p>The works proposed would not increase demand for resources, which are, or likely to become, in short supply.</p>	Nil
<p><b>(o) Any cumulative environmental effect with other existing or likely future activities?</b></p> <p>Given the nature of works and potential impacts if any are minor, cumulative impacts are unlikely.</p>	Nil

Environmental factor	Impact
<p><b>(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</b></p> <p>The proposal would not have any effect on coastal processes or coastal hazards.</p>	Nil
<p><b>(q) Any impact on applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1?</b></p> <p>The proposal would not have any effect on applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1.</p>	Nil
<p><b>(r) Any impact on other relevant environmental factors?</b></p> <p>The proposal would not have any impact on other relevant environmental factors.</p>	Nil

## 4.2 Matters of National Environmental Significance checklist

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance are required to be considered to:

- Assist in determining whether the proposal should be referred to the Australian Government Department of Agriculture, Water and the Environment
- For nationally listed threatened species, ecological communities and migratory species, whether the impacts are significant and should be assessed via a Project REF.

Factor	Impact
<p><b>(a) Any impact on a World Heritage property?</b></p> <p>There are no world heritage properties near or around the proposed site locations. Direct or indirect impacts are not expected.</p>	Nil
<p><b>(b) Any impact on a National Heritage place?</b></p> <p>There are no national heritage sites/places proximate to any of the borehole locations. Direct or indirect impacts are not expected.</p>	Nil
<p><b>(c) Any impact on a wetland of international importance (often called 'Ramsar' wetlands)?</b></p> <p>There are no wetlands of international importance proximate to any of the borehole or utility proposed locations.</p>	Nil
<p><b>(d) Any impact on nationally threatened species, ecological communities or migratory species?</b></p> <p>A variety of Commonwealth listed threatened species and threatened ecological communities have the potential to occur in the local area. Given the nature of work to be undertaken at proposed borehole locations and the measures to be implemented, impacts on these species or their habitat are not anticipated.</p>	Nil
<p><b>(e) Any impact on a Commonwealth marine area?</b></p> <p>There would be no environmental impact on a Commonwealth Marine area.</p>	Nil

Factor	Impact
<p><b>(f) Does the proposal involve a nuclear action (including uranium mining)?</b>  The proposal does not constitute a nuclear action.</p>	Nil
<p><b>Additionally, any impact (direct or indirect) on the environment of Commonwealth land?</b>  Commonwealth land would not be affected by the proposal.</p>	Nil

## 5. Summary of safeguards and environmental management measures

This section provides a summary of the site specific environmental safeguards and management measures identified in described in chapters 3 and 4 of this REF. These safeguards will be implemented to reduce potential environmental impacts throughout construction and operation. A framework for managing the potential impacts is provided with reference to environmental management plans and relevant Transport QA specifications. Any potential licence and/or approval requirements required prior to construction are also listed

Table 5.1 Summary of site-specific safeguards for proposed work

Safeguards for the proposed work	
Soil	<ul style="list-style-type: none"> <li>• Erosion and sediment control measures are to be implemented and maintained to:               <ul style="list-style-type: none"> <li>○ Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets</li> <li>○ Reduce water velocity and capture sediment on site</li> <li>○ Minimise the amount of material transported from site to surrounding pavement surfaces</li> <li>○ Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book))</li> </ul> </li> <li>• Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request</li> <li>• Erosion and sediment control measures are not to be removed until the works are complete, and areas are stabilised.</li> </ul>
Waterways and water quality	<ul style="list-style-type: none"> <li>• There is to be no release of dirty water into drainage lines and/or waterways</li> <li>• Water quality control measures are to be used to prevent any materials (e.g., concrete, grout, sediment etc) entering drain inlets or waterways</li> <li>• If an incident (e.g., spill) occurs, the Environmental Incident Classification and Reporting Procedure (Roads and Maritime Services, 2016) is to be followed and the TfNSW Contract Manager and Environment Manager notified immediately</li> <li>• An emergency spill kit will be always kept on site. All staff are to be made aware of the location of the spill kit and trained in its use.</li> </ul>
Noise and vibration	<ul style="list-style-type: none"> <li>• The standard mitigation measures identified in Appendix B of the Construction Noise and Vibration Guideline (Roads and Maritime Services, 2016) would be implemented</li> <li>• Notification is to be given to affected community members prior to the works taking place. Notification should be a minimum of 7 calendar days prior to the start of proposed works. The notification is to include:               <ul style="list-style-type: none"> <li>○ Details of the proposal</li> <li>○ The duration of works and working hours</li> <li>○ Any changed traffic or access arrangements</li> <li>○ How to lodge a complaint or obtain more information</li> <li>○ Contact name and details.</li> </ul> </li> </ul>



## Safeguards for the proposed work

	<ul style="list-style-type: none"> <li>• A phone call to residences within 15 metres of the proposed works. This should be a minimum of 7 calendar days prior to the start of proposed works. The notification is to include: <ul style="list-style-type: none"> <li>○ Details of the proposal</li> <li>○ The duration of works and working hours</li> <li>○ Any changed traffic or access arrangements</li> <li>○ How to lodge a complaint or obtain more information</li> <li>○ Contact name and details.</li> </ul> </li> </ul>
Air quality	<ul style="list-style-type: none"> <li>• Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust</li> <li>• Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.</li> </ul>
Aboriginal heritage	<ul style="list-style-type: none"> <li>• If unexpected Aboriginal heritage items are uncovered during the works, all works must cease in the vicinity of the find and the TfNSW Aboriginal cultural heritage advisor and the Environment Manager contacted immediately. The steps in the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services, 2015) must be followed.</li> </ul>
Non-Aboriginal heritage	<ul style="list-style-type: none"> <li>• If unexpected archaeological remains are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Standard Management Procedure: Unexpected Heritage Items (Roads and Maritime Services, 2015) must be followed. The TfNSW Environment Manager must be contacted immediately</li> <li>• If any items defined as relics under the NSW <i>Heritage Act 1977</i> are uncovered during the works, all works will cease in the vicinity of the find and the TfNSW Senior Environment Specialist - Heritage contacted immediately.</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>• If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Unexpected Threatened Species Find Procedure in Guide 1 – Pre-clearing process of the Biodiversity Guidelines (Roads and Traffic Authority, 2011)</li> <li>• Ensure any fauna encountered onsite would be managed in accordance with Biodiversity Guidelines, Guide 9 (fauna handling) (Roads and Maritime, 2016)</li> <li>• Prior to commencing works, engineers will conduct a toolbox talk regarding possible Cumberland Plain Land Snail habitat features that may be present within the locality of each investigation site (particularly the two potholes located in Shale Sandstone Transition Forest). Ensuring that where possible works will be undertaken in open grass areas away from woody debris</li> <li>• No significant native vegetation or tree removal will be undertaken during proposed works. The drill rig will only be parked on grassed or disturbed areas and given the drill rig height (with mast erected), treed areas will be avoided. Boreholes will create an impact of 100mm in diameter and will be positioned in grassed or disturbed areas</li> <li>• No clearing to be undertaken for the purpose of access arrangements.</li> </ul>

## Safeguards for the proposed work

Trees	<ul style="list-style-type: none"> <li>• Prior to work commencing, boreholes and utility sites will be micro sited on site with an ecologist and geotechnical engineer to determine the most optimal location for boreholes and associated infrastructure to avoid any significant impact to any significant native vegetation or trees. Borehole and utility disturbance will generally be short term and within grassed or disturbed areas. The drill rig may be parked on grassed surfaces (short-term) for some of the boreholes. To minimise impacts, boreholes would generally been positioned in open areas. Treed areas will be avoided given the drill rig height with mast erected, and therefore, no pruning or trimming of trees will be needed</li> <li>• Vehicles may be parked on grassed surfaces (short-term) for some of the work. Treed areas will be avoided given the vehicle height, and therefore, no pruning or trimming of trees will be undertaken.</li> </ul>
Traffic and transport	<ul style="list-style-type: none"> <li>• A traffic control plan will be prepared in accordance with Traffic control at work sites (Roads and Traffic Authority, 2010) and Road Occupancy Licences (ROL) will take place following confirmation of borehole locations</li> <li>• No work is to occur within 3m of the fog line of Appin Road without traffic control and a Traffic Control Plan (TCP)</li> <li>• No boreholes are planned within the roadway</li> <li>• All site investigation work is proposed to be undertaken during daytime hours.</li> </ul>
Socio-economic	<ul style="list-style-type: none"> <li>• Any complaints received during the undertaking of the works are to be recorded and addressed within a reasonable time</li> <li>• It is assumed that any nearby residents will be notified a minimum of seven days prior to the commencement of proposed works. The notification will include contact details of the relevant works supervisor to allow any complaints and / or queries to be addressed.</li> </ul>
Landscape character and visual amenity	<ul style="list-style-type: none"> <li>• Working areas are to be maintained, kept free of rubbish, and cleaned up at the end of each working day.</li> </ul>
Waste	<ul style="list-style-type: none"> <li>• Resource management hierarchy principles are to be followed:             <ul style="list-style-type: none"> <li>○ Avoid unnecessary resource consumption as a priority</li> <li>○ Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling, and energy recovery)</li> <li>○ Disposal is undertaken as a last resort. (in accordance with the Waste Avoidance and Resource Recovery Act 2001)</li> </ul> </li> <li>• Waste material is to be reused in accordance with any waste exemptions or disposed of legally in accordance with its waste classification</li> <li>• Waste material is not to be left on site once the works have been completed</li> <li>• Working areas is to be maintained, kept free of rubbish, and cleaned up at the end of each working shift.</li> </ul>

## 5.1 Licensing and approvals

List of licences and/or approvals required for the proposal:

Table 5.2 Summary of licensing and approval required

Instrument	Requirement	Timing
<i>Roads Act 1993 (s138)</i>	Road occupancy licence to dig up, erect a structure or carry out work in, on or over a road	Prior to start of the activity

## 5.2 Other requirements

Table 5.3 Other requirements relevant to the proposal

Requirement		
Environmental management plan sent to SMES for review.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Traffic control plans	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

## 6. Certification, review and decision

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### 6.1 Certification

This minor works REF provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal.

***Prepared by:***



Annie Pinnock

Environmental Consultant

WSP

Date: 13.09.2022

***Minor Works REF reviewed by:***



Louise MacDonald

Principal Environment Manager

WSP

Date: 13.09.2022

## 6.2 Environment staff review

The Minor Works REF has been reviewed and considered against the requirements of sections 5.5 and 5.7 of the EP&A Act.

In considering the proposal this assessment has examined and taken into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of that activity as addressed in the Minor Works REF and associated information. This assessment is considered to be in accordance with the factors required to be considered under section 171 of the Environmental Planning and Assessment Regulation 2021.

The proposal described in the Minor Works REF will have some environmental impacts which can be ameliorated satisfactorily. Having regard to the safeguard and management measures proposed, this assessment has considered that these impacts are unlikely to be significant and therefore an approval for the proposal does not need to be sought under Division 5.2 of the EP&A Act.

The assessment has considered the potential impacts of the activity on areas of outstanding value and on threatened species, ecological communities or their habitats for both terrestrial and aquatic species as defined by the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994*.

The proposal described in the Minor Works REF will not affect areas of outstanding value. The activity described in the Minor Works REF will not significantly affect threatened species ecological communities or their habitats. Therefore a species impact statement is not required.

The assessment has also addressed the potential impacts on the activity on matters of national environmental significance and any impacts on the environment of Commonwealth land and concluded that there will be no significant impacts. Therefore there is no need for a referral to be made to the Australian Government Department of Agriculture, Water and the Environment for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Minor Works REF is considered to meet all relevant requirements.

## 6.3 Environment staff recommendation

It is recommended that the proposal to Brian Road Intersection Upgrade - Geotechnical Investigation as described in this Minor Works REF proceed subject to the implementation of all safeguards identified in the Minor Works REF and compliance with all other relevant statutory approvals, licences, permits and authorisations.

The Minor Works REF has examined and taken into account to the fullest extent possible all matters likely to affect the environment by reason of the activity and established that the activity is not likely to significantly affect the environment or threatened species, ecological communities or their habitats.

The Minor Works REF has concluded that there will be no significant impacts on matters of national environmental significance or any impacts on the environment of Commonwealth land.

The Minor Works REF determination will remain current for five years until August 2027 at which time it shall lapse if works have not been physically commenced. The pre-construction checklist must be completed prior to the commencement of any works.

**Recommended by:**  22/09/2022

Alana Watts

Transport Environment & Sustainability Manager]

Date:

**Noted by:** 

Yogaratnam Suthan

Project Manager

Date: 2022.09.14

## 6.4 Determination

In accordance with the above recommendation and sections 5.5 and 5.7 of the EP&A Act, I determine that Transport for NSW may:

- proceed with the activity
- 

Stephen Baker



Director, Program Manager

Date: 15/09/2022

## Appendix A

### Aboriginal Heritage Information Management Search (AHIMS) Tool and Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI)



28 June 2022

Kimberley Holliday  
Senior Environment and Sustainability Officer  
Western Parkland City  
Safety Environment & Regulation

Dear Kimberley

**Preliminary assessment results for the Appin Road Utility and Geotechnical Investigations for the Brian Road Roundabout and Fauna Underpass MWREF, based on Stage 1 of the Procedure for Aboriginal cultural heritage consultation and investigation (the procedure).**

The project, as described in the Stage 1 assessment checklist was assessed as being unlikely to have an impact on Aboriginal cultural heritage.

The assessment is based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did not indicate moderate to high concentrations of Aboriginal objects or places in the study area.
- The study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Roads and Maritime Services' procedure.
- The cultural heritage potential of the study area appears to be reduced due to past disturbance.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

If the scope of your project changes, you must contact the Aboriginal Engagement Section, Greater Sydney Region, and your regional environmental staff to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Roads and Maritime Services' *Unexpected Heritage Items Procedure*.

For further assistance in this matter and do not hesitate to contact me.

Yours sincerely

A grey rectangular box containing a handwritten signature in cursive script that reads 'M. Lester'.

Mark Lester  
Aboriginal Cultural Heritage Officer – Greater Sydney Region



WSP

Date: 23 June 2022

Level 27 680 George Street  
Sydney New South Wales 2000

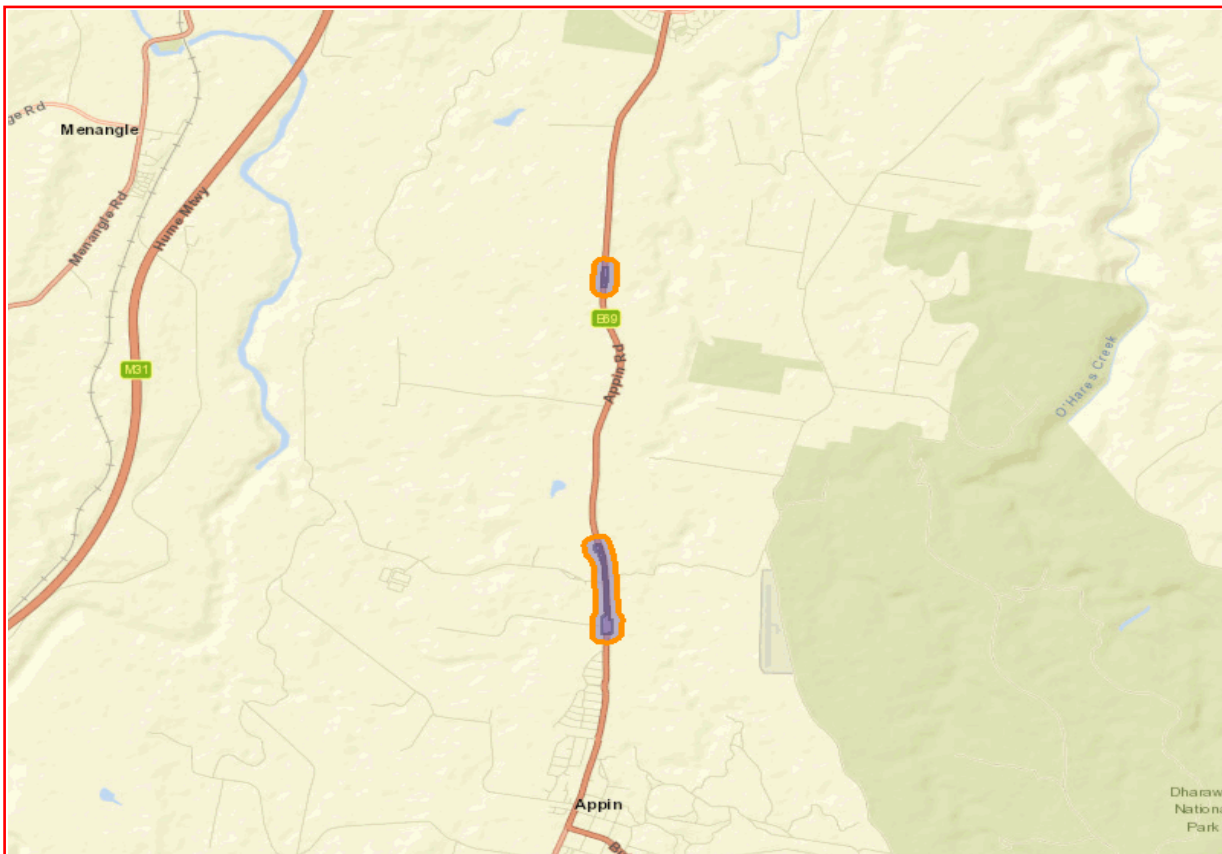
Attention: Annie Pinnock

Email: annie.pinnock@wsp.com

Dear Sir or Madam:

**AHIMS Web Service search for the following area at Search using shape-file MWREF v2/Project MWREF Boundary 220623 with a buffer of 0 meters. Additional Info : Due Diligence, conducted by Annie Pinnock on 23 June 2022.**

**The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.**



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

<b>0</b>	<b>Aboriginal sites are recorded in or near the above location.</b>
<b>0</b>	<b>Aboriginal places have been declared in or near the above location. *</b>

### **If your search shows Aboriginal sites or places what should you do?**

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(https://www.legislation.nsw.gov.au/gazette\)](https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

### **Important information about your AHIMS search**

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

# Appendix B

## Biodiversity Assessment Memo



## Memo

**To:** Jonathan Epselis  
**From:** Toby Lambert  
**Subject:** **Brian Road Intersection Upgrade – Geotechnical Works**  
**Our ref:** PS119368-ECO-MEM- RevF  
**Date:** 5 September 2022

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## 1. Introduction

### 1.1 Project description

Transport for NSW proposes to carry out utility and geotechnical investigations for the Brian Road Intersection Upgrade – Geotechnical Works to support the Appin Road Safety Improvements, between Appin and Gilead.

Key features of the proposal include:

- Buried services search.
- Traffic management.
- Geotechnical investigation including number and type of investigations, investigation locations and purpose, proposed depth, termination criteria and laboratory testing.
- Utility investigation.

The proposal is anticipated to involve the following work methodology:

- Buried services search.
- Investigation location set out.
- Investigation location survey.
- Traffic management.
- Environmental requirements.
- Access.
- Field supervision, logging, sampling and photography.
- Borehole investigation, including:
  - Soil zone drilling and sampling.
  - Rock coring.
  - Borehole completion details including cuttings placed back in the hole and compacted using a tamping rod to the surface level.
- Laboratory testing.

Appendix A provides a series of maps showing the proposed works.

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WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

### 1.1.1 Geotechnical investigations

Multiple phases of site investigation have been completed for the Appin Road Safety Improvement works between 2018 (Strategic Design Preliminary Site investigation by Aecom) and 2021 (Detailed Design Site investigation by WSP) (GIPP 2022). The objective of the proposed works is to provide additional data specifically related to the preparation of representative geological and geotechnical models for Detailed Design of the Brian Road Roundabout and Fauna Underpass which is currently absent.

The minimum geotechnical investigation requirements for detailed road design are outlined in the specification RMS PS331. There are two proposed geotechnical investigation locations. The proposed geotechnical investigations provide data that was not collected at the Strategic Design site investigation stage and are located at:

- BH01 – 275 Appin Rd, Appin NSW
- BH02 – 290 Appin Rd, Appin NSW

The locality of these bore holes are displayed in Photo 3.1 and Photo 3.2.

### 1.1.2 Utility site investigations

In conjunction with the 2 geotechnical investigations, it is proposed to undertake utility investigations, which will include up to 11 potholes and/or six slit trenches within the proposed works area to help inform the 100% detailed design. The exact combination of potholes or slit trenches will be dependent on constraints encountered. The works will also include numerous non-destructive traces with ground penetrating radar (GPR) (class b traces). The works will include locations along the proposed works study area for both Telstra fibre optics or copper cable and Sydney Water potable water. All vehicles are expected to remain within the carriageway with only pedestrian access on the verge. The proposed 11 pothole investigations are outlined as:

- Sydney Water potable water PE125 – eastern side of Appin Road at CH65.
- Telstra fibre optic – eastern side of Appin Road at CH60.
- Telstra fibre optic – eastern side of Appin Road at CH85.
- Telstra copper cable and potable water house connection - eastern side of Appin Road at CH90.
- Telstra fibre optic – eastern side of Appin Road at CH650.
- Telstra fibre optic – eastern side of Appin Road at CH690.
- Telstra fibre optic – eastern side of Appin Road at CH790.
- Telstra fibre optic – eastern side of Appin Road at CH860.
- Telstra fibre optic – eastern side of Appin Road at CH950.
- Telstra fibre optic – eastern side of Appin Road at Ch4260.
- Telstra fibre optic – eastern side of Appin Road at Ch4280.

The slit trenches would be located in the following locations:

- Telstra fibre optic – eastern side of Appin Road at CH 175.
- Telstra fibre optic – eastern side of Appin Road at CH 275.
- Telstra fibre optic – eastern side of Appin Road at CH 375.
- Telstra fibre optic – eastern side of Appin Road at CH 475.
- Telstra fibre optic – eastern side of Appin Road at CH 575.
- Telstra fibre optic – eastern side of Appin Road at CH 900.

The combination of potholes and slit trenches is included in the methodology to safeguard against constraints such as access approvals, limitation in equipment and topography limitations to safely park the vacuum truck. Six slit trenches (all approximately 6-7 m by 0.3 m) would be used to confirm the Telstra Fibre Optic is not located in the verge area and will only be implemented if the limitations on site do not enable the potholing strategy to proceed. Additionally, only certain locations may be implemented in lieu of the nearest pothole. Consequently, as it is not possible to determine exactly if the potholes, slit trenches or a combination of both will be utilised, we have assumed the worst case which all 11 potholes and all 6 slit trenches are required to provide the necessary information to finalise the detailed design.

## 2. Methods

A desktop review of the following databases was undertaken to ensure currency of information:

- NSW Bionet, Atlas of NSW Wildlife database search (10km radius) updated 25 May 2022.
- Commonwealth EPBC Act Protected Matters Search Tool (PMST) (0.5km radius) updated 25 May 2022.

A WSP Ecologist also conducted a site visit to the study area on the 18<sup>th</sup> of May 2022 to assess the locations of proposed geotechnical and utility investigations. The site inspection focused on verifying existing vegetation mapping and searching for threatened species in the specific areas proposed for geotechnical and utility investigations.

## 3. Existing environment

### 3.1 Vegetation

The site assessment showed that the locations of all test locations will avoid all existing juvenile or mature trees existing in the study area. However, due to the nature of the works there will be an impact to ground layer vegetation from the following three vegetation types:

- Exotic pasture vegetation (two potholes or one slit trench in exotic pasture vegetation).
- Cumberland Plain Woodland – moderate condition (seven potholes, five slit trenches and two bore holes in Cumberland Plain Woodland).
- Shale Sandstone Transition Forest – moderate/good condition (two potholes).

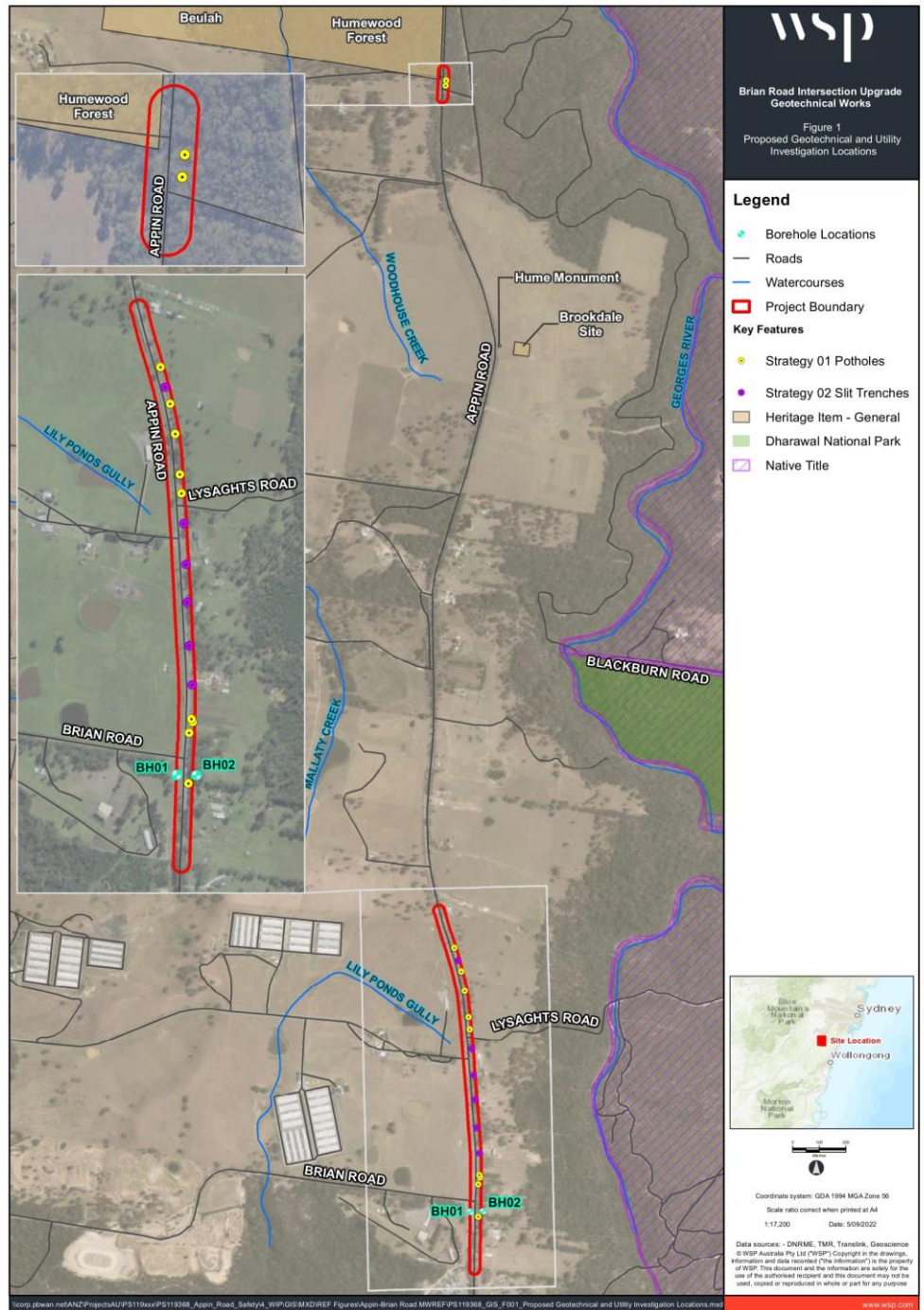
Cumberland Plain Woodland corresponds to Plant Community Type 849: Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion. Shale Sandstone Transition Forest corresponds to Plant Community Type 1395: Narrow-leaved Ironbark - Broad-leaved Ironbark - Grey Gum open forest of the edges of the Cumberland Plain, Sydney Basin Bioregion.

Of the proposed investigation work locations, only two are likely to involve the removal of native groundcovers or shrubs during the works. Although seven potholes, five slit trenches and two bore holes are in moderate condition Cumberland Plain Woodland, this classification is due to the presence of canopy species only. In these areas the mid-storey and under-storey vegetation was dominated by exotic vegetation. Overall, impacts to native vegetation are likely to be minimal given the dominance of weed species in the ground layer.

A photo of the locality of the two geotechnical bore holes and location of eight utility investigation pot holes are presented in photos 1-10 to show the condition of the vegetation where the works will take place. The remaining locations are in alignment with the potholes labelled as 2-7 in the photos below and all individual locations are presented in Figure 1.



Figure 1 Proposed Geotechnical and Utility Investigation locations







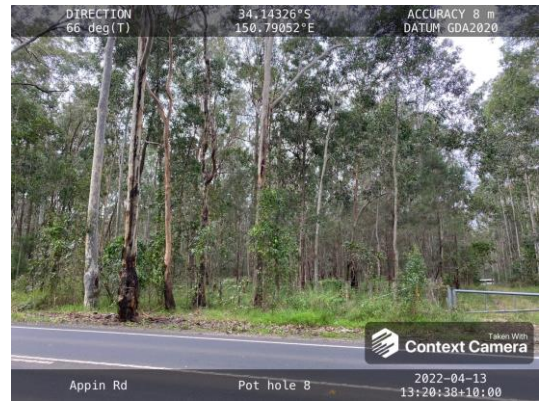
*Photo 3.1 Bore hole 1 – Cumberland Plain Woodland – moderate*



*Photo 3.2 Bore hole 2 – Cumberland Plain Woodland – moderate*



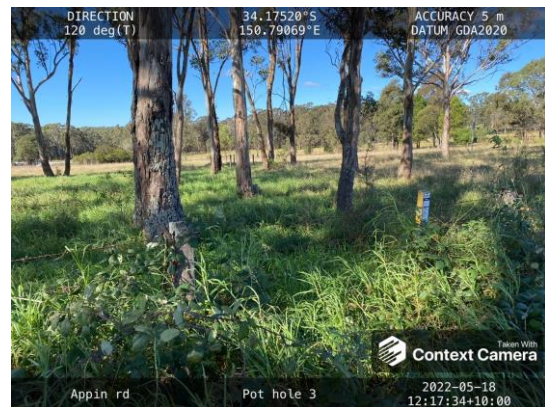
*Photo 3.3 Pot hole example 1 – Shale Sandstone Transition Forest – moderate/good*



*Photo 3.4 Pot hole example 8 – Shale Sandstone Transition Forest – moderate/good*



*Photo 3.5 Pot hole example 2 – Exotic vegetation bordering Cumberland Plain Woodland – moderate*



*Photo 3.6 Pot hole example 3 – Cumberland Plain Woodland – moderate*





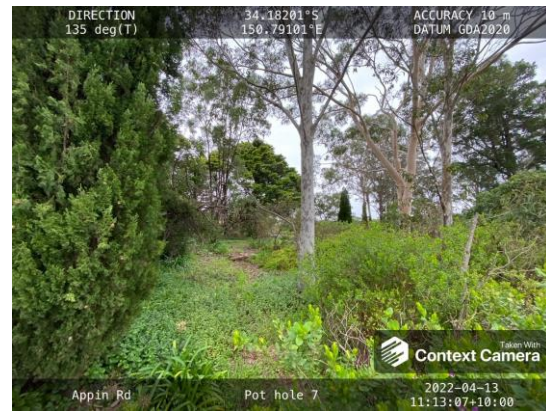
*Photo 3.7 Pot hole example 4 – Exotic vegetation beyond a patch of native Blady Grass*



*Photo 3.8 Pot hole example 5 – Cumberland Plain Woodland – moderate*



*Photo 3.9 Pot hole example 6 – Cumberland Plain Woodland – moderate*



*Photo 3.10 Pot hole example 7 – Cumberland Plain Woodland – moderate*

## 3.2 Threatened ecological communities

There are two BC Act listed TECs identified within the study area:

- Cumberland Plain Woodland in the Sydney Basin Bioregion (listed as a Critically Endangered Ecological Community).
- Shale Sandstone Transition Forest in the Sydney Basin Bioregion (listed as a Critically Endangered Ecological Community).

These TECs directly correspond to the vegetation types outlined above in Section 3.1.

## 3.3 Threatened flora species

Twenty-one BC Act listed threatened plant species and two endangered populations listed under the BC Act have been previously recorded in the locality based on the BioNet Atlas search (see Appendix A). During the current field survey no BC Act listed threatened plant species were recorded in the study area.

## 3.4 Threatened fauna species

Based on the BioNet Atlas search, 57 threatened fauna species listed under the BC Act have been previously identified in the locality (see Appendix B). This includes 18 mammals, 30 birds, four frogs, two reptiles and three invertebrates.

The study area is known to provide habitat for threatened animal species including the Koala and Little Lorikeet and is considered likely to provide habitat for a number of other threatened species including:

- Woodland Birds (Flame Robin, Dusky Woodswallow, Varied Sittella, Scarlet Robin, Hooded Robin, Speckled Warbler, Diamond Firetail, Gang-Gang Cockatoo, Glossy Black-cockatoo).
- Blossom Dependent Species (Regent Honeyeater, Black-chinned Honeyeater, Swift Parrot, Grey-headed Flying-fox).
- Large Forest Owls (Powerful Owl, Masked Owl, Barking Owl).
- Raptors (Little Eagle, Square-tailed Kite)
- Microchiropteran Bats (Greater Broad-nosed Bat, Eastern False Pipistrelle, Little Bent-wing Bat, Large Bent-wing Bat, Eastern Freetail Bat, Southern Myotis, Yellow-bellied Sheath-tail-bat, Large-eared Pied Bat).
- Gliders (Squirrel Glider, Yellow-bellied Glider).
- Spotted-tailed Quoll.
- Cumberland Plain Land Snail.
- Rosenberg's Goanna.

These species listed above are considered to have a moderate likelihood of occurrence.

While these threatened fauna species are either known to occur or are considered likely to occur in the habitat, the impact of the proposed geotechnical and utility investigation work on the habitat for these species will be negligible. The species with the most potential to be impacted is Cumberland Plain Land Snail as work will disturb the ground layer. However, Cumberland Plain Land Snail was not located in any of the proposed work areas during the site inspections.

### **3.5 Matters of National Environmental Significance**

#### **3.5.1 Nationally listed threatened ecological communities**

According to the Protected Matters Search Tool (PMST) 9 EPBC Act listed TECs are known to occur, likely to occur, or may occur in the locality. Of these 9 TECs, the study area contains vegetation corresponding to the following two EPBC Act listed TECs:

- Shale Sandstone Transition Forest of the Sydney Basin Bioregion
- Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest.

Within the study area, Cumberland Plain Woodland – moderate condition corresponds to the EPBC Act listed Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest TEC. The Shale Sandstone Transition Forest – moderate/good condition corresponds to the EPBC Act listed Shale Sandstone Transition Forest of the Sydney Basin Bioregion TEC.

#### **3.5.2 Threatened flora species**

Based on the results of the PMST search, 23 EPBC Act listed threatened plant species have the potential to occur within the search area (see Appendix C). During the current field survey no EPBC Act listed threatened plant species were recorded in the study area.

#### **3.5.3 Threatened fauna species**

Based on the results of the PMST search, 29 EPBC Act listed threatened animal species have the potential to occur within the search area including 12 birds, five frogs, nine mammals, two

reptiles and one invertebrate species (see Appendix C). Marine and wading bird species and fish have been excluded from assessment as there is no suitable habitat in the study area.

The following EPBC Act listed threatened fauna species are known to occur or are considered likely to occur based on the presence of suitable habitat:

- Gang-Gang Cockatoo
- Regent Honeyeater
- Swift Parrot
- White-throated Needletail
- Large-eared Pied Bat
- Grey-headed Flying-fox
- Koala
- Yellow-bellied Glider
- Spotted-tailed Quoll.

While these threatened fauna species are either known to occur or are considered likely to occur in the habitat, the impact of the proposed geotechnical and utility investigation work on the habitat for these species will be negligible as impacts are limited to small areas of ground layer which will not impact on the lifecycles of the EPBC Act listed fauna species listed above.

As discussed below in Section 3.5.4, the White-throated Needletail spends the non-breeding season in Australia and is primarily aerial. As such, this species may fly over the study area as part of normal movement patterns and this species not considered relevant to this assessment as no habitat for this species will be impacted directly or indirectly.

### 3.5.4 Migratory species

The results of the PMST indicate that 14 listed migratory species may occur in the locality. These species include a number of migratory wetland birds that do not have any habitat within or near the study area so have been excluded from the assessment.

Of the listed migratory species, the following are considered moderately likely to occur in, or fly over, the study area based on the presence of potentially suitable habitats:

- migratory marine birds – Fork-tailed Swift
- migratory terrestrial species – White-throated Needletail.

The Fork-tailed Swift and White-throated Needletail spend the non-breeding season in Australia and are primarily aerial. As such, they may fly over the study area as part of normal movement patterns and are not considered relevant to this assessment as no habitat for these species will be impacted directly or indirectly.

While some migratory species of bird are likely to use the study area and locality, the study area would not be classed as an ‘important habitat’. A nationally significant proportion of a population would not be supported by the habitats in the study area. The project would not substantially modify, destroy or isolate an area of important habitat for the migratory species, and it would not seriously disrupt the lifecycle of an ecologically significant proportion of a population of migratory birds.

## 4. Impact assessment

For this assessment, it is assumed that disturbances to vegetation would be limited to the disturbance/removal of groundcover and understorey vegetation only. It is assumed that no native overstorey vegetation (including hollow bearing trees) would be impacted by the

proposed works. Areas of impact have been calculated to accommodate a 5 square metre area of disturbance at each pothole within the study area, however the pothole will likely only take up to several 300mm diameter holes within this marked area. This total overall impact is likely between 0.3 to 0.9 m<sup>2</sup> per pot hole location, and between 1.8 to 2.1 m<sup>2</sup> per slit trench. Taking a conservative approach, the total considered impact for this assessment is approximately 5m<sup>2</sup> at each investigation work location (bore hole, pot hole, and slit trench) totalling 80 m<sup>2</sup>. This is an overestimate of the potential impact but is still regarded as negligible.

The predicted impacts on native ecological communities are as follows:

- Cumberland Plain Woodland – moderate condition: two bore holes, seven potholes, and five slit trenches equal to an impact of up to 70 m<sup>2</sup>
- Shale Sandstone Transition Forest – moderate/good condition: two potholes equal to an impact of up to 10 m<sup>2</sup>

Total impact to habitat for threatened fauna species is approximately 80 m<sup>2</sup>.

Where possible, the truck will remain within the carriageway. While the proposal involves some minor impacts and if required (for safety reasons) would include the vacuum truck may be parked on grassed surfaces (short-term) for some of the investigations, the potential for significant impacts on threatened species and ecological communities as a result of the proposal is considered low due to the minor nature of the works.

The proposed works would be assessed under Part 5 of the EP&A Act. Section 7.3 of the BC Act outlines the ‘test of significance’ that is to be undertaken to assess the likelihood of significant impact upon threatened species or ecological communities listed under the BC Act. The proportional impact on TECs and threatened species habitat is negligible when the local occurrence of the TEC and habitat extent is taken into account. The proposal is considered unlikely to significantly affect threatened species or ecological communities, or their habitats (see Appendix D).

For threatened biodiversity listed under the EPBC Act, significance assessments have been completed in accordance with the *EPBC Act Policy Statement 1.1 Significant Impact Guidelines* (Department of Environment, 2013). The proposal is considered unlikely to significantly impact threatened species or ecological communities (see Appendix E).

## 5. Safeguards

Safeguards to be implemented are:

- If unexpected threatened fauna or flora species are discovered, stop works immediately and follow the Unexpected Threatened Species Find Procedure in Guide 1 – Pre-clearing process of the Biodiversity Guidelines (Roads and Traffic Authority, 2011)
- Ensure any fauna encountered onsite would be managed in accordance with *Biodiversity Guidelines, Guide 9* (fauna handling) (Roads and Maritime, 2016)
- Prior to commencing works, engineers will conduct a toolbox talk regarding possible Cumberland Plain Land Snail habitat features that may be present within the locality of each investigation site (particularly the two pot holes located in Shale Sandstone Transition Forest). Ensuring that where possible works will be undertaken in open grass areas away from woody debris.
- No significant native vegetation or tree removal will be undertaken during proposed works. The drill rig will only be parked on grassed or disturbed areas and given the drill



rig height (with mast erected), treed areas will be avoided. Bore holes will create an impact of 300 mm in diameter and will be positioned in grassed or disturbed areas.

- No clearing of vegetation is to be undertaken for the purpose of access arrangements.

## 5.1 No net loss and offsets

For the purpose of the Transport Biodiversity Policy (Transport for NSW, 2022), projects will have achieved a no net loss where the expected loss from infrastructure development has been:

- Avoided to the extent reasonably practicable; and
- Mitigation measures, including measures to reduce habitat fragmentation effects, have been applied to the extent reasonably practicable; and
- Offsets have been provided through either credit purchase or BCF payment of the required number and type of biodiversity credits in accordance with the BAM or TfNSW guidelines; and/or
- Conservation measures have been delivered in accordance with the requirements of this policy and guidelines.

Through implementation of the safeguards identified above, the proposal will achieve a no net loss. Impacts to sensitive biodiversity values have been avoided to the extent reasonably practicable through placement of bore holes, pot holes and slit trenches in disturbed areas or in areas of exotic ground cover.

There are no fragmentation effects expected as the proposal will not result in the braking apart of blocks of habitat and no barriers to dispersal will be implemented.

This proposal is not legally obliged to participate in the NSW Biodiversity Offset Scheme as it is not State Significant Infrastructure (SSI), Critical State Significant Infrastructure (CSSI), and it will not have a significant impact on threatened species and threatened ecological communities or impact Areas of Outstanding Biodiversity Value.

The proposal potentially could be seen to trigger the Transport biodiversity offset thresholds as outlined in the Transport Biodiversity Policy (see Transport for NSW, 2022). This is due to the impact on the Critically Endangered ecological communities Cumberland Plain Woodland in the Sydney Basin Bioregion and Shale Sandstone Transition Forest in the Sydney Basin Bioregion.

However, the TfNSW biodiversity offset threshold exclusions (Transport for NSW, 2022) include “*Works within areas that are reasonably likely to naturally regenerate*”. It is considered that these small areas of proposed disturbance are likely to be able to naturally regenerate and as such biodiversity offsets should not be required.

## 6. Conclusion

While there will be an impact to TECs and threatened species habitat from the proposal, the impacts are considered to be negligible. Boreholes will create an impact of 300 mm in diameter and will be positioned in grassed or disturbed areas. This extent of impact is considered unlikely to result in a significant impact to any TEC or threatened species or their habitats. They should be able to regenerate naturally and therefore biodiversity offsets should not be required.

Yours Sincerely,



Toby Lambert  
Technical Executive - Ecology,  
Ecology Team Leader - NSW



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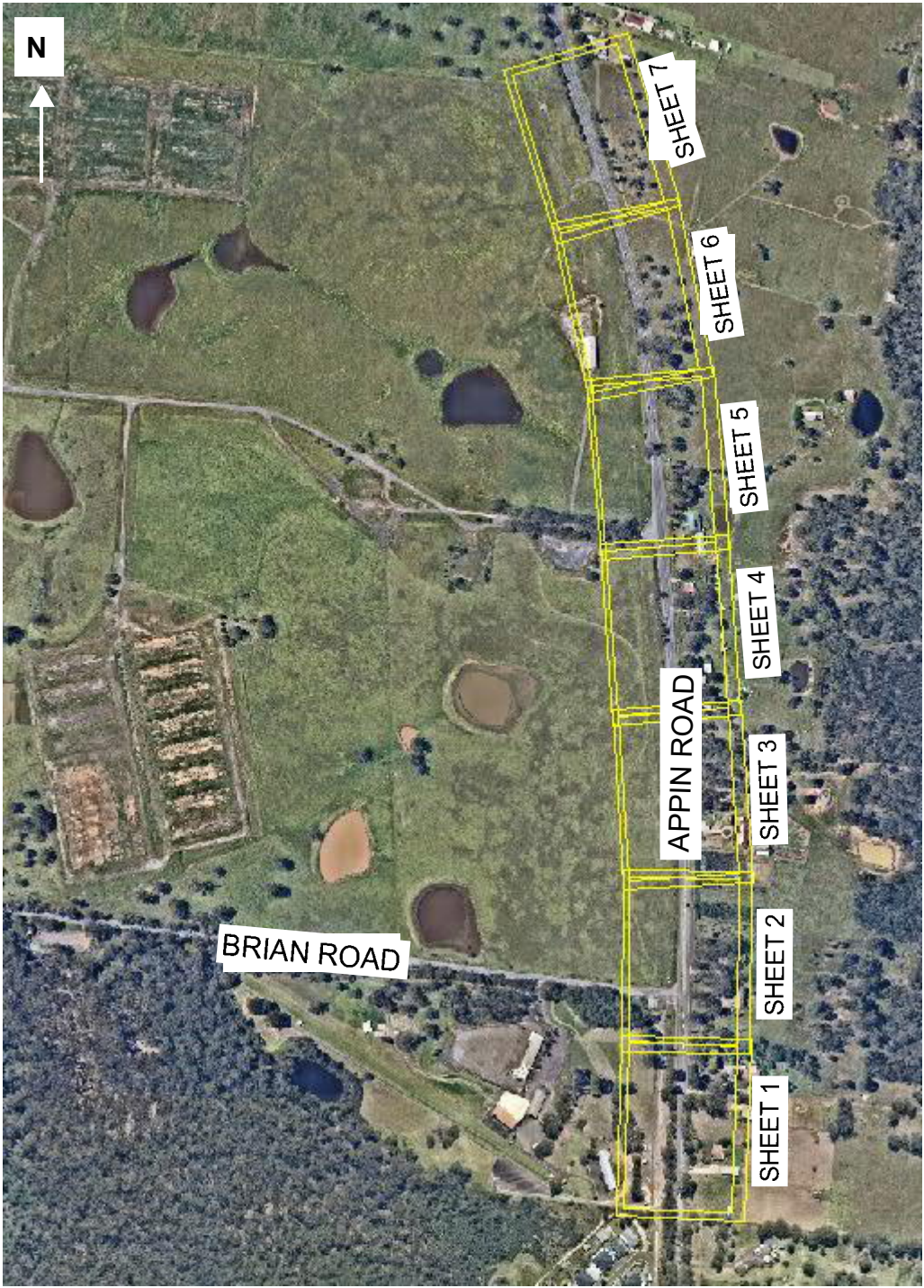
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## Appendix A Design sketches of proposed works



N



BRIAN ROAD

APPIN ROAD

SHEET 7

SHEET 6

SHEET 5

SHEET 4

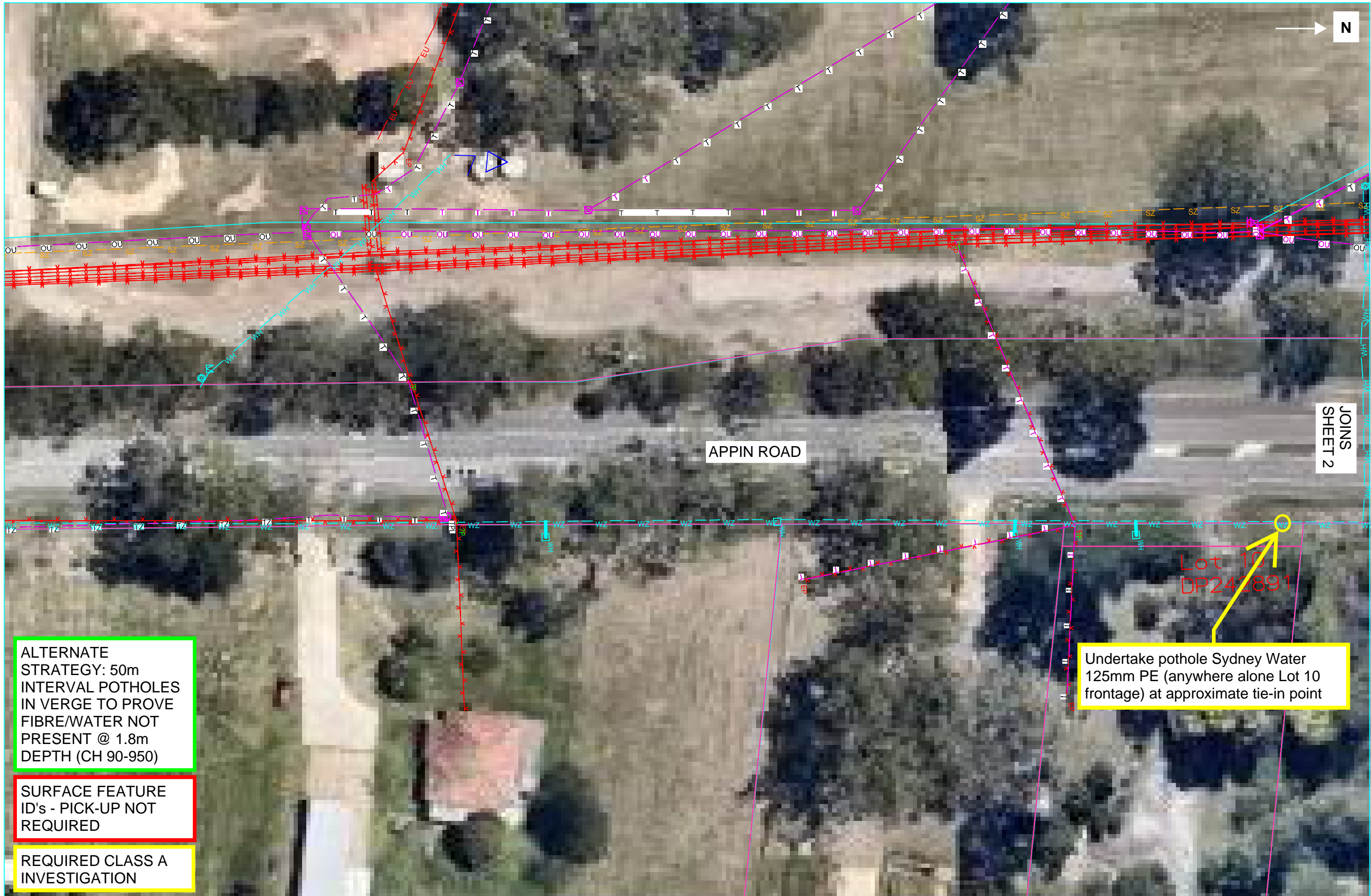
SHEET 3

SHEET 2

SHEET 1



THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED  
50mm ON A3 SIZE ORIGINAL



ALTERNATE STRATEGY: 50m INTERVAL POTHOLES IN VERGE TO PROVE FIBRE/WATER NOT PRESENT @ 1.8m DEPTH (CH 90-950)

SURFACE FEATURE ID's - PICK-UP NOT REQUIRED

REQUIRED CLASS A INVESTIGATION

Undertake pothole Sydney Water 125mm PE (anywhere along Lot 10 frontage) at approximate tie-in point

FOR INFORMATION ONLY

SCALE 1:500

PLOT DATE / TIME  
Fri Feb 25 12:50:50 2022

PLOT BY  
R.M

CLIENT



Transport  
Roads & Maritime  
Services

PREPARED FOR  
COMMENT

BRIAN ROAD INTERSECTION UPGRADE

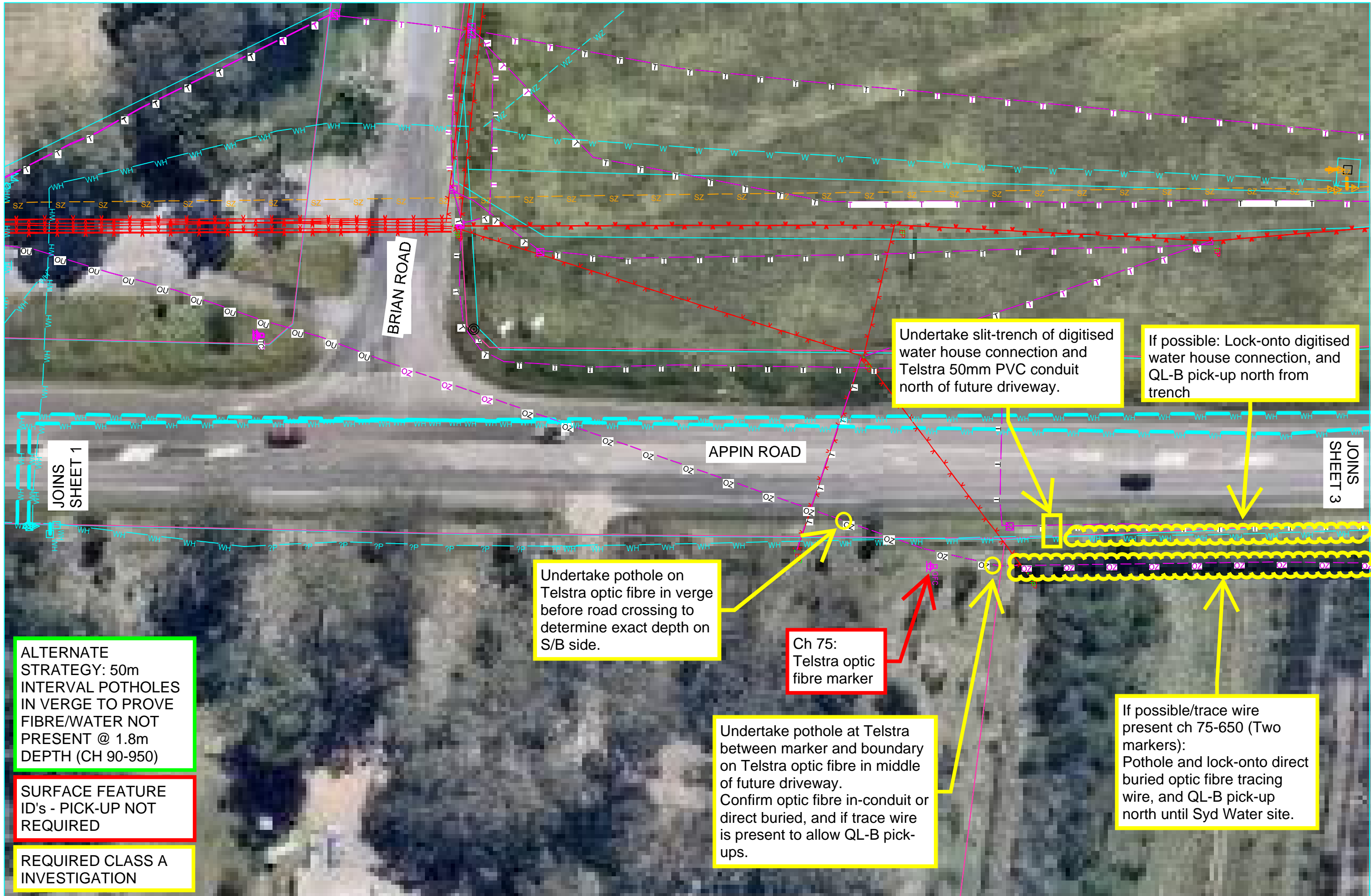
DESIGN SKETCHES  
REQUIRED UTILITIES SURVEY  
PLAN - T0

SHEET 1

A3



THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED  
50mm ON A3 SIZE ORIGINAL



ALTERNATE STRATEGY: 50m INTERVAL POTHOLES IN VERGE TO PROVE FIBRE/WATER NOT PRESENT @ 1.8m DEPTH (CH 90-950)

SURFACE FEATURE ID's - PICK-UP NOT REQUIRED

REQUIRED CLASS A INVESTIGATION

Undertake pothole on Telstra optic fibre in verge before road crossing to determine exact depth on S/B side.

Ch 75: Telstra optic fibre marker

Undertake pothole at Telstra between marker and boundary on Telstra optic fibre in middle of future driveway. Confirm optic fibre in-conduit or direct buried, and if trace wire is present to allow QL-B pick-ups.

Undertake slit-trench of digitised water house connection and Telstra 50mm PVC conduit north of future driveway.

If possible: Lock-onto digitised water house connection, and QL-B pick-up north from trench

If possible/trace wire present ch 75-650 (Two markers): Pothole and lock-onto direct buried optic fibre tracing wire, and QL-B pick-up north until Syd Water site.

FOR INFORMATION ONLY

SCALE 1:500

PLOT DATE / TIME  
Tue Apr 26 18:01:03 2022

PLOT BY  
R.M

CLIENT



Transport  
Roads & Maritime  
Services

PREPARED FOR  
COMMENT

BRIAN ROAD INTERSECTION UPGRADE

DESIGN SKETCHES  
REQUIRED UTILITIES SURVEY  
PLAN - TO

SHEET 2

A3

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50mm ON A3 SIZE ORIGINAL



ALTERNATE STRATEGY: 50m INTERVAL POTHOLES IN VERGE TO PROVE FIBRE/WATER NOT PRESENT @ 1.8m DEPTH (CH 90-950)

SURFACE FEATURE ID's - PICK-UP NOT REQUIRED

REQUIRED CLASS A INVESTIGATION

If possible: Lock-onto digitised water house connection, and QL-B pick-up north from trench

If possible/trace wire present ch 75-650 (Two markers): Pothole and lock-onto direct buried optic fibre tracing wire, and QL-B pick-up north until Syd Water site.

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PLAN - TO

SHEET 3

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APPIN ROAD

JOINS SHEET 3

JOINS SHEET 5

ALTERNATE STRATEGY: 50m INTERVAL POTHOLES IN VERGE TO PROVE FIBRE/WATER NOT PRESENT @ 1.8m DEPTH (CH 90-950)

SURFACE FEATURE ID's - PICK-UP NOT REQUIRED

REQUIRED CLASS A INVESTIGATION

If possible/trace wire present ch 75-650 (Two markers): Pothole and lock-onto direct buried optic fibre tracing wire, and QL-B pick-up north until Syd Water site.

LOT 1  
9234466

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SCALE 1:500

PLOT DATE / TIME  
Fri Feb 25 12:52:11 2022

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COMMENT

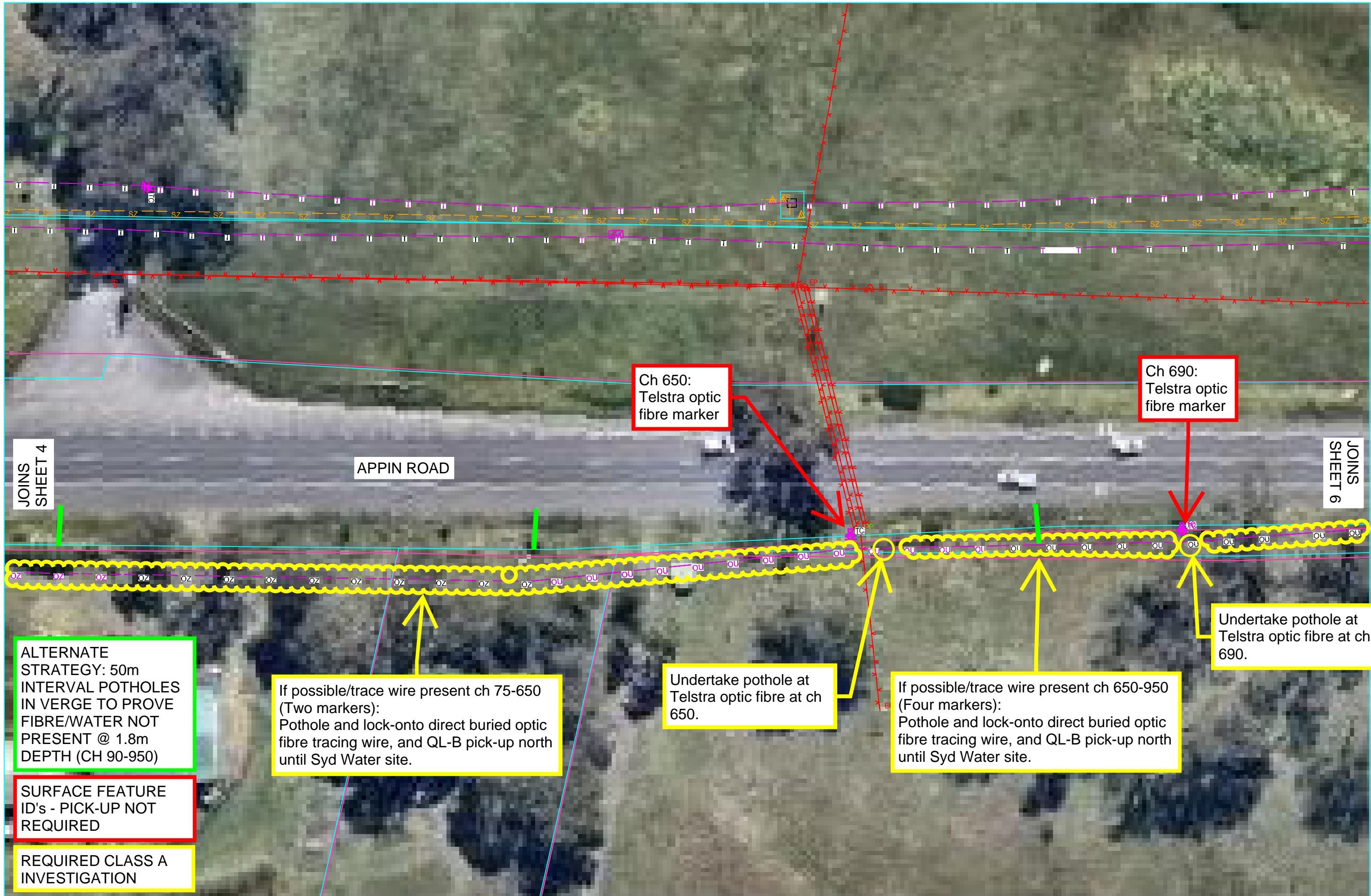
BRIAN ROAD INTERSECTION UPGRADE

DESIGN SKETCHES  
REQUIRED UTILITIES SURVEY  
PLAN - 10

SHEET 4

A3

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BRIAN ROAD INTERSECTION UPGRADE  
 DESIGN SKETCHES  
 REQUIRED UTILITIES SURVEY  
 PLAN - TO  
 SHEET 5  
 A3



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JOINS SHEET 5

JOINS SHEET 7

APPIN ROAD

Elec pole #PL777564

Ch 860: Telstra optic fibre marker

ALTERNATE STRATEGY: 50m INTERVAL POTHOLES IN VERGE TO PROVE FIBRE/WATER NOT PRESENT @ 1.8m DEPTH (CH 90-950)

SURFACE FEATURE ID's - PICK-UP NOT REQUIRED

REQUIRED CLASS A INVESTIGATION

If possible/trace wire present ch 650-950 (Four markers): Pothole and lock-onto direct buried optic fibre tracing wire, and QL-B pick-up north until Syd Water site.

Undertake pothole at Telstra optic fibre at ch 860.

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Fri Feb 25 12:53:13 2022

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BRIAN ROAD INTERSECTION UPGRADE

DESIGN SKETCHES  
REQUIRED UTILITIES SURVEY  
PLAN - TO

SHEET 6

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Fri Feb 25 13:37:36 2022

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REQUIRED UTILITIES SURVEY  
PLAN - TO

SHEET 7

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**SURFACE FEATURE ID's - PICK-UP NOT REQUIRED**

**REQUIRED CLASS A INVESTIGATION**

**FOR INFORMATION ONLY**

SCALE 1:1000

PLOT DATE / TIME  
Wed Apr 27 09:24:11 2022

PLOT BY  
R.M

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BRIAN ROAD INTERSECTION UPGRADE

DESIGN SKETCHES  
REQUIRED UTILITIES SURVEY  
BEULAH RESERVE - TO

SHEET 1

A3



## Appendix B BioNet Atlas search results

Table B.1 BioNet Atlas search results clipped to 10km of the study area

Species name	Common name	Number of records
<b>Fauna</b>		
<b>Amphibia</b>		
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	28
<i>Litoria aurea</i>	Green and Golden Bell Frog	3
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	38
<i>Pseudophryne australis</i>	Red-crowned Toadlet	61
<b>Aves</b>		
<i>Anthochaera phrygia</i>	Regent Honeyeater	4
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	149
<i>Burhinus grallarius</i>	Bush Stone-curlew	2
<i>Calidris canutus</i>	Red Knot	8
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	85
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	23
<i>Chthonicola sagittata</i>	Speckled Warbler	3
<i>Circus assimilis</i>	Spotted Harrier	1
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	6
<i>Daphoenositta chrysoptera</i>	Varied Sittella	97
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	1
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	1
<i>Falco subniger</i>	Black Falcon	1
<i>Glossopsitta pusilla</i>	Little Lorikeet	105
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	18
<i>Hieraaetus morphnoides</i>	Little Eagle	27
<i>Hirundapus caudacutus</i>	White-throated Needletail	10
<i>Lathamus discolor</i>	Swift Parrot	125
<i>Lophoictinia isura</i>	Square-tailed Kite	13
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	1
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	1
<i>Neophema pulchella</i>	Turquoise Parrot	2

Species name	Common name	Number of records
<i>Ninox connivens</i>	Barking Owl	1
<i>Ninox strenua</i>	Powerful Owl	54
<i>Petroica boodang</i>	Scarlet Robin	35
<i>Petroica phoenicea</i>	Flame Robin	3
<i>Pezoporus wallicus wallicus</i>	Eastern Ground Parrot	1
<i>Stagonopleura guttata</i>	Diamond Firetail	7
<i>Stictonetta naevosa</i>	Freckled Duck	1
<i>Tyto novaehollandiae</i>	Masked Owl	3
<b>Gastropoda</b>		
<i>Meridolum corneovirens</i>	Cumberland Plain Land Snail	151
<i>Pommerhelix duralensis</i>	Dural Land Snail	1
<b>Insecta</b>		
<i>Petalura gigantea</i>	Giant Dragonfly	2
<b>Mammalia</b>		
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	47
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	16
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	7
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	22
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	7
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	43
<i>Miniopterus australis</i>	Little Bent-winged Bat	15
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	56
<i>Myotis macropus</i>	Southern Myotis	221
<i>Petauroides volans</i>	Greater Glider	5
<i>Petaurus australis</i>	Yellow-bellied Glider	4
<i>Petaurus norfolcensis</i>	Squirrel Glider	7
<i>Phascolarctos cinereus</i>	Koala	2771
<i>Phoniscus papuensis</i>	Golden-tipped Bat	2
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	2
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	168
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	9

Species name	Common name	Number of records
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	36
<b>Reptilia</b>		
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	80
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	44
<b>Flora</b>		
<i>Acacia bynoeana</i>	Bynoe's Wattle	102
<i>Acacia pubescens</i>	Downy Wattle	1
<i>Cynanchum elegans</i>	White-flowered Wax Plant	1
<i>Eucalyptus benthamii</i>	Camden White Gum	1
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	1
<i>Galium australe</i>	Tangled Bedstraw	1
<i>Genoplesium baueri</i>	Bauer's Midge Orchid	2
<i>Grammitis stenophylla</i>	Narrow-leaf Finger Fern	1
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flower Grevillea	422
<i>Leucopogon exolasius</i>	Woronora Beard-heath	46
<i>Melaleuca deanei</i>	Deane's Paperbark	82
<i>Persoonia bargoensis</i>	Bargo Geebung	64
<i>Persoonia hirsuta</i>	Hairy Geebung	87
<i>Pimelea spicata</i>	Spiked Rice-flower	36
<i>Pomaderris adnata</i>	Sublime Point Pomaderris	1
<i>Pomaderris brunnea</i>	Brown Pomaderris	53
<i>Pterostylis saxicola</i>	Sydney Plains Greenhood	35
<i>Pultenaea aristata</i>	Prickly Bush-pea	137
<i>Pultenaea pedunculata</i>	Matted Bush-pea	9
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	4
<i>Thesium australe</i>	Austral Toadflax	1

## Appendix C EPBC Act PMST results

Table C.1 EPBC Act PMST results

Scientific Name	Common Name	Class	Presence
<i>Lathamus discolor</i>	Swift Parrot	Bird	Likely
<i>Calidris ferruginea</i>	Curlew Sandpiper	Bird	May
<i>Numenius madagascariensis</i>	Eastern Curlew, Far Eastern Curlew	Bird	May
<i>Anthochaera phrygia</i>	Regent Honeyeater	Bird	Likely
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Bird	Likely
<i>Rostratula australis</i>	Australian Painted Snipe	Bird	Likely
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Bird	Known
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	Bird	May
<i>Hirundapus caudacutus</i>	White-throated Needletail	Bird	Known
<i>Falco hypoleucos</i>	Grey Falcon	Bird	Likely
<i>Pycnoptilus floccosus</i>	Pilotbird	Bird	Likely
<i>Grantiella picta</i>	Painted Honeyeater	Bird	Likely
<i>Macquaria australasica</i>	Macquarie Perch	Fish	Known
<i>Litoria watsoni</i>	Watson's Tree Frog	Frog	May
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog, Heath Frog	Frog	Likely
<i>Litoria aurea</i>	Green and Golden Bell Frog	Frog	May
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	Frog	Likely
<i>Mixophyes balbus</i>	Stuttering Frog, Southern Barred Frog (in Victoria)	Frog	May
<i>Austrocordulia leonardi</i>	Sydney Hawk Dragonfly	Insect	May
<i>Dasyurus maculatus maculatus</i> (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Mammal	Known
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern)	Mammal	May
<i>Phascolarctos cinereus</i> (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Mammal	Known
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat, Large Pied Bat	Mammal	Known
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Mammal	Known

Scientific Name	Common Name	Class	Presence
<i>Petaurus australis australis</i>	Yellow-bellied Glider (south-eastern)	Mammal	Likely
<i>Petauroides volans</i>	Greater Glider	Mammal	Likely
<i>Pseudomys novaehollandiae</i>	New Holland Mouse, Pookila	Mammal	Likely
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	Mammal	Likely
<i>Thelymitra kangaloonica</i>	Kangaloon Sun Orchid	Plant	May
<i>Rhodamnia rubescens</i>	Scrub Turpentine, Brown Malletwood	Plant	Likely
<i>Persoonia hirsuta</i>	Hairy Geebung, Hairy Persoonia	Plant	Known
<i>Pomaderris cotoneaster</i>	Cotoneaster Pomaderris	Plant	May
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	Plant	May
<i>Pimelea spicata</i>	Spiked Rice-flower	Plant	Likely
<i>Persoonia nutans</i>	Nodding Geebung	Plant	May
<i>Genoplesium baueri</i>	Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid	Plant	Likely
<i>Allocasuarina glareicola</i>	null	Plant	May
<i>Pterostylis saxicola</i>	Sydney Plains Greenhood	Plant	Likely
<i>Cynanchum elegans</i>	White-flowered Wax Plant	Plant	Likely
<i>Haloragis exalata subsp. exalata</i>	Wingless Raspwort, Square Raspwort	Plant	May
<i>Pultenaea aristata</i>	null	Plant	Likely
<i>Acacia bynoeana</i>	Bynoe's Wattle, Tiny Wattle	Plant	Known
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry	Plant	May
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	Plant	May
<i>Melaleuca deanei</i>	Deane's Melaleuca	Plant	Likely
<i>Grevillea parviflora subsp. parviflora</i>	Small-flower Grevillea	Plant	Likely
<i>Thesium australe</i>	Austral Toadflax, Toadflax	Plant	May
<i>Pomaderris brunnea</i>	Rufous Pomaderris, Brown Pomaderris	Plant	Known
<i>Persoonia bargoensis</i>	Bargo Geebung	Plant	May
<i>Caladenia tessellata</i>	Thick-lipped Spider-orchid, Daddy Long-legs	Plant	May



<b>Scientific Name</b>	<b>Common Name</b>	<b>Class</b>	<b>Presence</b>
<i>Persicaria elatior</i>	Knotweed, Tall Knotweed	Plant	Likely
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	Reptile	Likely
<i>Delma impar</i>	Striped Legless Lizard, Striped Snake-lizard	Reptile	May

## Appendix D Assessments of significance – BC Act

The proposed works would be assessed under Part 5 of the EP&A Act. Section 7.3 of the BC Act outlines the ‘test of significance’ that is to be undertaken to assess the likelihood of significant impact upon threatened species or ecological communities listed under the BC Act. An assessment of significance has been completed for the following TECs listed under the BC Act:

- Shale Sandstone Transition Forest in the Sydney Basin Bioregion.
- Cumberland Plain Woodland in the Sydney Basin Bioregion.

An assessment of significance has been completed for the following threatened fauna species listed under the BC Act:

- Woodland Birds (Flame Robin, Dusky Woodswallow, Varied Sittella, Scarlet Robin, Hooded Robin, Speckled Warbler, Diamond Firetail, Gang-Gang Cockatoo, Glossy Black-cockatoo).
- Blossom Dependent Species (Little Lorikeet, Regent Honeyeater, Black-chinned Honeyeater, Swift Parrot, Grey-headed Flying-fox).
- Large Forest Owls (Powerful Owl, Masked Owl, Barking Owl).
- Raptors (Little Eagle, Square-tailed Kite)
- Microchiropteran Bats (Greater Broad-nosed Bat, Eastern False Pipistrelle, Little Bent-wing Bat, Large Bent-wing Bat, Eastern Freetail Bat, Southern Myotis, Yellow-bellied Sheath-tail-bat, Large-eared Pied Bat).
- Koala
- Gliders (Squirrel Glider, Yellow-bellied Glider)
- Spotted-tailed Quoll
- Cumberland Plain Land Snail
- Rosenberg’s Goanna.

### D.1 Threatened ecological communities

This assessment of significance has been completed for the following TECs listed under the BC Act:

- Shale Sandstone Transition Forest in the Sydney Basin Bioregion.
- Cumberland Plain Woodland in the Sydney Basin Bioregion.

The predicted impacts are as follows:

- Shale Sandstone Transition Forest in the Sydney Basin Bioregion: two potholes equal to an impact of 10 m<sup>2</sup>
- Cumberland Plain Woodland in the Sydney Basin Bioregion: nine bore holes /potholes equal to an impact of 70 m<sup>2</sup>.

Due to the minor impact to these TECs they have been assessed together.

The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats —

- (a) **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**

Not applicable.



- (b) 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.**

The local occurrence of Shale Sandstone Transition Forest in the Sydney Basin Bioregion and Cumberland Plain Woodland in the Sydney Basin Bioregion has been calculated based on the mapping in the *Remnant Vegetation of the western Cumberland subregion, 2013 Update* (VIS\_ID 4207) (State Government of NSW and Department of Planning, Industry and Environment 2015) and the *Native Vegetation of the Sydney Metropolitan Area - Version 3.1* (VIS\_ID 4489) (State Government of NSW and Department of Planning, Industry and Environment, 2016). The local occurrence of each TEC is outlined in Table C.1. The proportional impact to TECs from the proposal is small and is calculated based on the extent of each TEC mapped within 10km of the study area. The proportional impacts to the local occurrence of the TECs would not place the TECs at risk of extinction.

*Table D.1 Proportional impact to the local occurrence of TECs*

<b>Threatened ecological community</b>	<b>Local occurrence*</b>	<b>Predicted impact</b>	<b>Proportional impact</b>
Shale Sandstone Transition Forest in the Sydney Basin Bioregion	3512.80 ha	10 m <sup>2</sup>	<0.01 %
Cumberland Plain Woodland in the Sydney Basin Bioregion	1498.88 ha	70 m <sup>2</sup>	<0.01 %

Note: \* = Local occurrence of TECs estimated from regional scale mapping projects.

The proposal is considered unlikely to substantially and adversely modify the composition of the TECs such that the local occurrence is placed at risk of extinction. The local occurrence of the TECs has already been substantially and adversely modified by past land use practices. The ground layer to be impacted is largely disturbed and impacted by weeds. The limited disturbance from the proposal is not considered likely to further modify the composition of the TECs such that the local occurrence of is placed at risk of extinction. The current composition of the TECs within the locality is predicted to remain as is after the work is complete.

- (c) 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 predicted impacts are as follows:

- Shale Sandstone Transition Forest in the Sydney Basin Bioregion: two potholes equal to an impact of 10 m<sup>2</sup>
- Cumberland Plain Woodland in the Sydney Basin Bioregion: twelve bore holes /potholes equal to an impact of 70 m<sup>2</sup>.

Fragmentation is unlikely to occur from the proposal. Importantly, the proposal would not result in the breaking apart of large blocks of high-quality examples of threatened ecological communities into many smaller blocks. No further habitat fragmentation on a landscape scale would occur because of the proposal. Isolation of habitats is unlikely to increase as the proposal will not entirely remove patches from the landscape.

Due to the conservation significance of these two TECs, all remaining patches within NSW are likely to be important for their survival. The patches impacted by the proposal are however very small disturbed roadside examples and the roadside itself is not important to the long-term survival of the TECs in the locality.

**(d) 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 proposal will not impact on any declared area of outstanding biodiversity value.

**(e) 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.**

A Key Threatening Process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, population or ecological community. Key threatening processes are listed under the BC Act and at the present there are currently 38 listed KTPs. Of the 38 listed KTPs under the BC Act, eight are applicable to the TECs (see Table D.2). However, hygiene and weed control measures would reduce or avoid the impact of most KTPs with the exception of clearing of native vegetation.

*Table D.2 Key threatening processes and relevance to the proposal*

Key threatening process	Relevance to the proposal
Clearing of native vegetation.	Yes. The proposal would result in clearing of native vegetation.
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis.	Yes. The proposal may result in the introduction or spread of amphibian chytrid. However, hygiene measures would be followed to prevent spread of this fungus.
Infection of native plants by <i>Phytophthora cinnamomi</i>	Yes. The proposal may result in the introduction or spread of <i>Phytophthora cinnamomi</i> . However, hygiene measures would be followed to prevent spread of <i>Phytophthora cinnamomi</i> .
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.	Yes. The proposal may result in the introduction or spread of Exotic Rust Fungi. However, hygiene measures would be followed to prevent spread of Exotic Rust Fungi.
Invasion and establishment of exotic vines and scramblers.	Yes. The proposal may result in the invasion and establishment of exotic vines and scramblers. However, weed control measures would be followed to prevent invasion and establishment of exotic vines and scramblers.

Key threatening process	Relevance to the proposal
Invasion of native plant communities by African Olive <i>Olea europaea</i> L. subsp. <i>cuspidata</i>	Yes. The proposal may result in the invasion and establishment of African Olive <i>Olea europaea</i> L. subsp. <i>cuspidata</i> . However, weed control measures would be followed to prevent invasion and establishment of African Olive <i>Olea europaea</i> L. subsp. <i>Cuspidata</i> .
Invasion, establishment and spread of <i>Lantana camara</i>	Yes. The proposal may result in the invasion and establishment of <i>Lantana camara</i> . However, weed control measures would be followed to prevent invasion and establishment of <i>Lantana camara</i> .
Invasion of native plant communities by exotic perennial grasses	Yes. The proposal may result in the invasion and establishment of exotic perennial grasses. However, weed control measures would be followed to prevent invasion and establishment of exotic perennial grasses.

### Conclusion

In summary, the proposal is considered unlikely to have an adverse effect on the extent of the TECs such that the local occurrence of each is likely to be placed at further risk of extinction. The extent of impacts is negligible and the proposal is considered unlikely to substantially and adversely modify the composition of the TECs. There is unlikely to be any further increase in fragmentation from the proposal. The habitat to be impacted is not likely to be important to the long-term survival of the TECs in the locality. The proposal will however contribute to a KTP but the intensity of the potential impacts is very low.

An overall conclusion has been made that the proposal is unlikely to result in a significant effect to Shale Sandstone Transition Forest in the Sydney Basin Bioregion or Cumberland Plain Woodland in the Sydney Basin Bioregion.

## D.2 Threatened fauna species

Due to the negligible impact to fauna habitat predicted from the proposal and the fact that all species that have been assessed use the same habitat type, all fauna species have been assessed together here. This assessment of significance has been completed for the following threatened fauna species listed under the BC Act:

- Woodland Birds (Flame Robin, Dusky Woodswallow, Varied Sittella, Scarlet Robin, Hooded Robin, Speckled Warbler, Diamond Firetail, Gang-Gang Cockatoo, Glossy Black-cockatoo).
- Blossom Dependent Species (Little Lorikeet, Regent Honeyeater, Black-chinned Honeyeater, Swift Parrot, Grey-headed Flying-fox).
- Large Forest Owls (Powerful Owl, Masked Owl, Barking Owl).
- Raptors (Little Eagle, Square-tailed Kite)
- Microchiropteran Bats (Greater Broad-nosed Bat, Eastern False Pipistrelle, Little Bent-wing Bat, Large Bent-wing Bat, Eastern Freetail Bat, Southern Myotis, Yellow-bellied Sheath-tail-bat, Large-eared Pied Bat).
- Koala
- Gliders (Squirrel Glider, Yellow-bellied Glider)
- Spotted-tailed Quoll
- Cumberland Plain Land Snail
- Rosenberg's Goanna.

These species have been assessed as works would occur in a broad area of habitat that is known to be suitable or may be suitable for these species. The species that has the greatest possibility of being impacted by the proposal is the Cumberland Plain Land Snail. However, this species was not located at any of the proposed bore hole sites during the site inspection and pre-clearing surveys implemented as part of the proposal safeguards will ensure that this species is not detrimentally impacted by the proposal.

The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats —

**(a) 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 key assessment here is risk of extinction of a viable local population. Viability refers to the capacity to successfully complete each stage of the life cycle under normal conditions (State of NSW and Office of Environment and Heritage, 2018). A viable population of *Acacia pubescens* is one which is capable of being self-sustaining in the medium to long term. Demonstrating that a population is not viable would require considerable time, effort and study and therefore any known or presumed local population should be assumed viable unless the contrary can be conclusively demonstrated through analysis of local ecological information, records, references and knowledge of species' behaviour and habitat, or through a comprehensive on-site ecological study (State of NSW and Office of Environment and Heritage, 2018). The populations of threatened species subject to this assessment are assumed to be viable.

The 'local population' is defined as the population that occurs in the study area and may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area (State of NSW and Office of Environment and Heritage, 2018). The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area (State of NSW and Office of Environment and Heritage, 2018). The roadside habitats in the study area are connected to larger blocks of habitat along the Georges River to the east and Nepean River to the west. The local populations of threatened fauna species are not limited to the habitat within the study area. The study area would form a very small part of the habitat for local fauna populations.

Breeding habitat for most of the threatened fauna species subject to this assessment is not present in the study area. Cumberland Plain Land Snail may potentially breed in the habitat as this is a small and relatively sedentary species but it was not found during the site inspection so the likelihood of breeding habitat for this species being present is low. Access to foraging resources plays a large role in the life cycle of fauna species but the habitats to be impacted are not part of an important foraging ground and do not provide any limiting foraging resources. As trees will not be impacted, foraging resources for most species will not be impacted.

The total impact to habitat for threatened fauna species is estimated at approximately 80 m<sup>2</sup>. This extent of impact will not reduce foraging or breeding habitats and is therefore unlikely to have an adverse effect on the life cycle of a species such that a viable local population of the species is likely to be placed at risk of extinction.

- (b) **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.

- (c) **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 total impact to habitat for threatened fauna species is estimated at approximately 80 m<sup>2</sup>. The impact is limited to the ground layer.

Fragmentation is unlikely to occur from the proposal. Importantly, the proposal would not result in the breaking apart of large blocks of high-quality examples of threatened species habitats into many smaller blocks. The impact is limited to the road side and no further habitat fragmentation on a landscape scale would occur because of the proposal. Isolation of habitats is unlikely to increase as the proposal will not reduce the number of habitat patches from the landscape or increase the distance between habitat patches.

Due to the conservation significance of these threatened species, all of the larger and higher quality habitat patches within NSW are likely to be important for the survival of these species. The patches impacted by the proposal are small disturbed roadside examples and the roadside itself is not important to the long-term survival of these species in the locality.

- (d) **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 proposal will not impact on any declared area of outstanding biodiversity value.

- (e) **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.**

A KTP is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, population or ecological community. Key threatening processes are listed under the BC Act and at the present there are currently 38 listed KTPs. Of the 38 listed KTPs under the BC Act, eight are applicable to this assessment. However, hygiene and weed control measures would reduce or avoid the impact of most KTPs with the exception of clearing of native vegetation.

### **Conclusion**

Impacts to habitat for these threatened fauna species are expected to be negligible. The impacts are limited to removal of a small area of ground layer of approximately 100 m<sup>2</sup> at each bore hole location. No breeding habitat for any species would be impacted. No foraging resources would be removed and the availability of foraging resources in the locality will not be reduced by the proposal. No fragmentation or isolation would occur due to the limited



impacts of the proposal. The roadside habitats that would be impacted are not as important as the adjacent larger core areas of habitat in the locality.

After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant effect to any threatened fauna species.



## Appendix E Assessments of significance – EPBC Act

For threatened biodiversity listed under the EPBC Act, significance assessments have been completed in accordance with the *EPBC Act Policy Statement 1.1 Significant Impact Guidelines* (Department of Environment, 2013). These significance assessments have been prepared for the following TECs and threatened species:

- Threatened Ecological Communities:
  - Shale Sandstone Transition Forest of the Sydney Basin Bioregion
  - Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest.
- Critically Endangered and Endangered species:
  - Gang-Gang Cockatoo
  - Regent Honeyeater
  - Swift Parrot
  - Koala
  - Spotted-tailed Quoll.
- Vulnerable species
  - White-throated Needletail
  - Large-eared Pied Bat
  - Grey-headed Flying-fox
  - Yellow-bellied Glider.

### E.1 Threatened ecological communities

An action is likely to have a significant impact on a Critically Endangered or Endangered ecological community if there is a real chance or possibility that it will:

#### 1. Reduce the extent of an ecological community

The predicted impacts to TECs are as follows:

- Shale Sandstone Transition Forest of the Sydney Basin Bioregion: two potholes equal to an impact of 10 m<sup>2</sup>
- Cumberland Plain Woodland in the Sydney Basin Bioregion: nine bore holes /potholes equal to an impact of 70 m<sup>2</sup>.

The local occurrence of Shale Sandstone Transition Forest of the Sydney Basin Bioregion and Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest has been calculated based on the mapping in the *Remnant Vegetation of the western Cumberland subregion, 2013 Update* (VIS\_ID 4207) (State Government of NSW and Department of Planning, Industry and Environment 2015) and the *Native Vegetation of the Sydney Metropolitan Area - Version 3.1* (VIS\_ID 4489) (State Government of NSW and Department of Planning, Industry and Environment, 2016). The local occurrence of each TEC is outlined in Table D.2. The proportional impact to TECs from the proposal is small and is calculated based on the extent of each TEC mapped within 10km of the study area. As such the proportional impacts to the local occurrence of the TECs would reduce the extent of the TECs less than 0.01% and would not be considered significant.

**Table E.1 Proportional impact to the local occurrence of TECs**

<b>Threatened ecological community</b>	<b>Local occurrence*</b>	<b>Predicted impact</b>	<b>Proportional impact</b>
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	3512.80 ha	10 m <sup>2</sup>	<0.01 %
Cumberland Plain Woodland and Shale-Gravel Transition Forest	1498.88 ha	70 m <sup>2</sup>	<0.01 %

Note: \* = Local occurrence of TECs estimated from regional scale mapping projects.

**2. Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines**

Fragmentation is unlikely to occur from the proposal. Importantly, the proposal would not result in the breaking apart of large blocks of high-quality examples of threatened ecological communities into many smaller blocks. No further habitat fragmentation on a landscape scale would occur because of the proposal. Isolation of habitats is unlikely to increase as the proposal will not entirely remove patches from the landscape.

**3. Adversely affect habitat critical to the survival of an ecological community**

The predicted impacts to TECs are as follows:

- Shale Sandstone Transition Forest of the Sydney Basin Bioregion: two potholes equal to an impact of 10 m<sup>2</sup>
- Cumberland Plain Woodland in the Sydney Basin Bioregion: nine bore holes /potholes equal to an impact of 70 m<sup>2</sup>.

The habitat to be impacted is disturbed roadside which is not critical to the survival of these TECs. No large-scale removal of high-quality TEC patches is proposed. As such, the proposal is considered unlikely to adversely affect habitat critical to the survival of the TECs.

**4. Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community’s survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns**

Where the TEC would be removed by the action, all abiotic factors (ie water, nutrients and soil) would be permanently modified and/or destroyed through vegetation removal.

**5. Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting**

Alteration of species composition in the TEC patches is considered unlikely to occur as they are already highly altered by weed invasion from past disturbance. Some functionally important species have already been lost and the proposal is not considered likely to cause any further substantial change in species composition.

- 6. Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:**
- a) assisting invasive species, that are harmful to the listed ecological community, to become established**
  - b) causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community**

Weed introduction and spread and the infection of native plants by *Phytophthora cinnamomi* have been identified as being spread by construction machinery. Phytophthora infects the roots of plants and has the potential to cause dieback. Machinery associated with vegetation clearance and subsequent construction for the proposal has the potential to introduce and transmit weed propagules and Phytophthora. This is a potential indirect impact through the spread and transmission of weeds and pathogens into retained habitat. This can be mitigated through the development and implementation of suitable control measures for vehicle and plant hygiene but an impact, particularly from weeds, is likely. It is the intention to use current best practice hygiene and weed control protocols.

Regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community is not proposed.

**7. Interfere with the recovery of an ecological community.**

There is no adopted or made Recovery Plan for these TECs.

The proposal will not interfere with any of the identified recovery actions in the *Approved Conservation Advice for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community* (Department of the Environment, Water, Heritage and the Arts, 2009).

The *Approved Conservation Advice (including listing advice) for Shale Sandstone Transition Forest of the Sydney Basin Bioregion* (Department of the Environment, 2014) identified the following two priority recovery actions that would be interfered with by the proposal:

- Avoid further clearance and fragmentation of patches of the ecological community and surrounding native vegetation, including derived grasslands/shrublands.
- Minimise impacts from any developments and activities adjacent to patches that might result in further degradation (for example by applying buffer zones).

However, the predicted impact to Shale Sandstone Transition Forest of the Sydney Basin Bioregion is one pot hole equal to an impact of 10 m<sup>2</sup>. This extent of impact is not notable in terms of intensity. It is a low magnitude impact that will have no significant effect on the recovery of the Shale Sandstone Transition Forest of the Sydney Basin Bioregion TEC.

**Conclusion**

After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant impact to the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest TEC or the Shale Sandstone Transition Forest of the Sydney Basin Bioregion TEC. The predicted impacts to these TECs are minor. A referral to the Commonwealth would not be required for impact to these TECs.

## E.2 Critically Endangered or Endangered species

Due to the negligible impact to fauna habitat predicted from the proposal and the fact that all species subject to assessment use the same habitat type, all threatened fauna species have been assessed together here. This assessment of significance has been completed for the following Endangered or Critically Endangered fauna species listed under the EPBC Act:

- Koala
- Spotted-tailed Quoll
- Regent Honeyeater
- Swift Parrot
- Gang-Gang Cockatoo.

An action is likely to have a significant impact on a Critically Endangered or Endangered species if there is a real chance or possibility that it will:

### 1. Lead to a long-term decrease in the size of a population

The study area contains known habitat for Koalas. Impact to the disturbed ground layer of approximately 80 m<sup>2</sup> will not lead to a long-term decrease in the size of the Koala population. No breeding habitat or trees used for foraging or resting will be impacted. Movement of Koalas will not be impacted by the proposal.

The habitat to be impacted is considered to be moderately suitable for Regent Honeyeater, Swift Parrot, Gang-Gang Cockatoo, and Spotted-tailed Quoll. While the habitat in the study area is not optimal for these species, there are some foraging opportunities and movement opportunities present in the study area relevant to all five species concerned.

The study area, and in particular the habitat to be impacted, does not provide suitable breeding resources or provide any significant foraging opportunities for the Spotted-tailed Quoll. No barriers to movement would be introduced. The removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road will not lead to a long-term decrease in the size of the population.

Regent Honeyeater and Swift Parrot may utilise the trees in the study area for foraging in seasons when the trees produce a sufficient resource. Breeding habitat for these species is not present in the study area and the proposal will not impact trees so the foraging resource that may be present will not be impacted. No barriers to movement would be introduced. As such, the removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road will not lead to a long-term decrease in the size of the population.

Gang-Gang Cockatoo may occur in the study area on rare occasion. This species is not known to commonly occur in the area with most records from the sandstone habitats in Dharawal National Park to the east of the study area. Occasional occurrences of this species in the study area cannot be discounted but the study area is considered unlikely to provide a significant or attractive foraging resource compared to the habitat in the Dharawal National Park. No breeding habitat would be impacted. No barriers to movement would be introduced. As such, the removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road will not lead to a long-term decrease in the size of the population.

## 2. Reduce the area of occupancy of the species

The estimated area of occupancy for the species subject to this assessment is as follows:

- Koala = 19,428 km<sup>2</sup> (Department of Agriculture, Water and the Environment, 2022a).
- Spotted-tailed Quoll = 2,512 km<sup>2</sup> (Threatened Species Scientific Committee, 2020).
- Regent Honeyeater = 300 km<sup>2</sup> (Department of the Environment, 2015).
- Swift Parrot = fluctuates from 18.5 km<sup>2</sup> to 355 km<sup>2</sup> (Threatened Species Scientific Committee, 2016).
- Gang-Gang Cockatoo = 30,000 km<sup>2</sup> (Department of Agriculture, Water and the Environment, 2022b).

The removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road will not reduce the area of occupancy for any of these species.

## 3. Fragment an existing population into two or more populations

Fragmentation is unlikely to occur from the proposal. Importantly, the proposal would not result in the breaking apart of large blocks of high-quality examples of habitat into many smaller blocks. No further habitat fragmentation on a landscape scale would occur because of the proposal. Isolation of habitats is unlikely to increase as the proposal will not entirely remove patches from the landscape. The removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road will not fragment an existing population of any of these species into two or more populations.

Movement of Regent Honeyeater, Swift Parrot and Gang-Gang Cockatoo will not be impacted. These are highly mobile flying species capable of covering large distances to utilise the landscape to follow resource availability. The removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road will not impact the ability of Koala or Spotted-tailed Quoll to move through the landscape, no barriers are being introduced and as such no fragmentation of a population would occur. The populations will exist in the same form as they currently exist.

## 4. Adversely affect habitat critical to the survival of a species

A definition of habitat critical to the survival of the Koala is not provided by the Department of Agriculture, Water and the Environment (2022c). However, the Koala is known to occur in the locality and it is likely that the habitats that surround the study area are critical to the survival of the species. However, the proposal will not adversely impact this habitat. The impact is limited to removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road which is not critical to the survival of the Koala.

Habitat that is critical to the survival of the Spotted-tailed Quoll includes large patches of forest with adequate denning resources and relatively high densities of medium-sized mammalian prey (Department of Environment, Land, Water and Planning, 2016). The study area does not include any denning resources or high densities of medium-sized mammalian prey so would not be considered habitat critical to the survival of the Spotted-tailed Quoll.

Department of the Environment (2016) states that habitat critical to the survival of the Regent Honeyeater includes:

- Any breeding or foraging habitat in areas where the species is likely to occur; and
- Any newly discovered breeding or foraging locations.

Key areas for Regent Honeyeater include the Bundarra-Barraba, Pilliga Woodlands, Mudgee-Wollar and the Capertee Valley and Hunter Valley areas in New South Wales, and the Chiltern and Lurg-Benalla regions of north-east Victoria (Department of the Environment,

2016). The study area is not within a recognised key area for Regent Honeyeater and is not mapped as an important area for Regent Honeyeater (see NSW Government Department of Planning Industry & Environment, 2022). As such, the habitat in the study area is unlikely to be critical to the survival of Regent Honeyeater.

Saunders and Tzaros (2011) state that of particular importance for conservation management of Swift Parrot are habitats which are used:

- for nesting,
- by large proportions of the Swift Parrot population,
- repeatedly between seasons (site fidelity), or
- for prolonged periods of time (site persistence).

The study area is not within a mapped important area for Swift Parrot (see NSW Government Department of Planning Industry & Environment, 2022). Nesting habitat is not present. Large populations of Swift Parrot are not known to utilise the study area. Swift Parrots are not known to repeatedly utilise the habitat in the study area between seasons. Swift Parrots are not known to use the study area for prolonged periods of time. As such, the habitat in the study area is unlikely to be critical to the survival of the Swift Parrot.

Habitat critical to the survival of the Gang-gang Cockatoo includes all foraging habitat during both the breeding and non-breeding season (Department of Agriculture, Water and the Environment, 2022b). This is a very broad statement that would encapsulate all habitat used by the species. The study area is unlikely to be critical to the survival of this species given the paucity of records on the Cumberland Plain. Nevertheless, the proposal will not adversely impact this habitat. The impact is limited to removal of approximately 25 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road which is not critical to the survival of Gang-gang Cockatoo.

#### **5. Disrupt the breeding cycle of a population**

The proposal would not impact on any breeding habitat or breeding resources for any of these threatened fauna species. The impact is limited to removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road which is not used for breeding. The habitat to be impacted does not form part of a critical foraging ground used during the breeding season or used in the lead up to breeding for any of these species. As such, the proposal is considered unlikely to disrupt the breeding cycle of a population.

#### **6. Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline**

The impact is limited to removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road. This impact is negligible and will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that a species is likely to decline.

#### **7. Result in invasive species that are harmful to a Critically Endangered or Endangered species becoming established in the Endangered or Critically Endangered species' habitat**

The action is unlikely to result in an invasive species harmful to these species becoming established in the habitat. The potential for weed invasion was considered possible with a proposal of this nature and appropriate controls are required during construction and operation to reduce this threat. The management of invasive species would be managed under the construction environmental management plan using best practice methods.



## 8. Interfere with the recovery of the species.

The recovery strategies identified for Koala (Department of Agriculture, Water and the Environment, 2022c) include:

- Strategy 1: Build and share knowledge
- Strategy 2: Engage and partner with the community in listed Koala conservation
- Strategy 3: Increase the area of protected habitat for the listed Koala
- Strategy 4: Integrate listed Koala conservation into policy, statutory and land use plans
- Strategy 5: Strategically restore listed Koala habitat
- Strategy 6: Actively manage listed Koala metapopulations.

The recovery objectives identified for Spotted-tailed Quoll (Department of Environment, Land, Water and Planning, 2016) include:

- Determine the distribution and status of Spotted-tailed Quoll populations throughout the range, and identify key threats and implement threat abatement management practices.
- Investigate key aspects of the biology and ecology of the Spotted-tailed Quoll to acquire targeted information to aid recovery.
- Reduce the rate of habitat loss and fragmentation on private land.
- Evaluate and manage the risk posed by silvicultural practices.
- Determine and manage the threat posed by introduced predators (foxes, cats, wild dogs) and of predator control practices on Spotted-tailed Quoll populations.
- Determine and manage the impact of fire regimes on Spotted-tailed Quoll populations.
- Reduce deliberate killings of Spotted-tailed Quolls.
- Reduce the frequency of Spotted-tailed Quoll road mortality.
- Assess the threat Cane Toads pose to Spotted-tailed Quolls and develop threat abatement actions if necessary.
- Determine the likely impact of climate change on Spotted-tailed Quoll populations.
- Increase community awareness of the Spotted-tailed Quoll and involvement in the Recovery Program.

The recovery strategies identified for Regent Honeyeater (Department of the Environment, 2016) include:

- Strategy 1: Improve the extent and quality of regent honeyeater habitat
- Strategy 2: Bolster the wild population with captive-bred birds until the wild population becomes self-sustaining.
- Strategy 3: Increase understanding of the size, structure and population trends of the wild population of regent honeyeaters
- Strategy 4: Maintain and increase community awareness, understanding and involvement in the recovery program

The recovery actions identified for Swift Parrot (Saunders and Tzaros, 2011) include:

- Action 1 - Identify the extent and quality of habitat.
- Action 2 - Manage and protect Swift Parrot habitat at the landscape scale.
- Action 3 - Monitor and manage the impact of collisions, competition and disease.
- Action 4 - Monitor population and habitat.

There is no adopted or made Recovery Plan for Gang-Gang Cockatoo.

The proposal will not interfere with the actions, strategies or objectives for recovery of these species.

## Conclusion

After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant impact to the Critically Endangered or endangered fauna species. The predicted impact to habitat for these species is minor. A referral to the Commonwealth would not be required.

### E.3 Vulnerable species

Due to the negligible impact to fauna habitat predicted from the proposal and the fact that all species that have been assessed use the same habitat type, all fauna species have been assessed together here. This assessment of significance has been completed for the following Vulnerable fauna species listed under the EPBC Act:

- Large-eared Pied Bat
- Grey-headed Flying-fox
- White-throated Needletail.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

#### 1. Lead to a long-term decrease in the size of an important population of a species

There is insufficient data to estimate abundance or population trends of the Large-eared Pied Bat. However, given the minimal impact to potential foraging habitat from the proposal and that there would be no impact to any breeding habitat the proposal is unlikely to lead to a long-term decrease in the size of an important population.

The Grey-headed Flying-fox exists as one interconnected population along the eastern Australian coastal belt from Rockhampton in central Queensland to Melbourne in Victoria. As a result, for this assessment, the impact has been considered in terms of impact to an 'important population'. There are no roost camps in the study area and the action would not affect any known permanent roosting, breeding / maternity site. The study area does not contain a significant foraging resource.

White-throated Needletail breeds in Asia, from central and south-eastern Siberia and Mongolia, east to the Maritime Territories of Russia, Sakhalin and the Kuril Islands and south to northern Japan and north-eastern China (Department of the Environment, 2022a). Most White-throated Needletails spend the non-breeding season in Australasia, mainly in Australia (Department of the Environment, 2022a). The study area does not form part of a critical staging point for migration and the study area does not contain a significant foraging resource.

Impact to the disturbed ground layer of approximately 25 m<sup>2</sup> will not lead to a long-term decrease in the size of the population of Large-eared Pied Bat, Grey-headed Flying-fox or White-throated Needletail.

#### 2. Reduce the area of occupancy of an important population

The removal of approximately 80 m<sup>2</sup> of disturbed ground layer adjacent to Appin Road will not reduce the area of occupancy for any of these species.

The area of occupancy for Large-eared Pied Bat is approximately 9,120 km<sup>2</sup> (Department of the Environment, 2022a). The proposal will not have a noticeable impact on the area of occupancy for this species and no breeding sites will be impacted.

The area of occupancy of the Grey-headed Flying-fox is not known but the species exists as one interconnected population along the eastern Australian coastal belt from Rockhampton in central Queensland to Melbourne in Victoria. The area occupied by this species would remain

the same after the action. The proposal will not have a noticeable impact on the area of occupancy for this species.

The area of occupancy of the White-throated Needletail in Australia has been estimated at 126,200 km<sup>2</sup> (Department of the Environment, 2022a). The proposal will not have a noticeable impact on the area of occupancy for this species.

### **3. Fragment an existing important population into two or more populations**

Highly mobile species such as bats and birds like the White-throated Needletail are expected to be less impacted by fragmentation. The proposal would not fragment an important population as individuals would still be able to disperse between foraging habitats. No barriers would be created and genetic exchange within the population and dispersal would not be disrupted. These species will freely fly over cleared land to reach foraging or breeding grounds.

### **4. Adversely affect habitat critical to the survival of a species**

Sandstone cliffs and fertile woodland valley habitat within close proximity of each other is habitat of critical importance to the Large-eared Pied Bat (Department of Agriculture, Water and the Environment, 2021). Such habitat is found in the locality. Available roosts are not evenly distributed throughout the landscape. The species requires a combination of sandstone cliff/escarpment to provide roosting habitat that is adjacent to higher fertility sites (Department of Agriculture, Water and the Environment, 2021). The structure of primary nursery roosts appears to be very specific, i.e. arch caves with dome roofs (that need to be deep enough to allow juvenile bats to learn to fly safely inside) and with indentations in the roof (presumably to allow the capture of heat) (Department of Agriculture, Water and the Environment, 2021). These physical characteristics are not very common in the landscape and therefore a limiting factor. Importantly, no critically important habitat in the form of caves will be impacted by the proposal.

The Grey-headed Flying-fox typically exhibits a large home range and is known to travel distances of at least 50 kilometres from roost sites to access seasonal foraging resources. Spring foraging resources are considered to be critical to the survival of the species. Reliable resources during late gestation, birth and early lactation are required to avoid rapid weight loss in adults and poor reproductive success (Department of the Environment, 2022c). There are no known roost camps within the study area and the study area does not provide critical roosting habitat. It is unlikely that the impact to the disturbed ground layer of approximately 25 m<sup>2</sup> would adversely affect habitat for this species as foraging or breeding habitat will not be removed.

Habitat critical to the survival of White-throated Needletail has not been identified but it is unlikely that the impact to the disturbed ground layer of approximately 80 m<sup>2</sup> would adversely affect habitat for this species.

### **5. Disrupt the breeding cycle of an important population**

The breeding cycle of these three species will not be disrupted by the proposal.

As stated above there would be a minor impact on foraging habitat for these species. Importantly, no critically important habitat in the form of breeding habitat or critical foraging areas will be impacted by the proposal. Extensive foraging resources are available in the locality that would provide suitable resources during the maternity season or in the lead up to breeding. The habitats in the study area are not limiting for these species.

White-throated Needletail breeds in Asia, from central and south-eastern Siberia and Mongolia, east to the Maritime Territories of Russia, Sakhalin and the Kuril Islands and south

to northern Japan and north-eastern China (Department of the Environment, 2022a). Most White-throated Needletails spend the non-breeding season in Australasia, mainly in Australia (Department of the Environment, 2022a). The study area does not form part of a critical staging point for migration.

**6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

The impacts to foraging habitat are minimal and no evidence of breeding habitat has been identified from the study area. This impact is not expected to lead to a decline in these species in this region considering the magnitude of this impact and the expanse of high-quality foraging habitat available to local animals in the coastal area.

**7. Result in invasive species that are harmful to a vulnerable species becoming established in the Vulnerable species' habitat**

The action is unlikely to result in an invasive species harmful to these species becoming established in the habitat. The potential for weed invasion was considered possible with a proposal of this nature and appropriate controls are required during construction and operation to reduce this threat. The management of invasive species would be managed under the construction environmental management plan using best practice methods.

**8. Introduce disease that may cause the species to decline, or**

There are no known disease issues affecting these species in relation to the proposal. The action would be unlikely to increase the potential for significant disease vectors to affect local populations. It is the intention to use current best practice hygiene protocols to prevent the introduction or spread of pathogens.

**9. Interfere substantially with the recovery of the species.**

The *National recovery plan for the large-eared pied bat Chalinolobus dwyeri* (Department of Environment and Resource Management, 2011) outlines the following recovery objectives:

- Specific Objective 1: Identify priority roost and maternity sites for protection.
- Specific Objective 2: Implement conservation and management strategies for priority sites.
- Specific Objective 3: Educate the community and industry to understand and participate in the conservation of the Large-eared Pied Bat.
- Specific objective 4: Research the Large-eared Pied Bat to augment biological and ecological data to enable conservation management.
- Specific objective 5: Determine the meta-population dynamics throughout the distribution of the Large-eared Pied Bat.

The proposal would not interfere with any of the recovery objectives, actions and performance criteria outlined in the *National recovery plan for the large-eared pied bat Chalinolobus dwyeri* (Department of Environment and Resource Management, 2011).

There is no adopted or made Recovery Plan for the Grey-headed Flying-fox.

There is no adopted or made Recovery Plan for the White-throated Needletail.

**Conclusion**

After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant impact to the Critically Endangered or endangered fauna species. The predicted impact to habitat for these species is minor. A referral to the Commonwealth would not be required.

## About this release

Reference number	EIA-P05-G01-T05
Title	EIA template: Minor works review of environmental factors
Parent procedure	EIA-P05-2
Prepared by	Specialist (Planning and Assessment) Senior Specialist (Planning and Assessment)
Approved by	Director Environmental Policy, Planning and Assessment
Document location	Objective: Global Folder \ RMS Global Folder \ ENVIRONMENT \ Procedures \ Environment Planning and Assessment Procedures \ Environmental Planning and Assessment Procedures – EIA-P01 Routine and minor works
Document status	Version 4.1 April 2022

Version	Date	Revision description
1.0	05.01.09	First issue
1.1	20.08.09	Amendments to Section 1, Section 1.2 Section 2 and Section 5 – New sign-off for the environmental assessment contractor.
2.0	01/11/11	Table formatting and style amended throughout. Best practice updates. Changes based on legislation amendments.
2.1	13/07/12	Addition of Growth Centres SEPP consultation.
2.2	02/05/13	Update to Clause 228 checklist.
2.3	15/07/13	Update to Commonwealth Minister portfolio
2.4	27/07/15	Included Maritime references and updated hyperlinks
2.5	30/09/15	Update to incorporate requirements of EPBC Act strategic assessment
2.6	11/08/17	Various minor edits. Updated hyperlinks and reference to WaterNSW. Rebranded and made web accessible.
2.7	05/03/18	Update to incorporate legislative updates (EP&A Act, ISEPP, BC Act), agency name changes, RMS delegation title changes
2.8	05/06/18	Updated to incorporate legislative updates (Coastal Management SEPP), edits to Section 3.3 (Noise and vibration), Section 3.7 (Biodiversity) and Section 3.12 (Waste) and various minor edits.
2.9	03/09/18	Marco enabled checkboxes added to replace Word standard checkboxes and minor edits.
3.0	04/10/18	Updated to incorporate legislative updates (ISEPP)
4.0	23/02/22	Rebranded to meet current Transport for NSW Style Guide, updates to EP&A Regulation 2021 (including change from clause 228 to section 171) and addition of acknowledgement of Country.
4.1	4/04/2022	State Environmental Planning Policy updates (consolidated SEPPs 2021).

