Review of Environmental Factors

Port Stephens Cutting – Early Works

Quality solutions. Sustainable future.

GeoLINK
environment | engineering | planning | design

GeoLINK Consulting Pty Ltd

PO Box 119
Lennox Head NSW 2478
T 02 6687 7666

PO Box 1446
Coffs Harbour NSW 2450
T 02 6651 7666

PO Box 1267
Armidale NSW 2350
T 02 6772 0454

PO Box 229
Lismore NSW 2480
T 02 6621 6677

info@geolink.net.au

Prepared for: Tamworth Regional Council

UPR	Description	Issued By	Date Issued
4513-1007	Version 1	MCZ	24/03/2023
4513-1010	Final	MCZ	22/05/2023

Table of Contents

Illustrations

Tables

Plates

Figures

Appendices

Executive Summary

GeoLINK has been engaged by Tamworth Regional Council to prepare a Review of Environmental Factors for the early works bulk earthworks material investigations related to the Port Stephens Cutting upgrade project, on Nowendoc Road east of Tamworth, NSW.

Need for the Activity

In order to test for material suitability for re-use as pavement and assess construction methodology for the main works related to the upgrade of a section of Nowendoc Road, locally known as Port Stephens Cutting, test pit excavations are required to conduct the study.

Statutory and Planning Framework

All relevant statutory planning instruments have been examined in relation to the proposed road works. Development consent is not required for the proposal pursuant to Division 17, Section 2.109 of State Environmental Planning Policy (Transport and Infrastructure) 2021. However, the proposal becomes an 'Activity' for the purposes of Part 5 of the *Environmental Planning and Assessment Act 1979* and is subject to an environmental impact assessment (this Review of Environmental Factors).

Consultation

Consultation with Council is generally required in accordance with Sections 2.10 to 2.12 and 2.14 of State Environmental Planning Policy (Transport and Infrastructure) 2021. However, in accordance with Section 2.17(1), Council is the proponent and determining authority. As such, consultation with Council is not required. Any relevant consultation within Council would be expected to continue internally throughout the design process.

Environmental Impacts

The main environmental impact of the Activity is soil and rock disturbance and vegetation removal related to the excavation at the four test pit locations. Up to 120 m^2 (proposed removal of 30 m^2 per Test Pit site) of Good condition Plant Community Types PCT 3521 - *Northwest White Box Woodland* would be removed, however, it is not consistent with the characteristics of any Threatened Ecological Communities listed under the *Biodiversity Conservation Act 2016* or *Environment Protection and Biodiversity Conservation Act 1999*. One Weed of National Significance (Blackberry) listed in the National Weeds Strategy and managed under the *Biosecurity Act 2015* occurs at the site. A targeted site survey for *Euphrasia Arguta*, which was until recently thought to be extinct, was undertaken as part of the Biodiversity Assessment Report (refer to **Appendix A**). No specimens were found during the survey, however, due to the cryptic nature of the plant, assumptions on the presence and safeguards and mitigation measures have been included in this REF. Risks associated with the Activity would be suitably managed through effective implementation of the safeguards of this Review of Environmental Factors.

Other potential environmental impacts would be generally minor in nature. A variety of safeguards have been developed to minimise the risk and magnitude of potential impacts posed by the Activity to the environment.

Justification and Conclusion

The Activity would improve the understanding of rock material properties for potential re-use in the main works for the Port Stephens Cutting upgrade, which would improve road safety for the section of Nowendoc Road. With effective implementation of the safeguards of this Review of Environmental Factors, the Activity is considered unlikely to have any significant environmental impacts.

1. Introduction

1.1 Activity Identification

Tamworth Regional Council (TRC) propose to upgrade a section of Nowendoc Road, locally known as Port Stephens Cutting, including widening of the road to improve safety. The road section consists of approximately 5 km in length through a mountainous and highly vegetated terrain.

The Port Stephens Cutting Upgrade project is expected to be undertaken in two stages. The early works involves bulk material testing to investigate the suitability of the in-situ rock material for re-use as pavement material for the construction stage, which consists of the main works of the road upgrade project.

This report relates specifically to the early works. The objectives of this stage include material testing and assessment of the difficulty of excavating the material to inform the cost estimation for the construction stage. The activities in this stage are to be undertaken at four different test pit location which have been selected to represent the three different rock types encountered along the route.

The locations of the proposed works and the assessment areas for this REF are shown in **Illustration 1.1**. All construction and operational activities associated with the proposed works within the early works is referred to herein as 'the Activity'.

1.2 Purpose of this Report

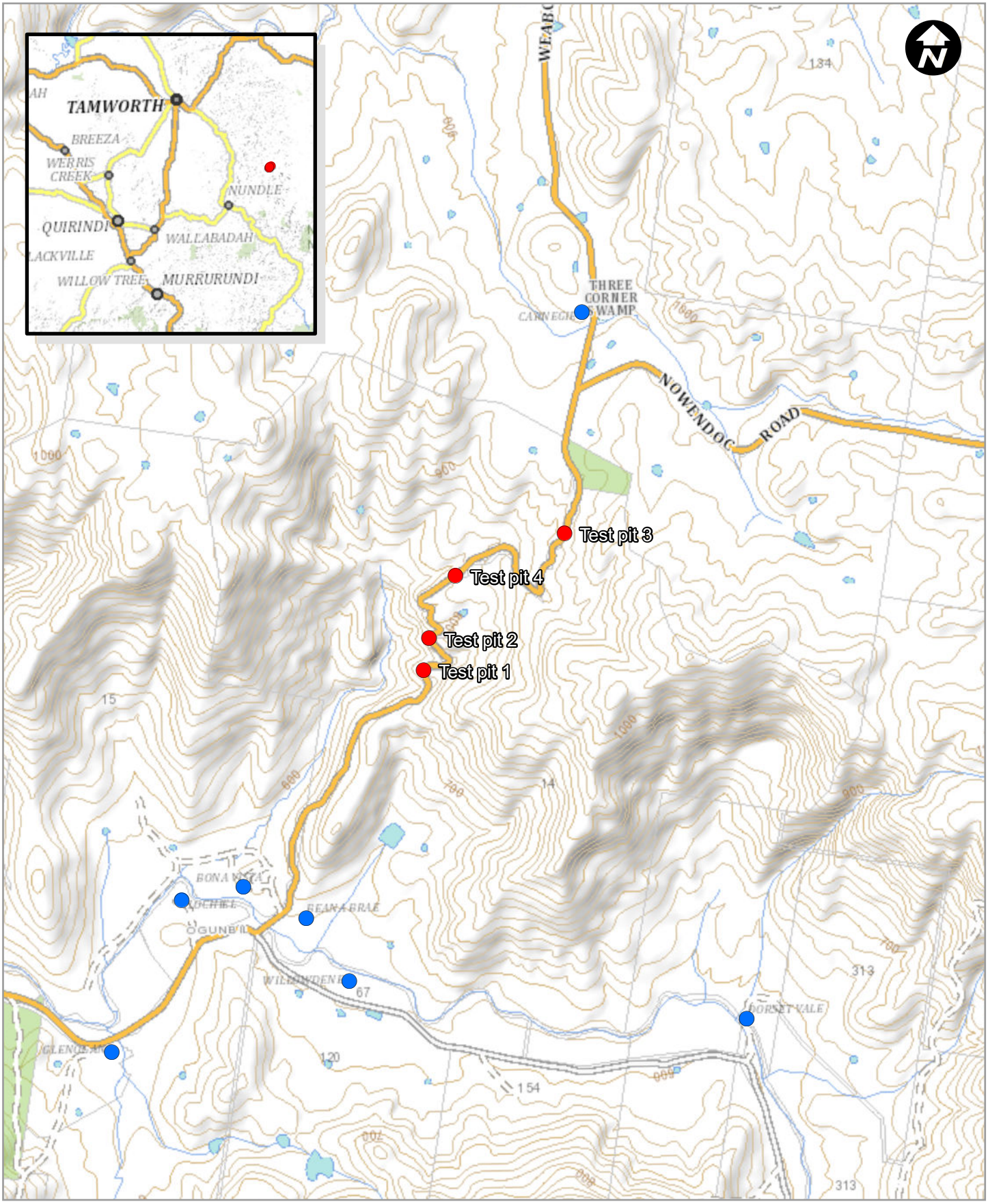
This Review of Environmental Factors (REF) has been prepared by GeoLINK on behalf of TRC. For the purposes of the Activity, TRC is the proponent and the determining authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this REF is to describe the Activity, assess and document the likely impacts of the Activity on the environment, and provide safeguards/ mitigation measures to be implemented.

The description of the Activity and associated environmental impacts have been undertaken in the context of Section 171 of the Environmental Planning and Assessment (EP&A) Regulation 2021, having regard for the *Guidelines for Division 5.1 Assessments* (DPE 2022), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act) and the Australian Government *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, which requires the determining authority (TRC) to examine and consider 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 Activity is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared under Division 5.1, Subdivision 3 of the EP&A Act or approval to be sought from the Minister for Planning 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, and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report.
- The potential for the Activity to significantly impact a matter of national environmental significance or Commonwealth land and the need to make a referral to the Australian Government Department of Climate Change, Energy, the Environment and Water for a decision by the Commonwealth Minister on whether assessment and approval is required under the EPBC Act.



LEGEND

- Test pit location
- Sensitve receiver

0 600 Metres

Site Locality - Illustration 1.1

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Department of Customer Services
Date: 17/03/2023

2. Description of the Activity

2.1 Site Location

The Activity is located along the 5 km section of Nowendoc Road known locally as Port Stephens Cutting. The site is located approximately 45 km southeast of the city of Tamworth, NSW (refer to **Illustration 1.1**). The Activity is proposed at four discrete locations along the route at chainages: CH1940 (TP1), CH2310 (TP2), CH2870 (TP4) and CH3970 (TP3). Excavation works would occur adjacent to the existing road and in the road reserve located within a vegetated, rural area, as shown in **Plate 2.1** to **Plate 2.4**.

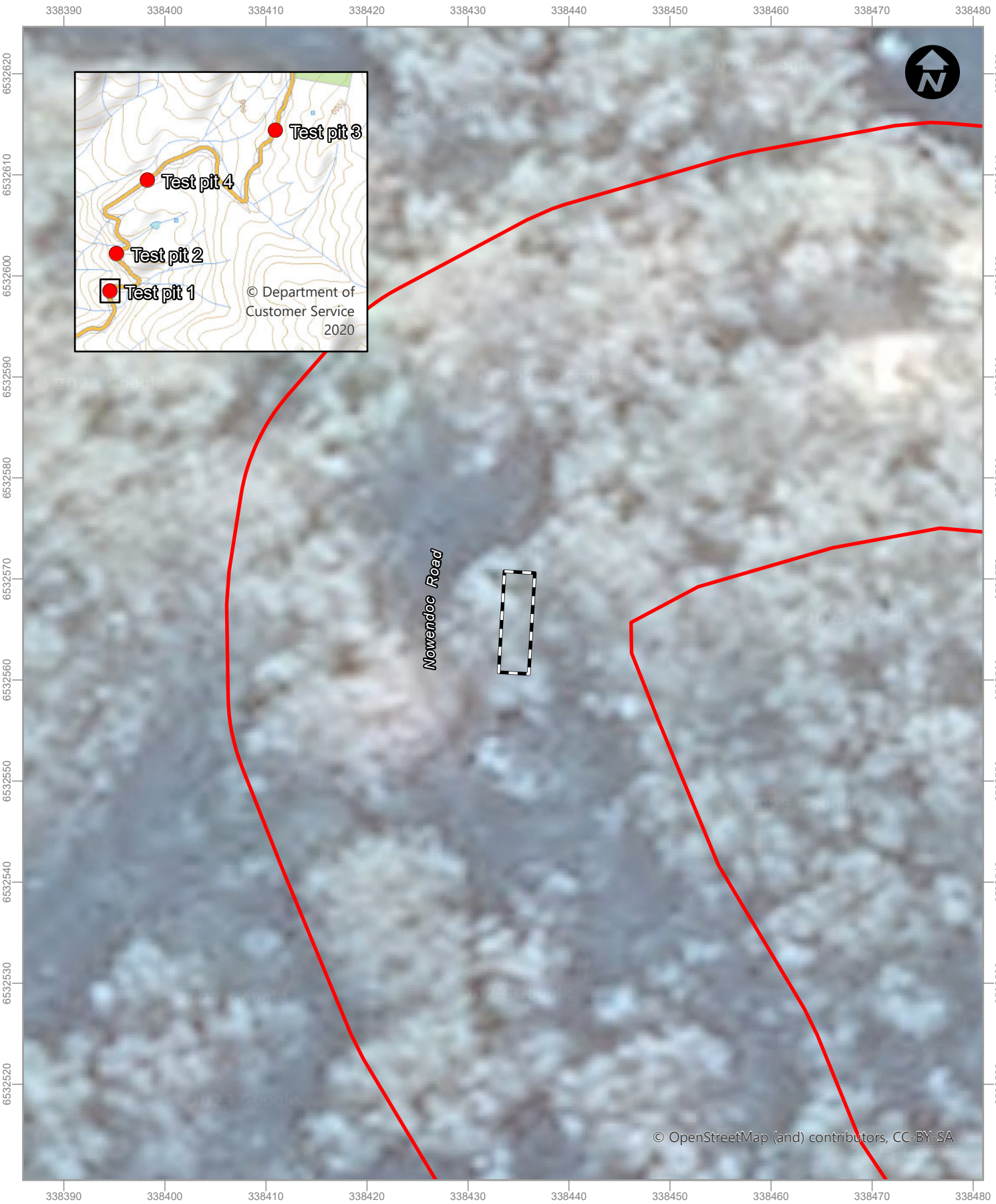
A site analysis plan is provided in **Illustration 2.1**.

Plate 2.1 View of upward side of road at location of test pit 1.

Plate 2.2 View of upward side of road at location of test pit 2.

Plate 2.3 View of upward side of road at location of test pit 3.

Plate 2.4 View of road at location of test pit 4.



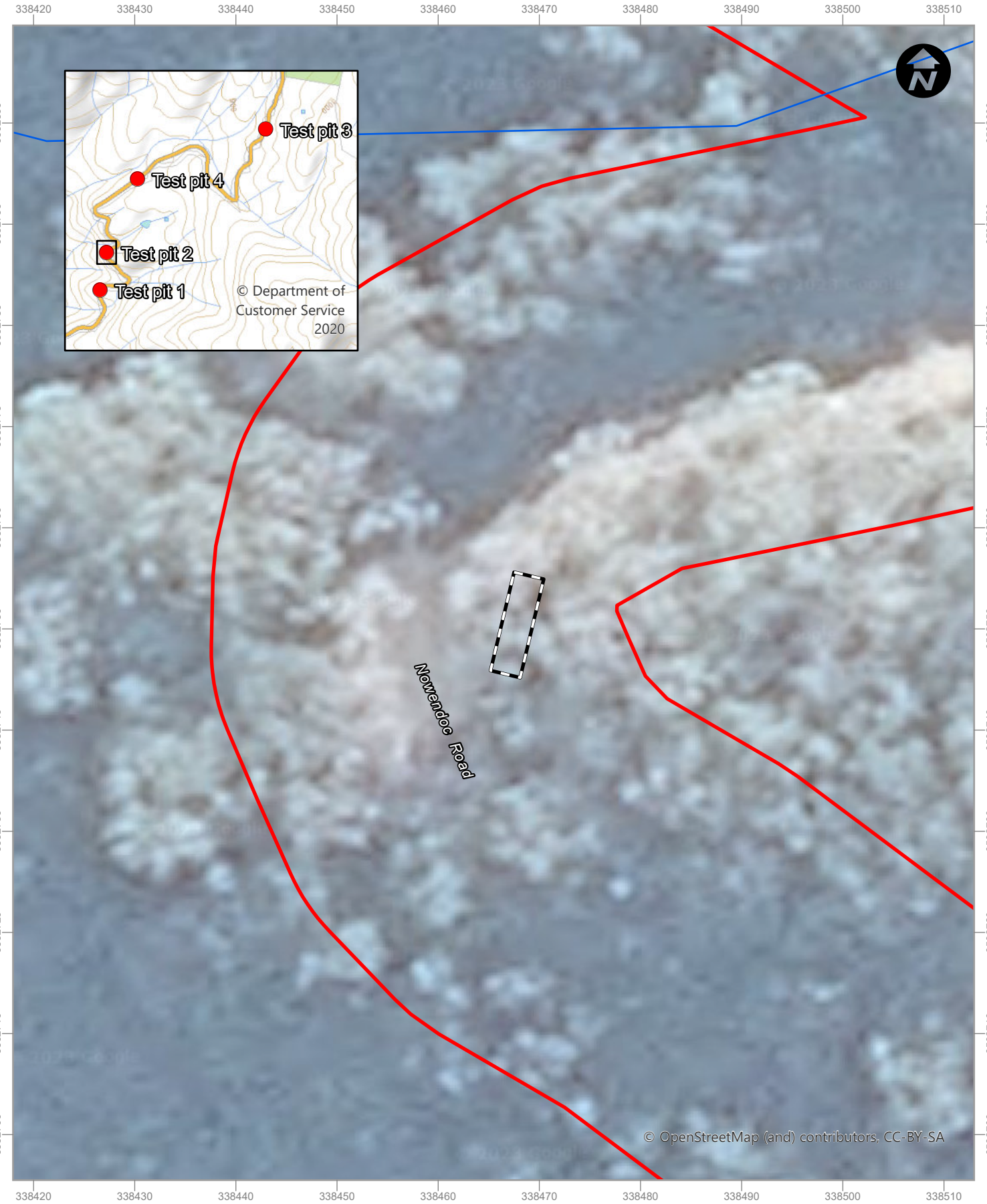
LEGEND

- Survey area
- Test pit location impact area

0 10 Metres

Site Analysis
Illustration 2.1- Sheet 1 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 20/03/2023



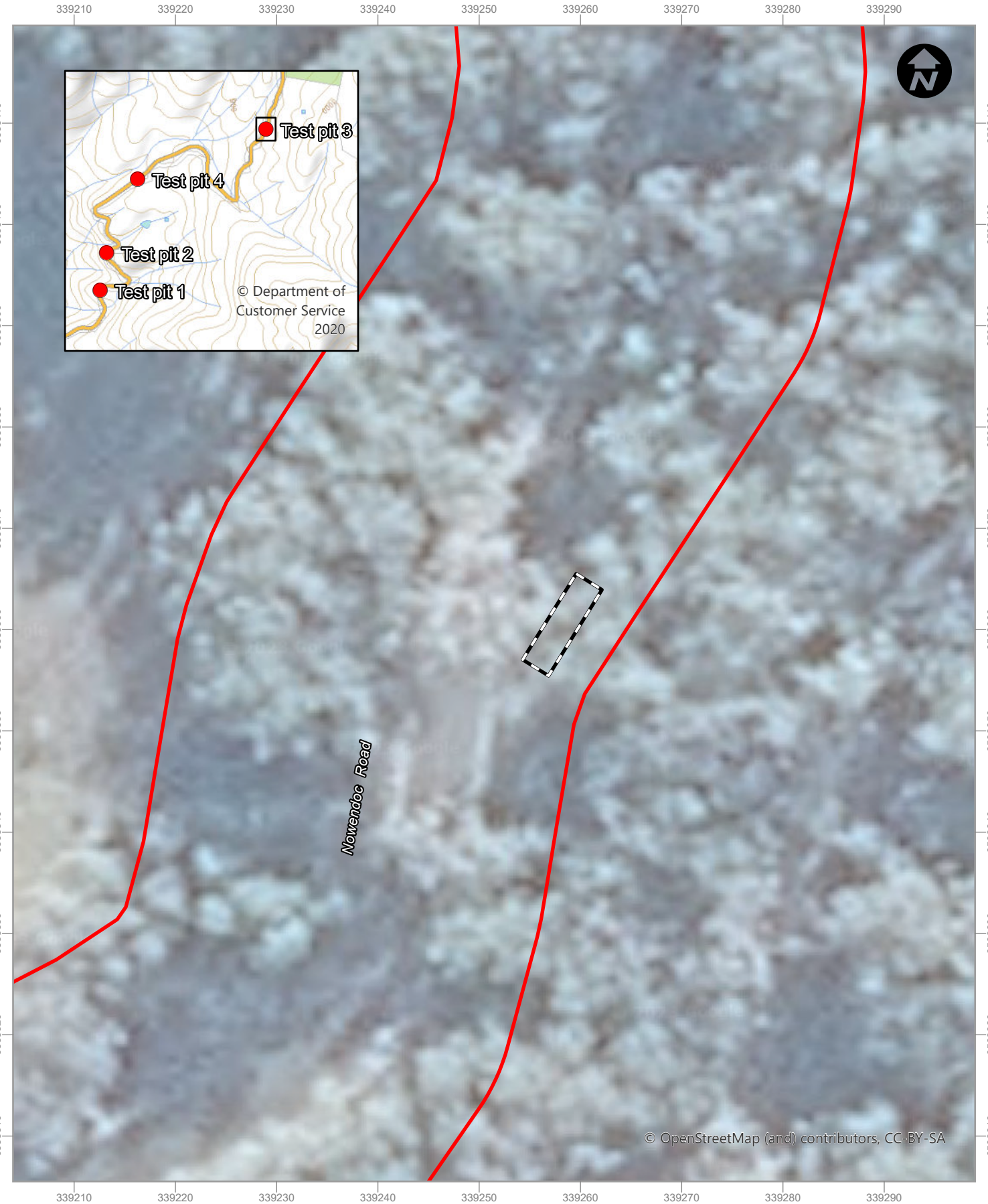
LEGEND

- Survey area
- Test pit location impact area
- Watercourse

0 10 Metres

Site Analysis
Illustration 2.1- Sheet 2 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 20/03/2023



LEGEND

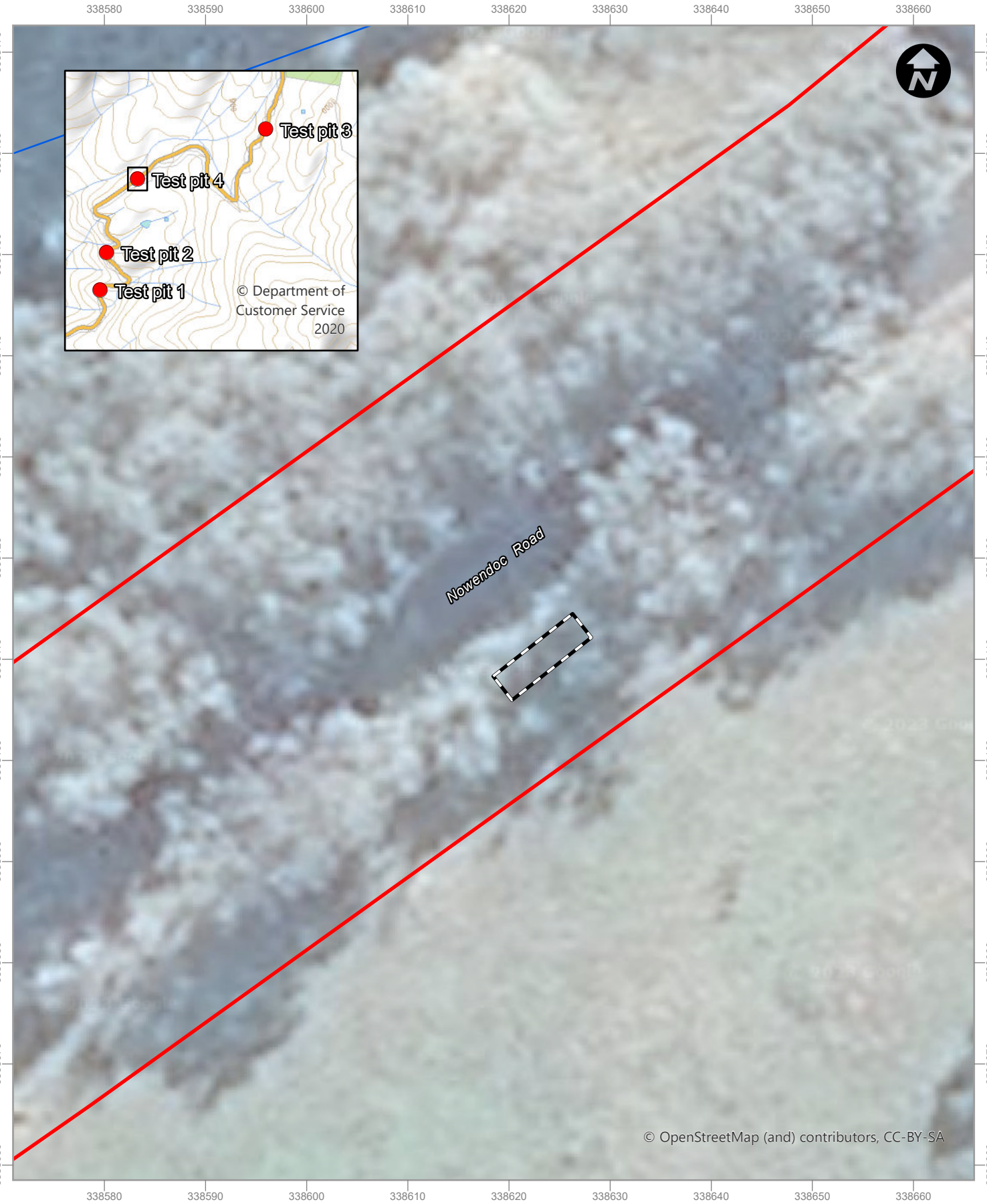
Survey area

Test pit location impact area

0 10 Metres

Site Analysis
Illustration 2.1- Sheet 3 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 20/03/2023



LEGEND

- Survey area
- Test pit location impact area
- Watercourse

0 10 Metres

Site Analysis
Illustration 2.1- Sheet 4 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 20/03/2023

2.2 The Proposed Activity

2.2.1 Overview

The Activity would be the excavation of bulk material at four test pit locations for testing of the in-situ rock material located within the cutting on the upslope side of the Port Stephens Cutting. The testing is to determine the suitability of the material for reuse as road base for the construction stage of the Port Stephens Cutting upgrade. In addition, the opportunity will be taken to assess the construction methodology for the excavations related to the main works road widening. Port Stephens Cutting is a narrow section of road with many turns where the safety would be improved through road widening and an upgrade.

The test pits would be excavated for a length of up to 10 m long, adjacent to the southbound lane, and up to 3 m into the upward slope adjacent to the road. The resulting test pits would have a floor at road surface height. The pits would require the overburden, including vegetation, to be cleared. These excavated sites would be temporarily left in a stable condition post excavation until the widening occurs for the construction stage works, whereby they will be further widened as required by the design to achieve the ultimate road width.

Construction methodology for the planned works would include closing the road for a day, excavating rock samples from the four test pit locations with an excavator, loading the material directly into truck and dogs, and transporting the material to Winton quarry for crushing, sampling, and testing. Material removed would be transported offsite immediately with no stockpiles left on site.

The future benefits from determining material suitability and assessing construction methodology would have a flow on effect for the main works in the form of better processes and construction methods.

2.2.2 Construction Hours and Duration

Construction working hours would be undertaken during the periods specified in the *Draft Construction Noise Guideline* (NSW Environment Protection Authority, 2020). These are:

- Monday to Friday 7:00 am to 6:00 pm.
- Saturday 8:00 am to 1:00 pm.
- Sunday and Public Holidays No work.

The Activity is expected to take three days to complete.

2.2.3 Plant, Equipment and Materials Required

The main plant and equipment required for the Activity may include (but not be limited to):

- Excavator;
- Truck and dogs; and
- Traffic control.

2.2.4 Ancillary Facilities

Plant parking would be required for the Activity. Plant would be parked in a safe area within the road reserve, ensuring it doesn't introduce a traffic hazard and avoiding areas that would disturb vegetation and heritage. Safeguards and mitigation measures have been included in this REF to reduce impacts. The intention is to float plant to site for start of the Activity and float plant offsite at completion.

No stockpiling would be required on site. Materials removed during the works would be transported directly off site to an existing quarry for crushing.

2.3 Public Utility Adjustment

There are no existing services within the test pit locations. No relocation/ adjustment of utilities would be required as a result of the Activity.

3. Statutory and Planning Framework

3.1 Environmental Planning and Assessment Act 1979

The Activity does not require development consent, however it requires environmental assessment and approval pursuant to Part 5, Division 5.1 and Section 5.5 of the EP&A Act whereby determining authorities, when assessing activities under Division 5.1, must examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of that activity. To ensure the Activity adequately addresses the requirements of Section 5.5, an assessment of the Activity's consistency with relevant EPIs including State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs) has been completed.

3.2 State Environmental Planning Policies

3.2.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) aims to facilitate the effective delivery of infrastructure across the State, including roads and road infrastructure facilities. Section 2.109 of the TISEPP 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 Activity is appropriately characterised as development for the purposes of a road or road infrastructure facilities, which includes alterations or additions to an existing road (such as widening, narrowing, duplication or reconstruction of lanes, changing the alignment or strengthening of the road), and is to be carried out by or on behalf of ARC, it can be assessed under Part 5 of the EP&A Act. Development consent is therefore not required, and the Activity is defined as an 'Activity' for the purposes of Part 5 of EP&A Act.

The Activity is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not affect land mapped as Coastal Wetland or Littoral Rainforest under the State Environmental Planning Policy (Resilience and Hazards) 2021. The Activity is not development identified under State Environmental Planning Policy (Planning Systems) 2021.

Part 2.2 of the TISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development unless there is an exception. Consultation as required by TISEPP is discussed in **Section 4** of this REF.

3.2.2 State Environmental Planning Policy (Biodiversity & Conservation) 2021

State Environmental Planning Policy (Biodiversity and Conservation) 2021 (SEPP Biodiversity and Conservation) came into force on 1 March 2022 and incorporated the repealed provisions of SEPP (Koala Habitat Protection) 2020, SEPP (Koala Habitat Protection) 2021, and the SEPP Vegetation in Non-Rural areas 2017, amongst others.

On this basis of Section 60O of the *Local Land Services Act 2013* (LLS Act) (refer **Table 3.2**), and given the Activity is a Part 5 Activity, any vegetation clearing is authorised by way of compliance with Part 5 of the EP&A Act (preparation and determination of this REF). Consent under Chapter 2 (Vegetation in non-rural areas) of SEPP Biodiversity and Conservation is not required.

Chapter 4 of SEPP Biodiversity and Conservation applies to land zoned RU1 in select Local Government Areas (LGA) in NSW, including the Tamworth Regional area.

The principles of the Koala Habitat Protection SEPP are to:

- Help reverse the decline of Koala populations by ensuring Koala habitat is properly considered during the development assessment process.
- Provide a process for councils to strategically manage Koala habitat through the development of Koala plans of management.

Part 2 of the Koala SEPP 2021 only applies to Part 4 development applications under the EP&A Act. As the proposal is an Activity under Part 5 of the EP&A Act, the Policy does not technically apply. It is Council's responsibility however, to consider environmental issues relating to their works to the fullest extent possible, including impacts on Koalas.

The Activity is adjacent to the road, which is a previously disturbed site. No evidence of Koala usage was detected during the ecological site inspection and the Activity is unlikely to significantly affect Koala habitat (refer to **Section 5.1** for assessment of biodiversity impacts).

3.3 Local Environmental Plans

The Activity is located within the Tamworth Regional LGA and the Tamworth Regional LEP 2010 applies. In accordance with the Tamworth Regional LEP, the Activity is located on land zoned RU1 Primary Production. As discussed in **Section 3.2.1**, the Activity can proceed without development consent pursuant to section 2.109 of the TISEPP.

The Tamworth Regional Development Control Plan 2010 does not apply as development consent is not required.

An assessment of the Activity against the relevant provisions of the Tamworth Regional LEP is provided in **Table 3.1** below.

Table 3.1 Tamworth Regional Local Environmental Plan 2010

Clause	Comment
5.10 Heritage Conservation	There is a local heritage listed item, identified as a hand laid stone wall, located along the northbound lane of Port Stephens Cutting. Further discussion provided in **Section 5.3**.
5.11 Bush Fire Hazard Reduction	The Activity is not considered to increase bushfire risk. As such, this clause does not apply.
5.21 Flood Planning	The site is not mapped as flood prone. As such, this this clause does not apply.
6.1 Earthworks	Earthworks are required to carry out the Activity. Mitigation measures would be in place to ensure any impacts associated with the earthworks are minimised, such as erosion and sediment controls. Further discussion on the earthworks associated with the Activity is provided in **Section 5.5**.

3.4 Other NSW Legislation

Section 3.4 lists other NSW legislation relevant to the assessment of the Activity and comments on the implications for the Activity.

Table 3.2 NSW Legislation

Legislation	Section(s)	Comment
Environmental Planning and Assessment Act 1979	Section 1.7	Section 1.7 of the EP&A Act relates to the application of Part 7 of the *Biodiversity Conservation Act 2016* (BC Act) and Part 7A of the *Fisheries Management Act 1994* (FM Act). Biodiversity has been assessed in **Section 5.1** and **Appendix A**. The Activity is unlikely to have a significant impact on biodiversity or threatened species or communities. The provisions of the FM Act are not triggered by the Activity.
	Section 5.5	The determining authority in its consideration of an activity shall examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of that activity. This REF fulfils this requirement.
Environmental Planning and Assessment Regulation 2021	Section 171	Section 171 factors have been considered to assess the likely impacts of the Activity on the natural and built environment (refer to **Section 7.1**). It is not expected that the Activity would result in a significant impact.
Fisheries Management Act 1994	Section 200	A permit is required when carrying out dredging and reclamation work on water land. The locations of the test pits do not fall on any waterways, including unnamed tributaries. Therefore, it is unlikely a permit will be required. If dredging or reclamation works are required, then TRC would obtain a permit for work on water land prior to works commencing.
	Sections 219-220	A permit is required when barriers to the movement of fish including water course crossings are to be constructed or modified. As the test pit locations are not at watercourse crossings, the Activity would not impact fish passage.
	Sections 204-205	A permit is required to harm marine vegetation. The Activity does not involve harming marine vegetation.
	Schedules 4, 4A, 5 and 6	The work does not occur in an area that supports threatened aquatic habitat for flora or fauna. Thus, the Activity would not impact any threatened aquatic species and communities.
Heritage Act 1977		Searches of the State Heritage Register, State Heritage Inventory and LEP heritage listings were undertaken as part of the heritage assessment (**Appendix B**). There are no Australian or State Heritage listed items located within close proximity to the site. There is a locally listed heritage item, identified as a hand laid stone wall, located along the northbound lane on the downward slope of Port Stephens Cutting. Refer to **Section 5.3**.
National Parks and Wildlife Act 1974	Sections 87(1), 90	The Activity site is disturbed and developed land. The provisions of the Act are unlikely to be triggered by the Activity. Works would cease if any potential artefact or place of significance is encountered during the Activity. NSW Heritage, TRC and Tamworth Local Aboriginal Land Council (TLALC) would be notified immediately.

Legislation	Section(s)	Comment
		Search results conducted as part of the Aboriginal Cultural Heritage Assessment (**Appendix D**) identified three registered Aboriginal sites previously recorded within close proximity to Nowendoc Road (refer to **Section 5.2** for further discussion).
Biosecurity Act 2015		In NSW, the administration of noxious weed control is the responsibility of the Minister for Primary Industries under the *Biosecurity Act 2015*. The Act is implemented and enforced by the Local Control Authority for the area, usually local government, or NSW Agencies. Biosecurity risk weeds would be managed in accordance with the Act.
Protection of the Environment Operations Act 1997		There are no Protection of the Environment Policies that are relevant to the Activity. No licenses would be required pursuant to the *Protection of the Environment Operations Act 1997*. TRC and/ or contractors working on behalf of TRC are required to notify the Environment Protection Authority when a 'pollution incident' occurs that is likely to impact upon the environment.
	Section 115	It is an offence to negligently dispose of waste in a manner that harms the environment. Waste would be managed in accordance with the *Waste Avoidance and Resource Recovery Act 2001*. The Activity would aim to reduce the environmental impact of dumping waste and include mechanisms to recover resources and reduce the production of waste where possible. Further discussion is provided in **Section 5.12**.
	Section 120	It is an offence to pollute any waters in NSW. This REF includes safeguards and mitigations measures to ensure the Activity does not result in pollution of waters.
Biodiversity Conservation Act 2016	Schedules 1, 2 and 3	Threatened species and communities have been assessed in accordance with the BC Act. No significant impact is expected. Refer to **Section 5.1** for further information.
Roads Act 1993	Section 138	Section 138 of the *Roads Act 1993* requires approval from the relevant road's authority for the erection of a structure, or the carrying out of work in, on or over a public road, or the digging up or disturbance of the surface of a road. Council is both the proponent and relevant roads authority in this instance.
Local Land Services Act 2013	Part 5A Land Management (native vegetation)	Provisions of the Act apply to clearing native vegetation in rural parts of the State as well as outlines clearing that is authorised under other legislation. Pursuant to Section 60O (*Clearing authorised under other legislation*) the following is applicable: *(b) Other planning authorisation – The clearing was:* *(ii) an activity carried out by a determining authority within the meaning of Part 5 of that Act after compliance with that Part, or*

Legislation	Section(s)	Comment
		(iii) authorised by an approval of a determining authority within the meaning of Part 5 of that Act granted after compliance with that Part. As the proposal is a Part 5 Activity, vegetation clearing is authorised by way of compliance with that part of the EP&A Act (this REF). No further approvals are required under the LLS Act.

3.5 Commonwealth Legislation

3.5.1 Environmental Protection and Biodiversity Conservation Act 1999

Under the EPBC Act, any action that has, or is likely to have, a significant impact on matters of national environmental significance or other aspects of the environment, such as on commonwealth land, may progress only with approval of the Commonwealth Minister for the Department of Climate Change, Energy, the Environment and Water under Part 9 of the EPBC Act.

There are no matters of national environmental significance or Commonwealth land that would be significantly impacted by the Activity. Therefore, no Commonwealth referral or approval is necessary for the Activity (refer to **Section 5.1** and **Section 7.2**).

3.5.2 Native Title Act 1993

The Activity is adjacent to the southbound lane of the existing road. A search of the National Native Title Register confirmed there is one registration for Native Title Claim by the Gomeroi People (Tribunal File No: NC2011/006/ Federal Court file no. NSD37/2019) located to the west of the Activity and adjacent to the road (refer to **Appendix C**).

Council would need to confirm whether the land tenure would require Native Title consultation to fulfil any obligations under the *Native Title Act 1993.*

3.6 Confirmation of Statutory Position

An assessment of the relevant statutory provisions and planning instruments has concluded that the Activity can be carried out as development without consent under the TISEPP and can be assessed and determined under Part 5 of the EP&A Act.

4. Consultation

4.1 Community Consultation

Letters will be issued to nearby residents, bus companies, and emergency services directly by Council. In addition, notification will be provided via social media, Council website, and Livetraffic website. Two weeks in advance of road closure, Variable Message Sign (VMS) boards will be in place to advertise of the road closure whilst the Activity is undertaken.

4.2 Transport and Infrastructure SEPP Consultation

The TISEPP aims to facilitate the effective delivery of infrastructure across the State. Part 2.2 of the TISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. However, Section 2.17(1) states (amongst other things) that other clauses in this section do not apply with respect to development that would require notice to be given to a council or public authority that is carrying out the development or on whose behalf it is being carried out.

As TRC is the proponent and determining authority for this Activity, consultation under TISEPP is not required.

4.3 Ongoing and/or Future Consultation

Internal consultation has been carried out within TRC. Direct contact with nearby residents would include a contact telephone number for any complaints/ updates associated with the Activity. Additional consultation with landowners would occur in relation to the works on private property.

5. Environmental Assessment

5.1 Biodiversity

5.1.1 Existing Environment

5.1.1.1 Desktop Review

BioNet Atlas of NSW Wildlife and Commonwealth EPBC Act Protected Matters Search Tool (PMST) database searches were completed in January 2023. BioNet searches encompassed a 20 km x 20 km grid centred on the site and PMST searches encompassed a 10 km radius on the site. The results of the searches are presented in the Biodiversity Assessment Report in **Appendix A**.

BioNet search results identified records of six threatened flora species and 12 threatened fauna species listed under the BC Act (nine of which are also listed in the EPBC Act) within the search area (refer to **Appendix A**). The search results also identified 15 Threatened Ecological Communities (TECs) listed under the BC Act (including four of which are also listed in the EPBC Act) have been recorded withing the search area.

PMST results identified potential habitat for 41 threatened species (14 flora and 27 fauna species) and six TECs within a 10 km radius of the site. The results of database searches are included in **Appendix A**.

PMST results identified 13 migratory species listed under the EPBC Act within the search area. Since the site does not comprise of important habitat, as defined by the Australian Government Department of Climate Change, Energy, the Environment and Water, for any of these species the EPBC Act listed migratory species are not considered a constraint for the Activity.

The potential for threatened species to occur within habitat at or adjacent to the site has been considered in **Appendix A**.

5.1.1.2 Site Assessment

Vegetation at the site is comprised of the Plant Community Type (PCT) Northwest White Box Woodland (PCT 3521).

This community is present in good condition, with only minimal disturbances from historic clearing, road construction.

Good condition PCT 3521 - Northwest White Box Woodland occurring at the site is not consistent with the characteristics of any TECs listed under the BC Act or EPBC Act.

A full description of the vegetation at the site is provided at **Appendix A**.

No threatened flora species listed under the BC or EPBC Act were recorded at the site. However, two threatened flora species; *Euphrasia arguta* (critically endangered) and *Thesium austral* (vulnerable) were considered as a potential occurrence at the site based on suitable habitat. Due to their cryptic nature, these species can be difficult to detect in the field (especially when not actively flowering), so an assumption was made that potential habitat for the species may be impacted by the Activity and was considered in the assessment.

One Weed of National Significance (Blackberry) listed in the National Weeds Strategy (DAW 2016) and managed under the *Biosecurity Act 2015* occurs at the site.

No threatened fauna was observed at the site. Four habitat trees were identified adjacent to the test pit locations; however, no habitat trees would be impacted by the Activity.

A full description of the fauna and habitat at the site is provided at **Appendix A**.

5.1.2 Potential Impacts

The main potential impacts of the Activity include:

- The Activity would require the removal of up to 120 m^2 (proposed removal of 30 m^2 per Test Pit site) of native shrubby woodland vegetation. Native vegetation was observed in one condition state, consisting of:
  - Good condition PCT 3521 - *Northwest White Box Woodland*
- The native vegetation removal that would be required for the Activity would also remove the potential habitat for threatened fauna including:
  - Regent Honeyeater.
  - Dusky Woodswallow.
  - Painted Honeyeater.
  - Swift Parrot.
  - Powerful Owl.
  - Scarlet Robin.
  - Flame Robin.
  - Spotted-tailed Quoll.
  - Eastern False Pipistrelle.
  - Corben's Long-eared Bat.
  - Greater Glider.
  - Squirrel Glider.
  - Koala.
  - Greater Broad-nosed Bat.

  However, tests of significance found that the Activity is unlikely to have significant impact on any BC Act or EPBC Act listed threatened fauna species (refer to **Appendix A**).
- The Activity would require the removal of native vegetation that is potential habitat for threatened - *Austral Toadflax* and *Euphrasia arguta*. However, tests of significance found that the Activity is unlikely to have a significant impact on any BC Act listed threatened flora (refer to **Appendix A**).
- General human disturbance from construction noise and human presence for fauna in the vegetation; however, this is not anticipated to be a significant impact given the nature of the works and modified nature of the site.
- Edge effects degrading habitat adjacent to the site. This impact is unlikely to be detrimental to the habitat value of adjacent habitat for a range of species given the location of the sites along the road reserve (thus subject to existing edge effects).

No hollow-bearing trees or any significant habitat features (e.g. active nests or dreys) would require removal (refer to **Appendix A**).

There is a relatively low risk of spreading noxious/ environmental weeds when disturbing the ground during construction and bringing in propagules or plant disease on vehicles/ machinery. However, this risk can be managed or minimised through implementation of safeguards and management measures.

5.1.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts relating to biodiversity:

1. The works footprint would be clearly delineated where it adjoins the PCTs and habitat trees to prevent unnecessary disturbance or accidental clearing.
2. Vegetation removal is to be kept to the minimum extent required to undertake the works.
3. All vegetation being removed would be inspected for fauna prior to clearing. If fauna are present, works would stop until the animal voluntarily vacates the site; or a spotter-catcher or ecologist would be contacted to undertake fauna capture and relocation. If threatened species are present (e.g. Koala), works would stop and an ecologist contacted to determine the most appropriate course of action.
4. Hollow-bearing trees will be identified on site and retained as a priority.
5. Should removal of habitat trees be required a spotter-catcher or ecologist will be present during trimming or felling of habitat features.
6. Species ID cards will be created and readily available in the site office for the cryptic species *Euphrasia arguta* and *Thesium austral*. Workers will be made aware of these species defining features and preferred habitat during the site induction.
7. Locations for plant parking will be selected based on minimal vegetation disturbance and locations will be inspected prior to use.
8. If unexpected threatened flora or fauna is detected, then stop works immediately and notify the TRC Project Manager who would then contact an ecologist to determine the most appropriate course of action.
9. Contact an animal rescue agency/ wildlife care group or vet in the event that native fauna are injured. WIRES Central Northern: 1300 094 737.
10. Trees would be directionally felled away from adjacent intact vegetation to avoid unnecessary damage.
11. Ensure all plant, equipment and personnel are free of soil and potential weed propagules prior to being brought to the site or leaving the site, in accordance with the *Saving Our Species Hygiene Guidelines* (DPIE, 2020).

5.2 Aboriginal Heritage

5.2.1 Existing Environment

The Activity would be located within the TLALC area. An Aboriginal Cultural Heritage (Due Diligence) Assessment was undertaken for the test pit sites (refer to **Appendix D**). Tim Hill from Heritage Management & Planning undertook a site inspection with Uncle Don Fermor from TLALC on Friday 3 February 2023.

5.2.2 Potential Impacts

Based on the Aboriginal Cultural Heritage (Due Diligence) Assessment prepared by Heritage Management & Planning and with consideration of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects* (DECCW 2010) it has been determined that the proposed geotechnical test pits will not likely impact on Aboriginal cultural sites within the area of the Activity. An overview of the application of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects* is presented at **Table 5.1**.

Table 5.1 Due Diligence Code of Practice for the Protection of Aboriginal Objects

Step		Comment
1	Will the activity disturb the ground surface? Disturbed land is defined under the code as: *Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable.* *Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks.*	The Activity would involve disturbing and removing the ground surface on the embankment above the road surface along the southbound lane. The road reserve and steep terrain would likely have been subject to disturbance due to the maintenance and management of the road for over a century (refer to **Appendix D**).
2a	AHIMS database	As part of the Aboriginal Cultural Heritage (Due Diligence) Assessment, an AHIMS search was undertaken for the site. The search identified three (3) previously recorded sites within close proximity of the Activity. However, the closest site, being a potential scar tree at the intersection of Nowendoc Road and Weabonga Road, is approximately 835 m north of the most northern test pit location and will not be affected by the Activity (refer to **Appendix D**).
2b	Is the activity: ▪ within 200 m of waters ▪ located within a sand dune system ▪ located on a ridge top, ridge line or headland ▪ located within 200 m below or above a cliff face ▪ within 20 m of or in a cave, rock shelter, or a cave mouth ▪ is on land that is not disturbed land. If after completing steps 2a and 2b it is reasonable to conclude that there are no known Aboriginal objects or a low probability of objects occurring in the area of the proposed activity, you can proceed with caution without applying for an AHIP.	The test pit sites do not cross any waterways and are immediately adjacent to the existing road. During the Aboriginal Cultural Heritage site visit by Uncle Don it was noted that the rock located off the steep ridge is of not good quality and not suited to the production of stone tools. Therefore, the site is assessed as having a low probability of objects occurring in the area of the Activity (refer to **Appendix D**). As such, an Aboriginal Heritage Impact Permit (AHIP) is not required.
3	Can you avoid harm to the object or disturbance of the landscape feature?	No objects or landscape features identified within the area of the Activity.

Step		Comment
4	Desktop assessment and visual inspection	The Activity area consists of the existing road reserve and adjacent steep rocky slopes that would have been subjected to repeated maintenance and management for over a century (refer to **Appendix D**). It is not expected that any items of Aboriginal heritage would be disturbed.
5	Further investigations and impact assessment	The Aboriginal Cultural Heritage (Due Diligence) Assessment concludes that additional archaeological excavation is not required for the Activity as there is an overall low likelihood that Aboriginal sites will occur within the road reserve and adjacent steep rocky slopes (refer to **Appendix D**)**.**

It is highly unlikely that any unidentified Aboriginal heritage items are located within the Activity footprints. Safeguards are provided to ensure any unexpected Aboriginal heritage items uncovered during the Activity are not impacted (refer to **Section 5.2.3**).

It is not anticipated that the Activity would have any impact on Aboriginal heritage items listed under the *National Parks and Wildlife Act 1974* (NPW Act).

5.2.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts to any items of Aboriginal heritage:

12. All personnel working on site will be inducted and receive information on the required process, should a potential Aboriginal object be found.
13. Unexpected Aboriginal objects remain protected by the NPW Act. If any such objects, or potential objects, are uncovered in the course of the activity, work in the vicinity must cease, and Heritage NSW, and T LALC be contacted for advice.
14. If suspected Aboriginal objects have been uncovered as a result of construction within the Activity area, the following actions must be undertaken:

    a. Work in the surrounding area is to stop immediately and records are made of the finds via project incident reporting procedures;
    b. A temporary fence is to be erected around the site and appropriate controls put in place to ensure that no additional ground disturbance happens in the vicinity of the find;
    c. An appropriately qualified archaeological consultant and a representative of the Tamworth LALC are to be engaged to identify the material and provide an initial assessment of the significance of the object and the likely nature and extent of any associated archaeological sites;
    d. If the material is found to be of Aboriginal origin, the find must be reported on the AHIMS database;
    e. In the event that the aboriginal objects are considered to have been damaged or disturbed, the incident must be reported through the NSW Environment hotline, and

f. Works may only recommence after advice from Heritage NSW on the requirement for an AHIP or where design, engineer or construction measures are identified to mitigate further damage to the Aboriginal site.

15. If suspected human remains are discovered and/or harmed in, on or under the land within the Activity area, the following actions must be undertaken:

a. The remains must not be harmed/further harmed.
b. Immediately cease all works at that particular location.
c. Secure the area so as to avoid further harm to the remains.
d. Notify the nearest Police Station (Tamworth), the TLALC and the Heritage NSW (Parramatta) as soon as practicable and provide any details of the remains and their location.
e. If the remains are found to be of Aboriginal origin and the police do not wish to investigate the site for criminal activities, the Aboriginal community and the Heritage NSW should be consulted as to how the remains should be dealt with.
f. Do not recommence any work at the Activity site until after an agreement is reached between all parties, provided it is in accordance with all parties' statutory obligations.

5.3 Non-Aboriginal Heritage

5.3.1 Existing Environment

A search of the Tamworth Regional LEP 2010 identifies Port Stephens Cutting as a local heritage item I264. As detailed in the Preliminary Heritage Advice letter by Eureka Heritage (refer to **Appendix B**), this heritage item refers to the hand laid stone wall, which is a dry-stone retaining wall that supports large sections of the roadway on the downward slope along the northbound lane.

During the site inspection conducted by Eureka Heritage, nine culvert outlets were observed within the stone wall, a majority of which had been piped with concrete inserts. One stone inlet was identified approximately 100 m south of the test pit 1 location. Other stone culvert inlets were difficult to locate and are assumed to be obscured with overgrowth or infilled with sediment. There is a potential for structural remnants of the original stonework of culverts to remain beneath the road surface. In a number of locations, the bank along the southbound lane was observed to have previously collapsed and been cleared and at most of these locations the stone retaining wall had been disturbed/ covered. Despite the obscured upper courses of stonework, it is likely that the stonework remains intact beneath.

5.3.2 Potential Impacts

The Activity would require excavation works to occur on the upward slope along the southbound lane, on the opposite side of the road to the stone retaining wall heritage item. As such, it is of very low likelihood that the excavations would result in any direct adverse impact on the dry-stone retaining walls along the northbound lane of the roadway, however, there is a potential for culvert inlets to be encountered along the southbound lane. The wall stonework has survived for at least 170 years despite the regular use of the road by heavy vehicles and the repair and maintenance of the roadway. Therefore, it is considered any impact from the potential indirect impact from vibration or inadvertent impact by mechanical excavation to be very unlikely (refer to **Appendix B**).

Safeguards and mitigation measures are provided to ensure the heritage item and any heritage items uncovered during the Activity are not significantly impacted (refer to **Section 5.3.3** below). Should advice for management of a suspected work or relic be required, it is usually possible to manage via telephone, photographs and email. However, a site visit might be required in order to accurately make an assessment and formulate a management approach.

It is not expected that the Activity would have any impact on any heritage items listed under the *Heritage Act 1977* or by any State or Local Government agency.

5.3.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts to any items of non-Aboriginal heritage:

16. All personnel working on site will be inducted and advised of the presence and significance of the dry-stone retaining walls along the northbound lane and the suspected presence of overgrown or sediment filled culvert inlets along the southbound lane. Additionally, all personnel will be made aware of the potential for the presence of dry-stone walls and culverts within close proximity of the test pit sites. Some sections of stone wall may be obscured at the road level but still exist below.
17. All personnel working on site will receive information on the required process should a suspected work or relic be found.
18. If any suspected archaeological items are uncovered during works associated with the Activity, all works will cease in the vicinity of the material/ find. Contact with Council and Heritage NSW will be made immediately. Works will not recommence until clearance is given.
19. Excavated material to be removed from the site is not to be disposed of through pushing over the western edge of the roadway.
20. Prior to commencement of excavation, the area will be inspected for stonework of culvert inlets. In the event the stonework is found, if possible, the test pit location will be moved by a few metres to avoid.
21. Site personnel will take care to avoid damaging any remnant stonework along both eastern and western alignments of the roadway.
22. Site personnel will take a photographic record of the test pits to be provided to the heritage consultant.
23. In the event that advice for management of a suspected work or relic is required, a heritage specialist is to be engaged.
24. Locations for plant parking will be inspected for evidence of culvert inlets prior to use and any suspected stonework is to be avoided.

5.4 Visual

5.4.1 Existing Environment

The existing environment of the Port Stephens Cutting is a steep slope within a high rolling plateau terrain and is mapped as part of the Niangala Plateau and Slopes. The existing road runs through a heavily vegetated area with pockets of agricultural grazing land. Occasional views of the adjacent grazing land and into the valley below occur along Port Stephens Cutting, particularly towards the northern, upper section of the road. The quality of the visual environment associated with the Activity area is high with value at a local scale.

The existing road identified locally as Port Stephens Cutting is approximately 5 km in length and is narrow and windy, with many turns in the road.

5.4.2 Potential Impacts

The Activity would be limited to the four test site locations, with work related to the excavation of these areas to test for material suitability and assess construction methodology. During construction there would be minor visual impacts associated with the presence of construction equipment and construction site activities. However this would be temporary and short term. Following construction, the test pit locations would result in visual impacts associated with widened road sections adjacent to

the road. The exposed rock would be in contrast with the vegetative covering associated with the road embankment. The visual impacts on these sections would be considered temporary and short term as they would only remain until the main works commence.

The Activity would result in a negligible negative visual impact to local residents and users of Port Stephens Cutting due to the contrast in exposed rock versus the current vegetated state. However, this visual impact would be isolated to the four test pits and is expected to be a short-term impact, only remaining for several months until the main construction works of the road widening begin. Where possible, the exposed side of the embankment as a result of the excavation should be left in a sloping manner and similar to the existing slope to either side. The temporary visual impact would be reduced with the implementation of appropriate safeguards and mitigation measures.

5.4.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented to prevent and/ or minimise adverse impacts relating to visual amenity:

25. Provide clear and regular information to local residents about the duration and times of day that construction works will be occurring. Contact details of the assigned community liaison officer will also be provided.
26. Any potentially impacted parties or landholders will be consulted prior to construction with a goal of minimising or eliminating any adverse impacts.
27. Vegetation will only be cleared to the minimum extent necessary to undertake the proposed works.
28. Soil disturbance will be minimised where possible.
29. Upon completion of the works, all work areas will be left tidy and at an acceptable visual state.
30. All work areas will be maintained, kept free of rubbish, and cleaned up at completion.
31. In the event the main works are delayed to a longer term or cancelled, the test pit locations and all work areas will be restored to an acceptable visual state with the indefinite time frame in mind.

5.5 Soils and Contamination

5.5.1 Existing Environment

The topography of the site is generally steep in a high rolling plateau terrain and is mapped as part of the Niangala Plateau and Slopes. eSpade mapping is not available for the site, however, a soil profile on Nowendoc Road, approximately 740 m north east of the upper point of the Activity, identifies the surface condition as hard set, the profile drainage as imperfectly drained, erosion hazard as slight, and no evident salting. Refer to **Appendix E** for Soil Profile.

A review of New South Wales Planning Portal acid sulphate soil risk mapping determined that the site of the Activity does not contain Acid Sulphate Soils.

Online contamination searches were undertaken for the site on 8 March 2023 including the Environmental Protection Authority (EPA) Contaminated Land and the Department of Primary Industries (DPI) Dip Site locator. The searches did not identify any cattle dip sites or other registered contamination items within or adjacent to the Activity. Refer to **Appendix F** for results of the contaminated land search.

5.5.2 Potential Impacts

There are no cattle dip sites located in close proximity to the Activity site and it is considered unlikely they would occur at the Activity locations. However, safeguards would be in place should unexpected contamination be encountered during the works.

With the exposed rock and soil as a result of the Activity being left on site for a period of time, erosion and sediment runoff could enter the surrounding environment and waterways. Safeguards and mitigation measures, in accordance with the “Bluebook” (Landcom 2004) would be put into place to direct runoff to appropriate locations and reduce the risk of sediment laden water entering any water courses.

5.5.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts relating to soils and contamination:

32. Erosion and sediment controls will be implemented in accordance with the Landcom/ Department of Housing *Managing Urban Stormwater, Soils and Construction Guidelines* (the Blue Book) and will be maintained to prevent sediment moving off-site and sediment laden water entering any water course during the construction process.
33. A site-specific erosion and sediment control plan will be developed, approved and implemented prior to commencement of the works.
34. Works will only commence once all erosion and sediment controls have been established. The controls will be maintained in place until the works are complete and all exposed erodible materials are stabilised.
35. If unexpected contaminated land is encountered during the works, works will stop immediately, and relevant procedures outlined in a Construction Environmental Management Plan (CEMP) will be followed. The EPA will be notified immediately in response to incidents causing or threatening actual or potential harm to the environment in accordance with section 148 of the *Protection of the Environment Operations Act 1997* (POEO Act) (via EPA Environment Line on 131 555).
36. Only clean equipment and vehicles will be used, with equipment being cleaned down before being brought to the site.
37. A site-specific erosion and sediment control plan that addresses the period between the early works and the main works will be developed, approved, and implemented prior to construction finishing. This is to address and control for any exposed loose soil as a result of the excavation and will include measures such as the use of Geofabric or Erosion Control Blankets to be placed at the test pit sites until the main works commence.
38. Once construction is complete, a management plan will be put into place for the regular monitoring of the excavated test pit sites and regular inspections of sediment control measures that will be left in place until the main works begin.

5.6 Water Quality

5.6.1 Existing Environment

The Activity site is located along a steep slope cutting surrounded by a heavily vegetated area with pockets of rural agricultural land. The test pit locations are not situated in areas that are crossed by any tributaries or waterways.

Test pit 1 sits approximately 90 m north of an unnamed second order tributary that crosses the road and test pit 2 sits approximately 40 m south of an unnamed first order tributary. Test pits 3 and 4 are not in close proximity to where tributaries cross Port Stephens Cutting.

Dungowan Creek runs in parallel with Ogunbil Road and Dungowan Dam Road and is located approximately 1.7 km southwest of Test Pit 1.

5.6.2 Potential Impacts

The Activity could present risks to nearby waterways and any downstream environments if not managed effectively. Construction activities that could present a risk to sensitive environments in the broader landscape include:

- Erosion and sediment disturbance that could disperse from the works site and impact local drainage lines, nearby waterways such as Dungowan Creek.
- Turbidity and sedimentation of local aquatic habitats and waterways.
- Pollution of local water quality (both ground and surface water) from pollutants from machinery and construction materials and spills.
- A variety of dispersible liquid materials would be used which pose a potential pollutant threat to local water quality. These liquids include, but are not limited to, diesel, unleaded petrol, machinery oils and lubricants. The nature of these liquids and their ability to disperse away from the work site means that they could have a negative impact on ground or surface water on or adjacent to the site, especially during rain.
- Periods of high rainfall or flood could exacerbate potential water quality impacts if works are in progress during such an event.

Whilst the works could pose these risks, they are unlikely if appropriate safeguards and mitigation measures are implemented.

5.6.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts relating to water quality:

39. Works will avoid forecast high rainfall events and works will be planned to occur during a period of no or low flow.
40. A spill containment kit will be available during the works. All personnel will be made aware of the location of the kit and trained in its effective deployment.
41. Any required fuels and other liquids will be stored in self-safe chemical storage containers.
42. If required, all refuelling of plant and equipment will be in appropriately designated areas away from drainage lines or watercourses (at least 40 m) and managed in order to prevent any potential spills leaving the refuelling area (e.g., use of bunded areas).
43. Cleaning or washing will not occur near waterways or drainage lines.
44. All equipment will be maintained in good working order and operated according to manufacturer's specification.
45. No waste and/ or wastewater will be discharged directly or indirectly in waterways.
46. If small amounts of groundwater are encountered as a result of excavations, it will be pumped out and discharged to the surrounding area via controls including a silt fence and turkeys nest.
47. Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/ slicks) within construction site and adjacent area will be undertaken on a regular basis to identify any potential spills or deficient erosion and sediment controls during construction.
48. The Council and EPA will be notified immediately in response to incidents causing or threatening actual or potential harm to the environment in accordance with section 148 of the POEO Act (via EPA Environment Line on 131 555).

5.7 Bushfire

5.7.1 Existing Environment

According to the NSW Government's ePlanning Spatial Viewer (NSW Government, 2022), the site is mapped as containing mostly Vegetation Category 1 and partly as Vegetation Category 3 (refer to **Figure 5.1**). Most of the adjoining land also consists of Categories 1 and 3, with Category 1 areas to the east and west directions, and Category 3 areas to the north and south directions.

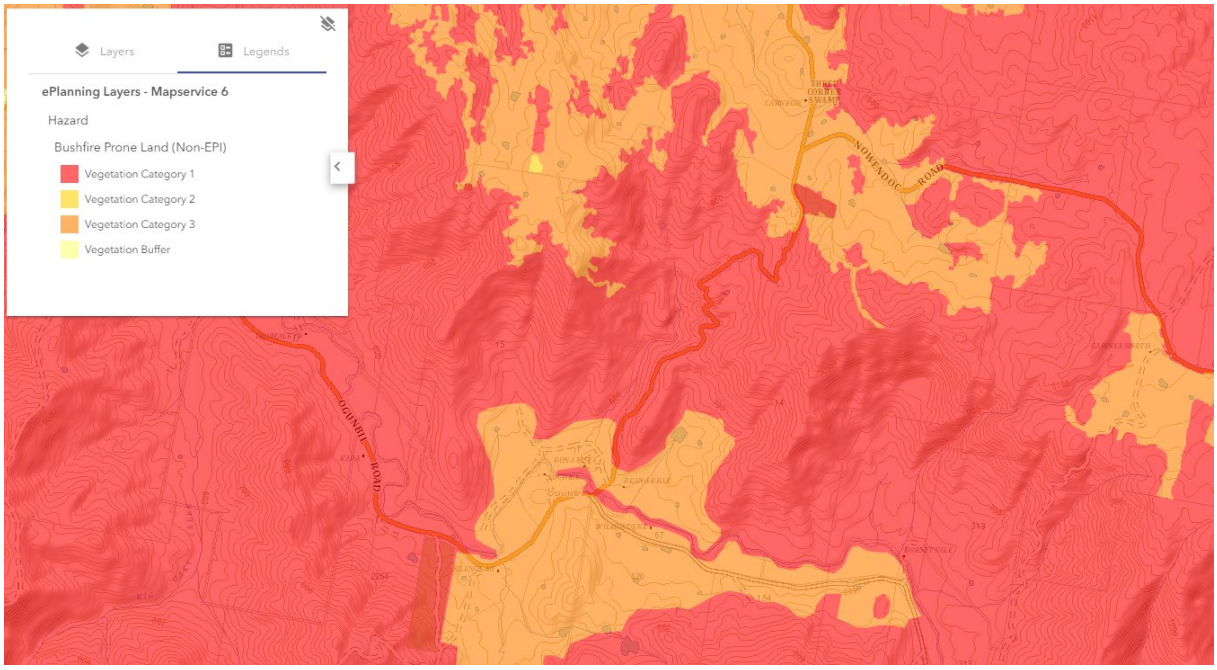


Figure 5.1 Bushfire zones around Port Stephens Cutting.
Map sourced from NSW ePlanning Spatial View 2023.

5.7.2 Potential Impacts

Given the site context and the nature of the Activity, the expected risk from bushfire is considered relatively minor. Evacuation routes via established roads would be utilised in an emergency situation.

The Activity is not a Special Fire Protection Purpose and does not require a bushfire safety authority under Section 100B of the *Rural Fires Act 1997*. The Activity is not considered to increase bushfire risk.

5.7.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts relating to bushfire:

49. Works that are likely to cause a fire, such as general purpose hot works (welding, grinding or gas cutting), or any activity that is likely to produce a spark or flame are not to be carried on days with an elevated fire danger or a total fire ban in effect.
50. A fire extinguisher will be available on machinery for quick response if ignition occurs. All personnel will be made aware of the location of the extinguisher and trained in its effective deployment.

51. The contractor/ site manager is to maintain awareness of bushfire emergency information, in particular during a bushfire danger period, and be aware of all current bushfire alerts in the wider vicinity of the Activity area.

5.8 Noise and Vibration

5.8.1 Existing Environment

The Activity site are located in a vegetated and rural landscape. The majority of sensitive receivers within proximity of the Activity are situated at the southern end of Port Stephens Cutting, close to the intersection with Ogunbil Road. One sensitive receiver is situated at the northern end of Port Stephens Cutting, along Weabonga Road approximately 425 m north of the intersection.

The Activity would be undertaken at four test pit sites along Port Stephens Cutting, with the most southern test pit located approximately 1.8 km northeast of the intersection with Ogunbil Road and the most northern test pit located approximately 850 m south of the intersection with Weabonga Road. Therefore, all sensitive receivers are further than 1 km from the Activity sites.

5.8.2 Potential Impacts

Noise from the Activity would be typical of that associated with excavation road works and would be generated by machinery, equipment, and vehicles. This would result in noise and possible vibrations within the immediate area. Considering the steep slope of the terrain, the heavy vegetation, the numerous bends in the road, and the distance from the Activity sites, it is unlikely the sensitive receivers would be impacted by noise or vibration. As the Activity is only expected to take one day to complete, any noise and vibration impacts would be short-term and temporary.

Safeguards and mitigation measures would aid in managing any possible impacts.

5.8.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to avoid and minimise any potential adverse impacts relating to noise and vibration:

52. Construction activities will be undertaken in accordance with EPA recommended standard construction hours:

    - Monday to Friday 7:00 am to 6:00 pm.
    - Saturday 8:00 am to 1:00 pm.
    - No work on Sundays or public holidays.

53. Where practicable, noise control should occur at the source and modifications to noise control should be investigated and implemented, such as sourcing low noise power tools or hydraulic or electrically controlled equipment instead of petrol or pneumatic equipment.
54. Any noise complaints will be recorded and include suitable identification/ description of the noise source (e.g. continual/ impulsive) and general location of the complaint. Any noise complaints will be investigated and actioned as required.
55. The most appropriately sized tool for the respective job will be used, keeping in mind that the smaller the tool, the less potential noise generated.
56. All vehicles and equipment will be turned off and not left idling when not required for work uses.
57. All plant will be fitted with appropriate exhaust systems to ensure compliance with pollution and noise emission standards.

5.9 Traffic and Access

5.9.1 Existing Environment

The Port Stephens Cutting section of Nowendoc Road is located between the intersections with Ogunbil Road and Weabonga Road. The road is a narrow, two lane, sealed regional road with a speed limit of 80 km/h. The road is managed by TRC.

5.9.2 Potential Impacts

Nowendoc Road section known as Port Stephens Cutting would be closed for three days to accommodate the Activity. Advanced notice of no less than two weeks would be provided to local residents and through TRC information and social networks. A site-specific traffic guidance scheme (TGS) would be developed and implemented for the works and VMS boards would be placed in advance of the works to notify drivers of the future and current closure of the road. Traffic control measures would be in place with traffic control teams located at the top and bottom of Port Stephens Cutting. Local traffic would be allowed to pass as required under traffic control and no access to local residential properties would be affected by the road closure. The impact to drivers would be due to slower travel time, however, due to the short timeframe and low usage of the road, this is considered to be of minimal impact.

Heavy vehicle movements would be required and would primarily be associated with the transportation of construction materials and equipment. Construction activities would occur during the day within standard working hours and is expected to only last several days. The road would be closed and all works would be undertaken under an approved Traffic Control Plan (TCP). The road would be made safe and re-opened at the end of the work day and for overnight.

5.9.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts relating to traffic and access:

58. All works will be undertaken under an approved Traffic Control Plan (TCP) prepared in accordance to TRC *C201 – Control of Traffic Specification* (TRC, 2019), including, but not limited to, management of the road closure and local traffic.
59. Local traffic movements, including private driveway access, will be maintained during the works through the use of traffic control measures.
60. Advanced warning signage will be established at appropriate and strategic locations as per the TGS, prior to and during the work to ensure road users and pedestrians are made aware of changed traffic/ access conditions.
61. All traffic closures/ disruptions/ changed road conditions would be communicated to road users in accordance with Council via suitable means/ media, including use of, but not limited to, letters, social media, Council website, Livetraffic website, and VMS boards.

5.10 Air Quality

5.10.1 Existing Environment

The Activity is located in a vegetated and rural setting. Potential airborne particles within the locality are largely restricted to vehicle emissions and minor dust generated by vehicle movements and agricultural activities in the broader landscape.

5.10.2 Potential Impacts

The Activity may temporarily affect air quality through exhaust emissions from machinery and dust generated during excavation works and earthworks. There is a potential that emissions and dust generated from the works may result in air quality impacts in the local area, however, due to the steep sloped terrain and vegetation, it is unlikely that emissions and dust would reach the properties of sensitive receivers, the closest being located more than 1 km away. No long-term impacts associated with the exposed test pits are anticipated as they are temporary in nature until the main works on Port Stephens Cutting commences. Potential impact is not considered significant and can be managed or minimised through implementation of safeguards and management measures.

The Activity would contribute to greenhouse gas emissions to a minor extent via the emissions from construction equipment and traffic, as well as the consumption of materials requiring carbon emissions. Given the scale and duration of the works, however, the influence on greenhouse gas emissions would be negligible. However, it is appropriate to implement measures that can reduce or minimise such effects.

5.10.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts relating to air quality:

62. Vegetation or other materials will not be burnt on-site.
63. Vehicles transporting waste or other materials that may produce odours or dust will be covered during transportation.
64. Construction works will not be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.
65. Machinery and vehicles not in use during construction will be turned off and not left to unnecessarily run idle.
66. Vehicles, machinery, and equipment will be maintained in accordance with manufacturer's specifications in order to meet the requirements of the POEO Act and associated regulation.
67. Dust suppression techniques would be utilised to minimise the potential for dust generation/ dispersal during works, as required.
68. If required for dust suppression in the interim prior to the main works commencing, the exposed areas of soil as a result of the excavation works will be covered with Geofabric or Erosion Control Blankets.

5.11 Socio-economic

5.11.1 Existing Environment

Port Stephens Cutting is situated in a vegetated, rural area with pockets of agricultural land. The Activity would be located adjacent to the existing road. The majority of sensitive receivers within proximity of the Activity are situated at the southern end of Port Stephens Cutting, close to the intersection with Ogunbil Road, with one sensitive receiver is situated at the northern end of Port Stephens Cutting. All sensitive receivers are further than 1 km from the Activity sites.

5.11.2 Potential Impacts

The Activity would require the closure of Port Stephens Cutting for a day while the excavation occurs. However, due to the locations of the excavations being at the side of the road, the road itself would not be impacted and local traffic would be allowed to pass through. Access to the road will be restricted by traffic control measures and the resulting in short-term negative impacts to road users as delays to

travel time. Refer to **Section 5.9** for detailed potential impacts and safeguards and mitigation measures related to traffic.

No property acquisition or property adjustment works would be required to enable the Activity. Additionally, no private property access is required.

Given the nature of the Activity, the site context, and short-term construction period, no adverse long-term socio-economic impacts are anticipated.

5.11.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse social impacts:

69. Contractors/ workers will be mindful of the needs of the local community.
70. Any potentially impacted parties or landholders will be consulted prior to construction with a goal of minimising or eliminating any adverse impacts.
71. Local residents will be provided with a contact number for lodging complaints. Complaints will be addressed by Council in a timely manner.

5.12 Waste

5.12.1 Existing Environment

The Activity is located adjacent to a section of Nowendoc Road locally known as Port Stephens Cutting. There may be some general rubbish discarded by road users within the area.

5.12.2 Potential Impacts

The Activity would be undertaken to ensure minimal impacts are generated from waste produced on-site by ensuring that all waste is managed appropriately. Waste generated from the Activity may include, but is not limited to:

- Packaging materials.
- General site rubbish.
- Oils and grease from machinery.
- Soil and rock spills.
- Vegetation removal.

Waste has the potential to disperse into the surrounding environment and cause potential harm to stock and terrestrial and aquatic flora and fauna. Waste products may also transport contaminants that may degrade local water quality (e.g. fuels, lead-based paint, and oils). This risk can be reduced and managed through the implementation of safeguards.

5.12.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts in relation to waste generated by the Activity:

72. Working areas will be maintained, kept free of rubbish, and cleaned up at the end of the day.
73. Resource management hierarchy principles are to be followed:

    - Avoid unnecessary resource consumption as a priority.

- Avoidance is followed by resource recovery (including re-use of materials, reprocessing, recycling, and energy recovery).
- Disposal is undertaken as a last resort.

74. Waste material will not be left on-site once the works have been completed.
75. Any contaminated waste generated will be disposed of in accordance with the EPA approved methods of waste disposal.
76. Waste will be disposed of at a licensed waste or recycling facility as appropriate.
77. Material generated from tree removal is to be mulched on-site and taken to a licenced waste facility.

5.13 Climate Change

5.13.1 Existing Environment

Anthropogenic climate change associated with global warming is the result of human activities creating greenhouse gas emissions which in turn affects the environment. Anthropogenic climate change and the need to reduce emissions is a key issue of global, national, and local importance.

5.13.2 Potential Impacts

The Activity would contribute to carbon emissions and anthropogenic climate change to a minor extent via the production of greenhouse gas emissions by construction equipment and traffic as well as the consumption of materials requiring carbon emissions and the potential removal of trees and vegetation that may otherwise act as a carbon sink. Given the scale of the works the influence on emissions and climate change would be negligible. However, it is appropriate to implement measures that can reduce or minimise cumulative emissions and related effects.

5.13.3 Safeguards and Mitigation Measures

The following safeguards and mitigation measures will be implemented in order to prevent adverse impacts in relation to climate change:

78. Vehicles and equipment will be switched off when not required for direct construction activities.
79. Waste will be minimised and is otherwise to be recycled or disposed of appropriately.
80. Vegetation removal will be minimised as far as practical.

5.14 Cumulative Impacts

Under Section 171 of the EP&A Regulation 2021, any cumulative environmental effect with other existing or likely future activities must be taken into account when assessing the impact of an activity for the purposes of Part 5 of the EP&A Act.

The Activity is expected to add to a number of cumulative impacts including resource consumption, vegetation clearing and generation of greenhouse gas emissions (e.g. through operation of vehicles and equipment, use of resources). However, the mitigation measures stated throughout **Section 5** and the methodology for completion of the Activity aim to minimise the extent to which it contributes to cumulative adverse environmental impacts.

There are no other known significant developments or works that would coincide with the Activity and have the potential to result in adverse cumulative amenity and environmental impacts. As such, no significant cumulative impacts are expected.

5.15 Ecologically Sustainable Development

The objectives of the EP&A Act require that the principles of ecologically sustainable development are considered and evaluated in the environmental assessment process and in the determination of a development application. Whilst a development application is not required for this project, consideration of these principles is useful.

5.15.1 Precautionary Principle

The EP&A Regulation 2021 defines the precautionary principle as the following:

> *If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*

To satisfy the precautionary principle, this REF has conducted a thorough analysis of potential environmental, economic, and social concerns. This assessment has identified and examined potential impacts and developed appropriate mitigation measures and safeguards to help avoid and/or minimise impacts and safeguard the environment. Considering this assessment's findings, the Activity is unlikely to impose significant and/or long-term adverse impacts on the environment, economy, or community. The mitigation measures and safeguards outlined in this REF would be implemented to ensure sound environmental outcomes in all aspects of the Activity.

5.15.2 Intergenerational Equity

The EP&A Regulation 2021 defines the inter-generational equity as the following:

> *That the present generation should ensure that the health, diversity, and productivity of the environment are maintained or enhanced for the benefit of future generations.*

The Activity would not significantly affect the viability of threatened species, or any TECs or other environmental resources including water, soil, and air. Therefore, local environmental values would not be substantially adversely affected by the Activity and would be maintained for future generations.

5.15.3 Conservation of Biological Diversity and Ecological Integrity

The EP&A Regulation 2021 defines the conservation of biological diversity and ecological integrity as the following:

> *That conservation of biological diversity and ecological integrity should be a fundamental consideration.*

The impacts to ecological integrity and conservation of biological diversity at the site have been assessed as part of this REF. No threatened species, endangered populations or TECs are likely to be significantly affected by the Activity. No populations of native species are likely to be made locally rare or unviable as a result of the Activity. Consequently, the ecological integrity and biological diversity would be maintained locally.

5.15.4 Improved Valuation, Pricing, and Incentive Mechanisms

The EP&A Regulation 2021 defines improved valuation, pricing, and incentive mechanisms as the following:

> *That environmental factors should be included in the valuation of assets and services.*

It is difficult, however, to assign a monetary value to the environment of a locality or to environmental resources not considered for commercial use. The proponent has taken an approach to manage the potential environmental impacts of the Activity by identifying appropriate measures and safeguards to avoid or mitigate adverse environmental effects. This would ensure that the integrity of the environment is not degraded, is managed and where possible enhanced.

6. Environmental Management

The following table provides a summary of the mitigation measures and safeguards detailed in this report that would be implemented for the Activity. The identified measures would be incorporated by the Contractor into a CEMP prior to commencement of works, which also outlines how risks would be minimised and the construction processes would be undertaken and managed.

The objective of the CEMP is to outline parameters for site management practices during construction. All construction staff and site personnel would be inducted and made aware of their obligations working on the project, their environmental responsibilities, and the safeguard measures to avoid and minimise potential impacts. Induction and toolbox talks would commence early in the program and continue as new personnel/contractors are engaged.

Table 6.1 **Summary of Safeguards and Mitigation Measures**

Environmental Attribute	Safeguards/ Mitigation Measures
Biodiversity	1. The works footprint would be clearly delineated where it adjoins the PCTs and habitat trees to prevent unnecessary disturbance or accidental clearing. 2. Vegetation removal is to be kept to the minimum extent required to undertake the works. 3. All vegetation being removed would be inspected for fauna prior to clearing. If fauna are present, works would stop until the animal voluntarily vacates the site; or a spotter-catcher or ecologist would be contacted to undertake fauna capture and relocation. If threatened species are present (e.g. Koala), works would stop and an ecologist contacted to determine the most appropriate course of action. 4. Hollow-bearing trees will be identified on site and retained as a priority. 5. Should removal of habitat trees be required a spotter-catcher or ecologist will be present during trimming or felling of habitat features. 6. Species ID cards will be created and readily available in the site office for the cryptic species *Euphrasia arguta* and *Thesium austral*. Workers will be made aware of these species defining features and preferred habitat during the site induction. 7. Locations for plant parking will be selected based on minimal vegetation disturbance and locations will be inspected prior to use. 8. If unexpected threatened flora or fauna is detected, then stop works immediately and notify the TRC Project Manager who would then contact an ecologist to determine the most appropriate course of action. 9. Contact an animal rescue agency/ wildlife care group or vet in the event that native fauna are injured. WIRES Central Northern: 1300 094 737. 10. Trees would be directionally felled away from adjacent intact vegetation to avoid unnecessary damage. 11. Ensure all plant, equipment and personnel are free of soil and potential weed propagules prior to being brought to the site or leaving the site, in accordance with the *Saving Our Species Hygiene Guidelines* (DPIE, 2020).
Aboriginal Heritage	12. All personnel working on site will be inducted and receive information on the required process, should a potential Aboriginal object be found. 13. Unexpected Aboriginal objects remain protected by the NPW Act. If any such objects, or potential objects, are uncovered in the course of the activity, work in the vicinity must cease, and Heritage NSW, and T LALC be contacted for advice. 14. If suspected Aboriginal objects have been uncovered as a result of construction within the Activity area, the following actions must be undertaken:

Environmental Attribute	Safeguards/ Mitigation Measures
	a. Work in the surrounding area is to stop immediately and records are made of the finds via project incident reporting procedures; b. A temporary fence is to be erected around the site and appropriate controls put in place to ensure that no additional ground disturbance happens in the vicinity of the find; c. An appropriately qualified archaeological consultant and a representative of the Tamworth LALC are to be engaged to identify the material and provide an initial assessment of the significance of the object and the likely nature and extent of any associated archaeological sites; d. If the material is found to be of Aboriginal origin, the find must be reported on the AHIMS database; e. In the event that the aboriginal objects are considered to have been damaged or disturbed, the incident must be reported through the NSW Environment hotline, and f. Works may only recommence after advice from Heritage NSW on the requirement for an AHIP or where design, engineer or construction measures are identified to mitigate further damage to the Aboriginal site. 15. If suspected human remains are discovered and/or harmed in, on or under the land within the Activity area, the following actions must be undertaken: a. The remains must not be harmed/further harmed. b. Immediately cease all works at that particular location. c. Secure the area so as to avoid further harm to the remains. d. Notify the nearest Police Station (Tamworth), the TLALC and the Heritage NSW (Parramatta) as soon as practicable and provide any details of the remains and their location. e. If the remains are found to be of Aboriginal origin and the police do not wish to investigate the site for criminal activities, the Aboriginal community and the Heritage NSW should be consulted as to how the remains should be dealt with. f. Do not recommence any work at the Activity site until after an agreement is reached between all parties, provided it is in accordance with all parties' statutory obligations.
Non-Aboriginal Heritage	16. All personnel working on site will be inducted and advised of the presence and significance of the dry-stone retaining walls along the northbound lane and the suspected presence of overgrown or sediment filled culvert inlets along the southbound lane. Additionally, all personnel will be made aware of the potential for the presence of dry-stone walls and culverts within close proximity of the test pit sites. Some sections of stone wall may be obscured at the road level but still exist below. 17. All personnel working on site will receive information on the required process should a suspected work or relic be found. 18. If any suspected archaeological items are uncovered during works associated with the Activity, all works will cease in the vicinity of the material/ find. Contact with Council and Heritage NSW will be made immediately. Works will not recommence until clearance is given. 19. Excavated material to be removed from the site is not to be disposed of through pushing over the western edge of the roadway. 20. Prior to commencement of excavation, the area will be inspected for stonework of culvert inlets. In the event the stonework is found, if possible, the test pit location will be moved by a few metres to avoid. 21. Site personnel will take care to avoid damaging any remnant stonework along both eastern and western alignments of the roadway. 22. Site personnel will take a photographic record of the test pits to be provided to the heritage consultant. 23. In the event that advice for management of a suspected work or relic is required, a heritage specialist is to be engaged.

Environmental Attribute	Safeguards/ Mitigation Measures
	24. Locations for plant parking will be inspected for evidence of culvert inlets prior to use and any suspected stonework is to be avoided.
Visual	25. Provide clear and regular information to local residents about the duration and times of day that construction works will be occurring. Contact details of the assigned community liaison officer will also be provided. 26. Any potentially impacted parties or landholders will be consulted prior to construction with a goal of minimising or eliminating any adverse impacts. 27. Vegetation will only be cleared to the minimum extent necessary to undertake the proposed works. 28. Soil disturbance will be minimised where possible. 29. Upon completion of the works, all work areas will be left tidy and at an acceptable visual state. 30. All work areas will be maintained, kept free of rubbish, and cleaned up at completion. 31. In the event the main works are delayed to a longer term or cancelled, the test pit locations and all work areas will be restored to an acceptable visual state with the indefinite time frame in mind.
Soils and Contamination	32. Erosion and sediment controls will be implemented in accordance with the Landcom/ Department of Housing *Managing Urban Stormwater, Soils and Construction Guidelines* (the Blue Book) and will be maintained to prevent sediment moving off-site and sediment laden water entering any water course during the construction process. 33. A site-specific erosion and sediment control plan will be developed, approved and implemented prior to commencement of the works. 34. Works will only commence once all erosion and sediment controls have been established. The controls will be maintained in place until the works are complete and all exposed erodible materials are stabilised. 35. If unexpected contaminated land is encountered during the works, works will stop immediately, and relevant procedures outlined in a Construction Environmental Management Plan (CEMP) will be followed. The EPA will be notified immediately in response to incidents causing or threatening actual or potential harm to the environment in accordance with section 148 of the *Protection of the Environment Operations Act 1997* (POEO Act) (via EPA Environment Line on 131 555). 36. Only clean equipment and vehicles will be used, with equipment being cleaned down before being brought to the site. 37. A site-specific erosion and sediment control plan that addresses the period between the early works and the main works will be developed, approved, and implemented prior to construction finishing. This is to address and control for any exposed loose soil as a result of the excavation and will include measures such as the use of Geofabric or Erosion Control Blankets to be placed at the test pit sites until the main works commence. 38. Once construction is complete, a management plan will be put into place for the regular monitoring of the excavated test pit sites and regular inspections of sediment control measures that will be left in place until the main works begin.
Water Quality	39. Works will avoid forecast high rainfall events and works will be planned to occur during a period of no or low flow. 40. A spill containment kit will be available during the works. All personnel will be made aware of the location of the kit and trained in its effective deployment. 41. Any required fuels and other liquids will be stored in self-safe chemical storage containers. 42. If required, all refuelling of plant and equipment will be in appropriately designated areas away from drainage lines or watercourses (at least 40 m) and managed in order to prevent any potential spills leaving the refuelling area (e.g., use of bunded areas).

Environmental Attribute	Safeguards/ Mitigation Measures
	43. Cleaning or washing will not occur near waterways or drainage lines. 44. All equipment will be maintained in good working order and operated according to manufacturer's specification. 45. No waste and/ or wastewater will be discharged directly or indirectly in waterways. 46. If small amounts of groundwater are encountered as a result of excavations, it will be pumped out and discharged to the surrounding area via controls including a silt fence and turkeys nest. 47. Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/ slicks) within construction site and adjacent area will be undertaken on a regular basis to identify any potential spills or deficient erosion and sediment controls during construction. 48. The Council and EPA will be notified immediately in response to incidents causing or threatening actual or potential harm to the environment in accordance with section 148 of the POEO Act (via EPA Environment Line on 131 555).
Bushfire	49. Works that are likely to cause a fire, such as general purpose hot works (welding, grinding or gas cutting), or any activity that is likely to produce a spark or flame are not to be carried on days with an elevated fire danger or a total fire ban in effect. 50. A fire extinguisher will be available on machinery for quick response if ignition occurs. All personnel will be made aware of the location of the extinguisher and trained in its effective deployment. 51. The contractor/ site manager is to maintain awareness of bushfire emergency information, in particular during a bushfire danger period, and be aware of all current bushfire alerts in the wider vicinity of the Activity area.
Noise and Vibration	52. Construction activities will be undertaken in accordance with EPA recommended standard construction hours: – Monday to Friday 7:00 am to 6:00 pm. – Saturday 8:00 am to 1:00 pm. – No work on Sundays or public holidays. 53. Where practicable, noise control should occur at the source and modifications to noise control should be investigated and implemented, such as sourcing low noise power tools or hydraulic or electrically controlled equipment instead of petrol or pneumatic equipment. 54. Any noise complaints will be recorded and include suitable identification/ description of the noise source (e.g. continual/ impulsive) and general location of the complaint. Any noise complaints will be investigated and actioned as required. 55. The most appropriately sized tool for the respective job will be used, keeping in mind that the smaller the tool, the less potential noise generated. 56. All vehicles and equipment will be turned off and not left idling when not required for work uses. 57. All plant will be fitted with appropriate exhaust systems to ensure compliance with pollution and noise emission standards.
Traffic and Access	58. All works will be undertaken under an approved Traffic Control Plan (TCP) prepared in accordance to TRC *C201 – Control of Traffic Specification* (TRC, 2019), including, but not limited to, management of the road closure and local traffic. 59. Local traffic movements, including private driveway access, will be maintained during the works through the use of traffic control measures. 60. Advanced warning signage will be established at appropriate and strategic locations as per the TGS, prior to and during the work to ensure road users and pedestrians are made aware of changed traffic/ access conditions.

Environmental Attribute	Safeguards/ Mitigation Measures
	61. All traffic closures/ disruptions/ changed road conditions would be communicated to road users in accordance with Council via suitable means/ media, including use of, but not limited to, letters, social media, Council website, Livetraffic website, and VMS boards.
Air Quality	62. Vegetation or other materials will not be burnt on-site. 63. Vehicles transporting waste or other materials that may produce odours or dust will be covered during transportation. 64. Construction works will not be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely. 65. Machinery and vehicles not in use during construction will be turned off and not left to unnecessarily run idle. 66. Vehicles, machinery, and equipment will be maintained in accordance with manufacturer's specifications in order to meet the requirements of the POEO Act and associated regulation. 67. Dust suppression techniques would be utilised to minimise the potential for dust generation/ dispersal during works, as required. 68. If required for dust suppression in the interim prior to the main works commencing, the exposed areas of soil as a result of the excavation works will be covered with Geofabric or Erosion Control Blankets.
Socio-economic	69. Contractors/ workers will be mindful of the needs of the local community. 70. Any potentially impacted parties or landholders will be consulted prior to construction with a goal of minimising or eliminating any adverse impacts. 71. Local residents will be provided with a contact number for lodging complaints. Complaints will be addressed by Council in a timely manner.
Waste	72. Working areas will be maintained, kept free of rubbish, and cleaned up at the end of the day. 73. Resource management hierarchy principles are to be followed: - Avoid unnecessary resource consumption as a priority. - Avoidance is followed by resource recovery (including re-use of materials, reprocessing, recycling, and energy recovery). - Disposal is undertaken as a last resort. 74. Waste material will not be left on-site once the works have been completed. 75. Any contaminated waste generated will be disposed of in accordance with the EPA approved methods of waste disposal. 76. Waste will be disposed of at a licensed waste or recycling facility as appropriate. 77. Material generated from tree removal is to be mulched on-site and taken to a licenced waste facility.
Climate Change	78. Vehicles and equipment will be switched off when not required for direct construction activities. 79. Waste will be minimised and is otherwise to be recycled or disposed of appropriately. 80. Vegetation removal will be minimised as far as practical.

7. Summary of Consideration of Environmental Factors

7.1 Section 171 Checklist

As part of its obligation under Section 5.5 of the EP&A Act, the determining authority is required to take into account, to the fullest extent possible, all matters likely to affect the environment. The determining authority is required by Section 171 of the EPA Regulation to give consideration to a number of factors that are listed below. **Table 7.1** provides a summary of the key issues relevant to each factor and the key mitigation measures proposed.

Table 7.1 Section 171 Checklist

	Factor	Impact
a	**The Environmental Impact on a Community**	
	The community would not be affected through declines in the local environment as a result of the Activity. Mitigation measures have been designed to reduce environmental impacts on the community to negligible levels.	Negligible and temporary
b	**The Transformation of a Locality**	
	Transformation of the locality is expected to be minimal. The Activity would be restricted to the four test sites along Port Stephens Cutting. Vegetation removal would be required for the excavations, however, given the nature of the site, visual impacts of the Activity are not expected to be significant.	Negative minor
c	**Any Environmental Impact on the Ecosystems of the Locality**	
	The ecosystems of the locality would not be affected through declines in local environmental values (e.g. biodiversity, physical environment) as a result of the Activity. Mitigation measures have been designed to reduce environmental impacts.	Minor, mitigation measures in place
d	**Any Reduction of the Aesthetic, Recreational, Scientific or Other Environmental Quality or Value of a Locality**	
	The Activity would result in a minor short-term reduction in aesthetic quality of the site due to construction vehicles. After the Activity, a minor negative impact would be isolated to the four test pits and expected to be a short-term impact, only remaining for several months until the start of the road upgrade main works. Mitigation measures have been designed to reduce impacts. No significant changes of the locality are expected to occur.	Minor, mitigation measures in place
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**	
	The Activity would result in a negligible impact on the aesthetic values of the site. The Activity would not	Negligible

	Factor	Impact
	negatively impact existing land uses. There would be no significant impacts to heritage, visual amenity, or social significance.	
f	**Any Impact on the Habitat of Protected Fauna (Within the Meaning of the *National Parks and Wildlife Act 1974*)**	
	With effective implementation of the safeguards provided in this REF, the Activity is not considered likely to have a significant negative impact on the habitat of any other protected fauna.	Negligible
g	**Any Endangering of any Species of Animal, Plant or Other Form of Life Whether Living on Land, in Water or in the Air**	
	With effective implementation of the safeguards provided in this REF, the Activity is not considered likely to significantly endanger any species of animal, plant, or other form of life.	Nil
h	**Any Long Term Effects on the Environment**	
	No negative long-term impacts would occur in the locality given the implementation of the proposed safeguards and measures in this REF.	Nil
i	**Any Degradation of the Quality of the Environment**	
	Degradation of the quality of the environment is not expected. Given the safeguards in this REF, any impacts are considered unlikely.	Nil
j	**Any Risk to the Safety of the Environment**	
	No negative long-term impacts would occur in the locality given the implementation of the proposed measures in this REF.	Negligible, safeguards in place to avoid/ minimise risk
k	**Any Reduction in the Range of Beneficial Uses of the Environment**	
	The Activity would not result in any reduction in the range of beneficial uses of the environment.	Nil
l	**Any Pollution of the Environment**	
	The Activity may adversely affect air quality during construction. The safeguards determined would minimise the duration and impact. Waste materials, fuel spills and particulate matter have the potential to cause pollution to the environment. However, given the proposed safeguards detailed in this REF and any waste being disposed within an appropriate/ approved waste disposal facility, pollution to the environment would not occur.	Minor, safeguards in place to avoid/ minimise risk
m	**Any Environmental Problems Associated with the Disposal of Waste**	
	Any wastes would be disposed of in a manner which would not damage or disturb any native flora or fauna or the physical environment. The disposal of such waste would be within a waste management facility in accordance with DPIE approved methods of waste disposal. Safeguards detailed in this REF would protect the environment from problems associated with waste disposal.	Nil
n	**Any Increased Demands on Resources (Natural or Otherwise) that are likely to Become in Short Supply**	

	Factor	Impact
	The Activity does not create any demand for resources that are in short supply nor is it likely to result in an increased demand on any natural resources that are likely to become in short supply.	Nil
o	**Any Cumulative Environmental Effect with Other Existing or Likely Future Activities**	
	The Activity is unlikely to have any significant impact on the environment, therefore would not significantly contribute to any cumulative impacts.	Negligible
p	**Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?**	
	The Activity is not located within a coastal area and would not result in any impact on coastal processes and coastal hazards.	Nil
q	**Any impact on applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1?**	
	Not applicable	Nil
r	**Any impact on other relevant environmental factors?**	
	Nil	Nil

7.2 Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth Legislation)

The EPBC Act protects/ regulates matters of national environmental significance, including:

- World heritage properties.
- National heritage places.
- Wetlands of international importance.
- Nationally threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- A water resource, in relation to coal seam gas development and large coal mining development.

Under the 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'. An assessment is provided in **Table 7.2** and no significant impact is expected.

Table 7.2 EPBC Act Considerations

Matter	Impact
Any impact on a World Heritage property?	
No World Heritage properties occur at or proximate to the site.	Nil
Any impact on a National Heritage place?	
No National Heritage properties occur at or proximate to the site.	Nil
Any impact on a wetland of international importance?	
Three international importance wetlands are identified in the Protected Matters Search Report (refer to **Appendix A**), however, Banrock station and Riverland are both located at the New South Wales and South Australia border, and the Coorong, and lakes alexandrina and albert wetland is located in South Australia. It is highly unlikely these sites will be affected by the Activity.	Nil
Any impact on nationally threatened species and ecological communities?	
Habitat for six threatened ecological communities, 41 threatened species (14 flora and 27 fauna species), five migratory terrestrial species, and seven migratory wetland species were listed as possible occurrences within the 10 km search area. No Commonwealth listed threatened flora, fauna or ecological communities are likely to be significantly affected by the Activity (refer to Biodiversity Assessment at **Section 5.1**) and safeguards have been provided to minimise any potential impacts. No marine habitat would be impacted.	Nil to Negligible
Any impact on a Nationally Important Wetland?	
No wetlands of national importance occur at or near the site.	Nil
Any impact on Migratory species?	
Based on the minor nature of the works, no listed migratory species are likely to be significantly affected by the Activity (refer to **Section 5.1**).	Nil
Any impact on a Commonwealth marine area?	
No Commonwealth marine areas occur at or near the site.	Nil
Any impact on the Great Barrier Reef Marine Park?	
The Great Barrier Reef Marine Park is distant from the site.	Nil
Does the Activity involve a nuclear action (including uranium mining)?	
The Activity does not involve a nuclear action.	Nil
Any impact on a water resource, in relation to coal seam gas development and large coal mining development?	
The Activity does not involve any impact on a water resource, in relation to coal seam gas development and large mining development.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	
The Activity is not expected to impact upon such land.	Nil

The assessment of the impact of the Activity on MNES and the environment of Commonwealth land has found that there is unlikely to be significant impact on relevant MNES. Accordingly, the Activity does not require referral to the Australian Government Department of Climate Change, Energy, the Environment and Water.

8. Conclusion and Certification

The Activity is for bulk material excavation from four test pits along Port Stephens Cutting to test in-situ material for suitability as road base and to assess construction methodology.

The Activity is permitted without development consent and subject to assessment under Part 5 of the EP&A Act. This REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed Activity. The Activity would result in some impacts; however, these are not likely to be significant and can be effectively managed/ameliorated through the implementation of the safeguards and mitigation measures recommended in this REF.

The Activity described will not affect areas of outstanding biodiversity value or Wilderness Areas. The Activity is unlikely to significantly affect threatened species or ecological communities or their habitats, within the meaning of the BC Act or FM Act and therefore a Species Impact Statement (or Biodiversity Development Assessment Report) is not required. The Activity is also unlikely to affect Commonwealth land or have a significant impact on any matters of national environmental significance in relation to the EPBC Act.

I certify to the best of my knowledge that:

- This REF provides a true and fair review of the Activity in relation to its potential effects on the environment, and
- The assessment satisfies the requirements of Sections 5.5 to 5.7 of the EP&A Act, Section 171 of the EP&A Regulation 2021, and other relevant legislation and guidelines, and
- The assessment has been adequately completed, and
- Subject to the inclusion of the safeguards/measures included in this REF, it is reasonable to conclude that the project will not likely have a significant impact on the environment during both the construction and operation phases, and
- Given the impacts of the Activity are not likely to be significant, an Environmental Impact Statement is not required under Section 5.7 of the EP&A Act, and
- A Species Impact Statement or BDAR is not required, and
- The Activity does not warrant/require referral to the Australian Department of Agriculture, Water and the Environment under the EPBC Act, and
- The Activity is not State Significant Infrastructure and does not require approval under Division 5.2 of the EP&A Act.

REF Prepared by	
Signature:	
Name:	Michelle Campione-van Zetten
Position:	Environmental Planner
REF Reviewed by	
Signature:	
Name:	Sarah Viney
Position:	Senior Environmental Scientist

9. Determining Authority Sign Off

Determining Officer (Public Authority) who Approves this REF

I certify to the best of my knowledge and on behalf of Tamworth Regional Council that:

☒ Based on the completed REF and my knowledge of the project, the assessment has been adequately completed, the project has predictable impacts which would not be significant, the conclusion as to the likely environmental impact of the project is reasonable, and the project can proceed subject to the relevant measures and conditions in this REF, any approval, license or permit.

☐ The project requires additional environmental assessment.

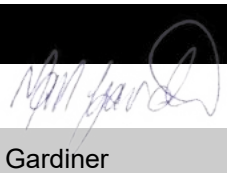
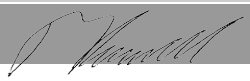
Reasons:

Enter Reasons.

☐ The project should not proceed in its current form.

Reasons:

NOTE: A site visit may be required depending on the level of confidence and risk to the environment.

Reviewed by:			
Signature		**Date:**	13 June 2023
Name	Mark Gardiner		
Position	Manager Project Planning & Delivery		
Determining Authority Name	Murray Russell, Acting Director Regional Services		
Determined By:			

References

Department of Agriculture and Water Resources (DAW) (2016). *Australian Weeds Strategy 2017 to 2027*. Available (https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/pests-diseases-weeds/consultation/aws-final.pdf).

Department of Environment, Climate Change and Water (DECCW) (2010). *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* [Online]. Available (https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Aboriginal-cultural-heritage/due-diligence-code-of-practice-aboriginal-objects-protection-100798.pdf) [Accessed March 2023].

Landcom (2004). *Managing Urban Stormwater: Soils and construction - Volume 1,* 4th edition [Online]. Available (https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Water/Water-quality/managing-urban-stormwater-soils-construction-volume-1-fourth-edition.pdf) [Accessed March 2023].

NSW Department of Planning and Environment (DPE) (2022). *Guidelines for Division 5.1 assessments* [Online]. Available (https://www.planning.nsw.gov.au/-/media/Files/DPE/Guidelines/Policy-and-legislation/SSI-Guidelines/Guidelines-for-Division-51-assessments.pdf?la=en) [Accessed March 2023].

NSW Department of Planning, Industry and Environment (DPIE) (2020). *Saving Our Species Hygiene Guidelines* [Online]. Available (https://www.environment.nsw.gov.au/research-and-publications/publications-search/hygiene-guidelines) [Accessed March 2023].

NSW Environment Protection Authority (EPA) (2020). *Draft Construction Noise Guideline* [Online]. Available (https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/20p2281-draft-construction-noise-guideline.pdf?la=en&hash=08B7AFCA1EABA290F78D720722E14F1F239FE6F8) [Accessed March 2023].

NSW Government (2022). *ePlanning Spatial Viewer* [Online]. Available (https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address) [Accessed March 2023].

Tamworth Regional Council (TRC) (2019). Construction Specification for Civil Works: C201 – Control of Traffic [Online]. Available (https://www.tamworth.nsw.gov.au/ArticleDocuments/594/C201%20Control%20of%20Traffic.pdf.aspx) [Accessed March 2023].

Invasive Plants and Animals Committee 2016, Australian Weeds

Strategy 2017 to 2027, Australian Government Department of

Agriculture and Water Resources, Canberra.

Copyright and Usage

Appendix A

Biodiversity Assessment Report

Biodiversity Assessment Report

Port Stephens Cutting Upgrade

Quality solutions. Sustainable future.

GeoLINK
environment | engineering | planning | design

GeoLINK Consulting Pty Ltd

PO Box 119
Lennox Head NSW 2478
T 02 6687 7666

PO Box 1446
Coffs Harbour NSW 2450
T 02 6651 7666

PO Box 1267
Armidale NSW 2350
T 02 6772 0454

PO Box 229
Lismore NSW 2480
T 02 6621 6677

info@geolink.net.au

Prepared for: Tamworth Regional Council

UPR	Description	Issued By	Date Issued
4513-1004	Issue 1	Ben Millan	21/03/2023
4513-1009	Issue 2	Ben Millan	22/05/2023

Table of Contents

Illustrations

Tables

Plates

Appendices

Executive Summary

This Stage 1 Biodiversity Assessment Report (BAR) has been prepared for Tamworth Regional Council for a proposed upgrade to a section of Nowendoc Road. Stage 1 involves the excavation of four investigative rock pits by contractors to allow for material testing. It is understood that the Activity would involve removing a 3x10m section from the cutting at all four test pit locations.

Results of field assessment are as follows:

- Areas of woodland on the site most closely align with the Plant Community Type (PCT) 3521 - Northwest White Box Woodland as described in the BioNet Vegetation Classification System.
- No *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or *Biodiversity Conservation Act 2016* (BC Act) listed threatened ecological communities (TECs) occur at the site.
- Four hollow-bearing trees were recorded adjacent to test pit locations.
- Other fauna habitat features, such as fallen logs and bush rocks occur throughout the site and general area.
- No threated flora or fauna were observed at the site although several species are potential occurrences.

Impacts of the Activity would include:

- Removal of up to 120 m^2 of PCT 3521.
- Fauna injury and mortality during clearing.
- Habitat degradation of adjacent habitat due to the clearing phase impacts.
- Topsoil stripping and earthworks during Test Pit excavation.
- Potential introduction or spread of weeds and pathogens.

Review of statutory instruments relevant to the Activity were completed as follows:

- BC Act: the Activity is unlikely to significantly affect any threatened species or communities listed under the BC Act.
- EPBC Act: the Activity is unlikely to significantly affect threatened species or communities, or migratory species listed under the EPBC Act.

A range of mitigation measures have been proposed to minimise potential impacts to biodiversity associated with the Activity.

1. Introduction and Background

1.1 Introduction

This Stage 1 Biodiversity Assessment Report (BAR) has been prepared for Tamworth Regional Council (TRC) for a proposed upgrade to a section of Nowendoc Road known as Port Stephens Cutting (refer to **Illustration 1.1** and **Illustration 1.2**). Stage 1 of the project involves the excavation of four investigative rock pits by contractors to allow for material testing, to determine its suitability for re-use as pavement material and to understand the ease of excavation and crushing. The project is currently in the planning and design phase, with these reports and accompanying recommended specialist studies to inform the detailed design options.

This Stage 1 BAR has been prepared to:

- Identify the biodiversity values of the site, particularly habitat for threatened species or communities listed under the *Biodiversity Conservation Act 2016* (BC Act) or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Identify native vegetation and habitat that may be impacted by the Activity.
- Assess the impacts of the Activity against the relevant statutory requirements.

1.2 The Sites

The site comprises a section of Nowendoc Road starting at the southern end (-31.3437, 151.2913) and ending at the northern end (-31.3155, 151.3114). Stage 1 will focus exclusively on the four investigative rock pit locations below:

- Test pit 1 (-31.33009, 151.30184).
- Test pit 2 (-31.32843, 151.30221).
- Test pit 3 (-31.32303, 151.31056).
- Test pit 4 (-31.32517, 151.30387).

The site broadly occurs within the Peel subregion of the Nandewar as per the Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (refer Thackway & Cresswell, 1995).

The site occurs primarily within the road reserve and is comprised of a road intersecting through adjacent shrubby woodland/ forest (refer to **Illustration 1.2**).

1.3 Legislative Context

This BAR has been prepared to inform a Part 5 of the *Environment Planning and Assessment Act 1979* (EP&A Act) assessment for the Activity and assess biodiversity impacts.

The works are permissible under the State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP (Transport and Infrastructure)). Section 2.108 of SEPP (Transport and Infrastructure) permits development on any land for the purpose of road or road infrastructure facilities activities to be carried out by or on behalf of a public authority without consent. Specifically, Section 2.108 (development permitted without consent), under the SEPP (Transport and Infrastructure) states that (as relevant to the Activity):

In this section and section 2.111, a reference to development for the purpose of road infrastructure facilities includes a reference to development for any of the following purposes if the development is in connection with a road or road infrastructure facilities:

(a) *construction works (whether or not in a heritage conservation area), including:*

(i) temporary buildings or facilities for the management of construction, if they are in or adjacent to a road corridor, and

(ii) creation of embankments, and

(iii) extraction of extractive materials and stockpiling of those materials, if:

(b) the extraction and stockpiling are ancillary to road construction, or

(c) the materials are used solely for road construction and the extraction and stockpiling take place in or adjacent to a road corridor, and

(d) temporary crushing or concrete batching plants, if they are used solely for road construction and are on or adjacent to a road corridor, and

(e) temporary roads that are used solely during road construction,

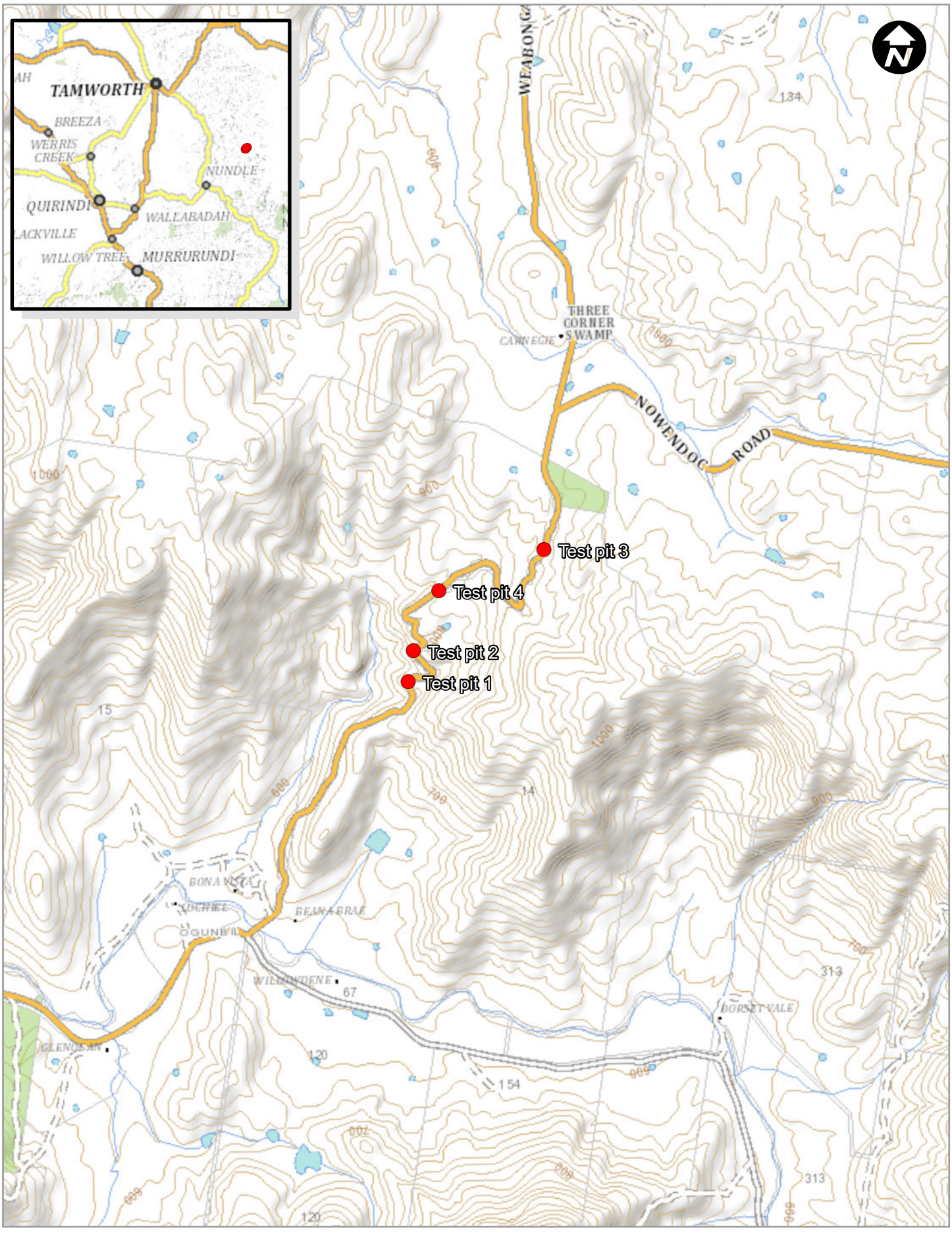
Section 7.2 of the BC Act and Part 7A of the *Fisheries Management Act 1994* (FM Act) require that the significance of the impact on threatened species and ecological communities is assessed using a Test of Significance. Where a significant impact is likely to occur, a species impact statement must be prepared in accordance with the Director-General's requirements, or a Biodiversity Development Assessment Report must be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM).

1.4 The Activity

The Activity is for the excavation of four investigative rock pits to allow for material testing at four select locations within the Port Stephens Cutting section of Nowendoc Road. The Activity would involve the excavation of bulk material for testing of the in-situ rock material located along the upward embankment above a section of Nowendoc Road locally known as Port Stephens Cutting. The testing is to determine the suitability of the material for reuse as road base for the Stage 2 main works of the Port Stephens Cutting upgrade. In addition, the opportunity will be taken to assess the construction methodology for the excavations related to the main works road widening. Port Stephens Cutting is a narrow section of road with many tight corners where the safety would be improved through road widening and an upgrade.

The Activity will remove or modify up to 120 m^2 of native vegetation to facilitate the works. The Activity will generally comprise the following components:

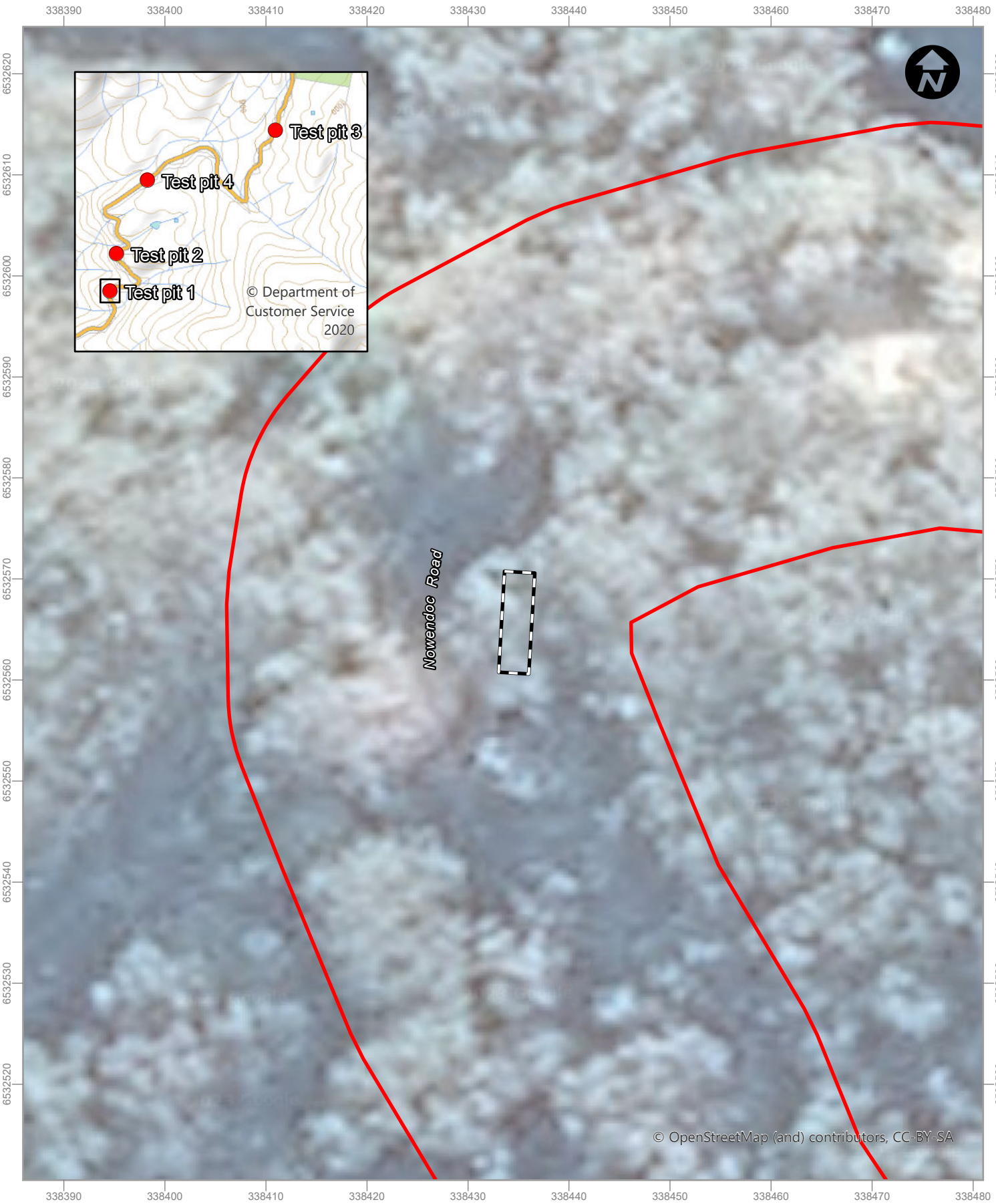
- Establish to site (implement sed controls and traffic controls, construct compound).
- Clear trees and vegetation from the eastern side of the existing road, as shown in **Illustration 4.1**.
- Excavation of four investigative rock pits by contractors.
- Loading and transporting the material to Winton quarry.
- Removal of traffic controls.



0 600 Metres

Locality Plan - Illustration 1.1

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Department of Customer Services
Date: 17/03/2023



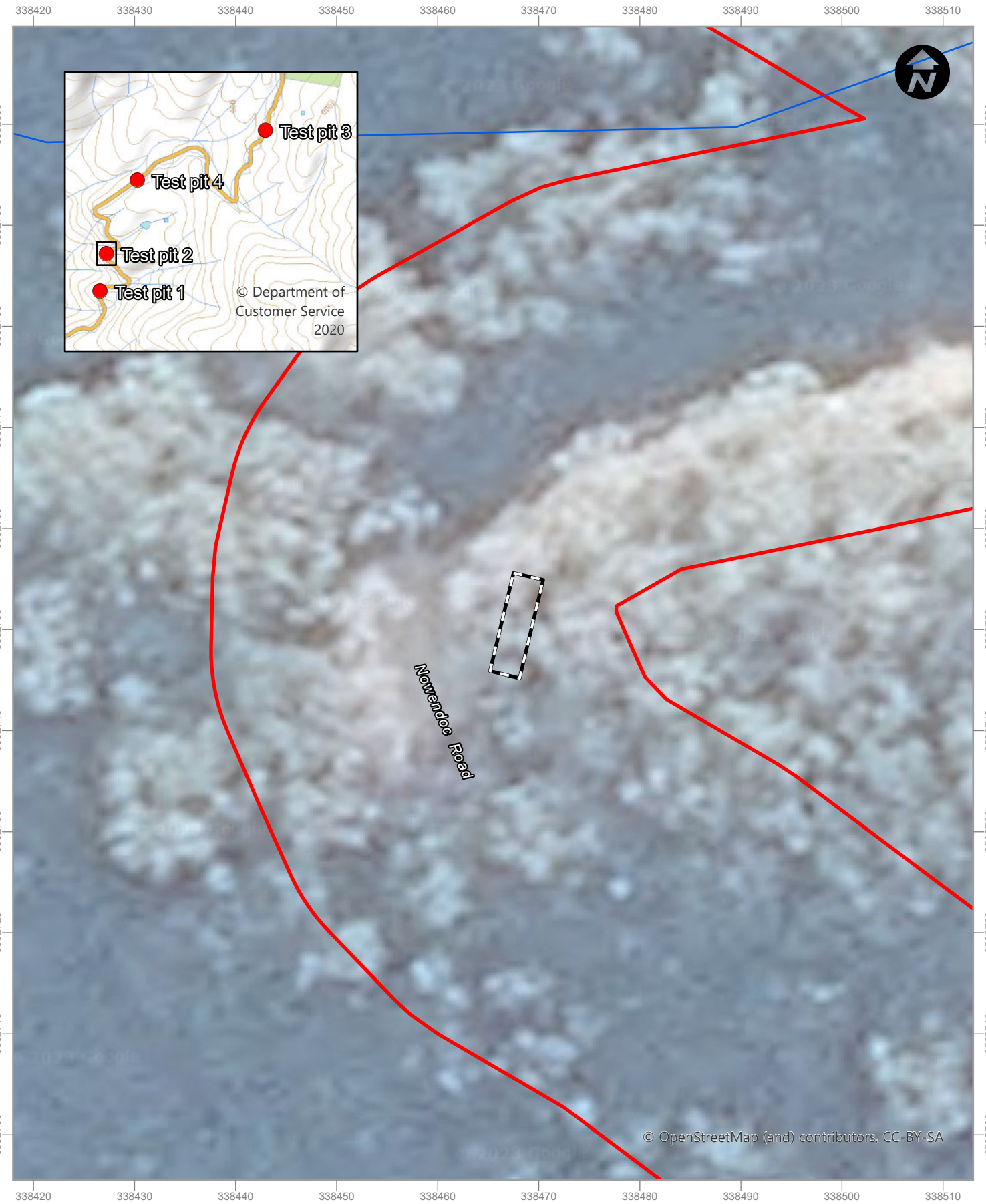
LEGEND

- Survey area
- Test pit location impact area

0 10 Metres

The Site
Illustration 1.2 - Sheet 1 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 20/03/2023



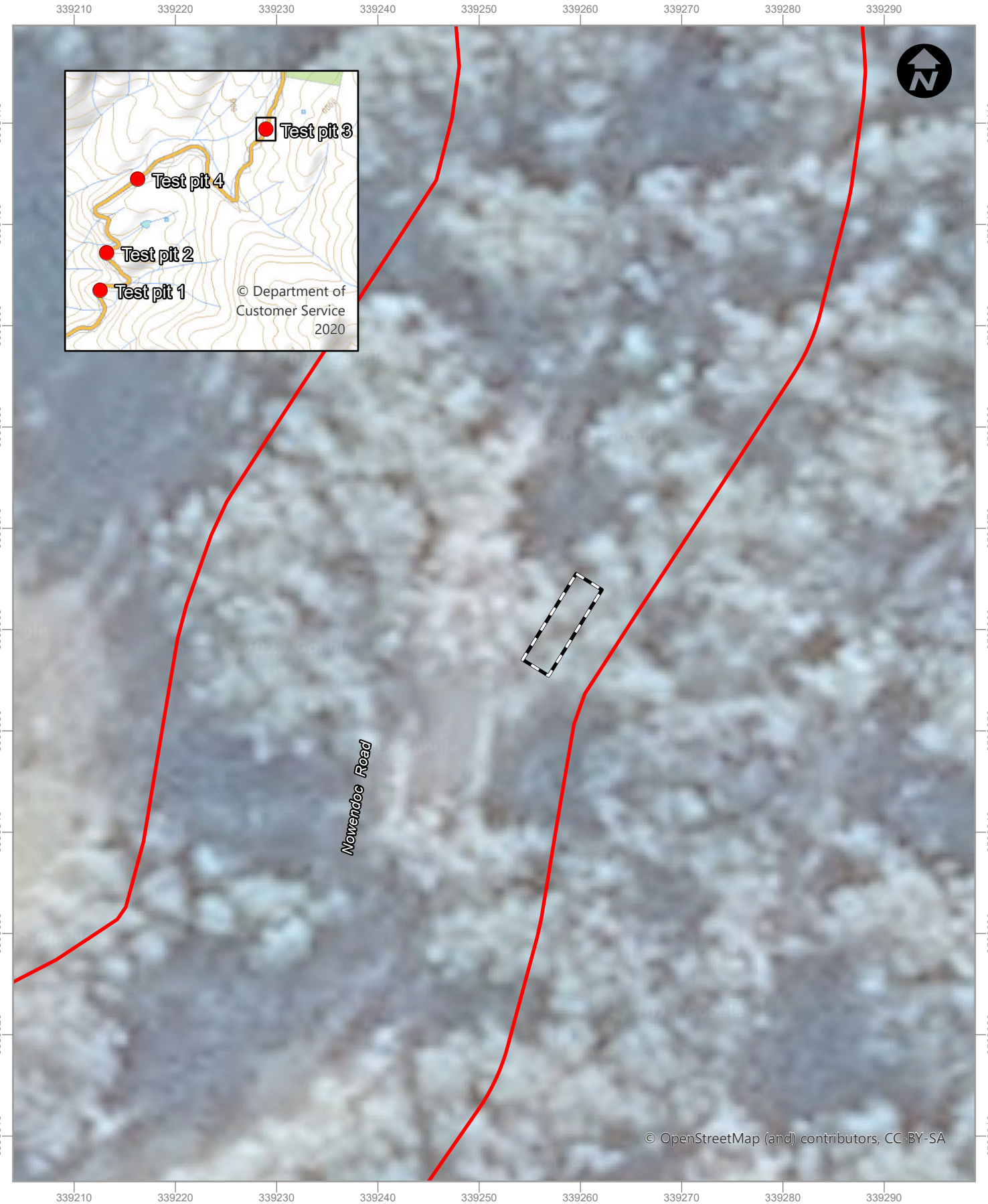
LEGEND

- Survey area
- Test pit location impact area
- Watercourse

0 10 Metres

The Site
Illustration 1.2 - Sheet 2 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 20/03/2023



LEGEND

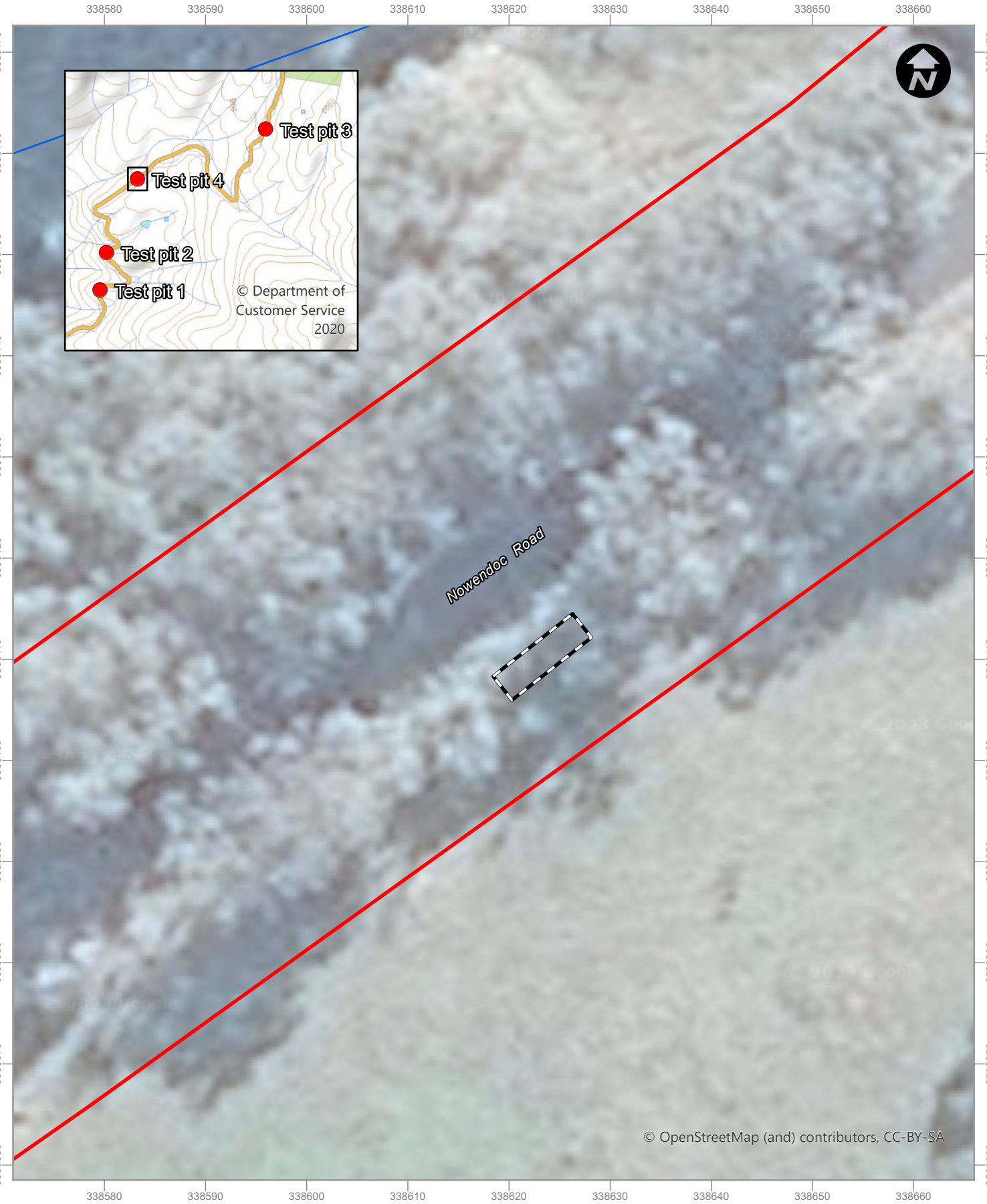
Survey area

Test pit location impact area

0 10 Metres

The Site
Illustration 1.2 - Sheet 3 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 20/03/2023



LEGEND

- Survey area
- Test pit location impact area
- Watercourse

0 10 Metres

The Site
Illustration 1.2 - Sheet 4 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 20/03/2023

2. Methodology

2.1 Desktop Review

The following desktop review was completed prior to field assessment:

- A search of the BioNet Wildlife Atlas (20 km x 20 km grid centred on the site); completed 27 January 2023.
- A search of the Protected Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES) within a 10 km radius of the site; completed 30 January 2023.

The desktop assessment results were used to inform the field survey methodology (refer to **Section 2.2**).

2.2 Field Assessment

The field assessment was completed by GeoLINK ecologist Ben Millan on 1 and 2 February 2023 using the following methodology:

- Vegetation assessment and mapping including identifying vegetation communities to BioNet plant community types (PCTs).
- Targeted surveys for threatened flora (as identified in BioNet searches).
- Identification of threatened ecological communities (TECs).
- Opportunistic survey of all fauna based on visual or aural observations.
- Identification and survey (by GPS) of any hollow-bearing trees.
- Survey of locatable culverts for microbat habitat.
- Opportunistic searches for Koala scats beneath mature trees using the Spot Assessment Technique described in Phillips & Callaghan (2011) were undertaken.

2.2.1 Survey Limitations

Despite a thorough search, it is always the case that some cryptic flora species that are difficult to locate may have been overlooked in the survey. If there was any doubt as to whether smaller more cryptic threatened flora species may be present these species were assumed present and a test of significance for potential impacts of the Activity undertaken.

While highly mobile fauna species may be difficult to detect during site assessments, the survey techniques utilised provide suitable sampling for a range of fauna with an emphasis on targeting threatened species most likely to occur within the study area. Based on local fauna records, vegetation and habitats occurring in the study area, predictions of threatened fauna usage can be made with a relatively high level of confidence.

3. Desktop Analysis

3.1 Desktop Search Results

3.1.1 BioNet Search

BioNet search results identified records of six threatened flora species, 12 threatened fauna species, and habitat for 15 TECs (four of which are listed under the EPBC Act) within the search area (refer to **Appendix A**).

3.1.2 EPBC Protected Matters Report

The Protected Matters Search Tool (PMST) identified 41 threatened species, 13 EPBC Act listed migratory species, and six TECs which may have habitat within a 10 km radius of the site (refer to **Appendix A**). Relevant species are included in the potential occurrence assessments in **Appendix B**. The site does not comprise Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) defined important habitat for any of these species and therefore EPBC Act listed migratory species are not considered a constraint for the Activity.

3.1.3 Biodiversity Value Mapping

The Port Stephens Cutting site contains biodiverse riparian land as mapped by the Biodiversity Values Map and Threshold (BMAT) tool (refer to **Plate 3.1**). None of the Stage 1 test pit locations are adjacent to the mapped land. As the Activity is being assessed under Part 5 of the EP&A Act the NSW Biodiversity offsets scheme (BOS) does not apply and preparation of a BDAR is not compulsory.

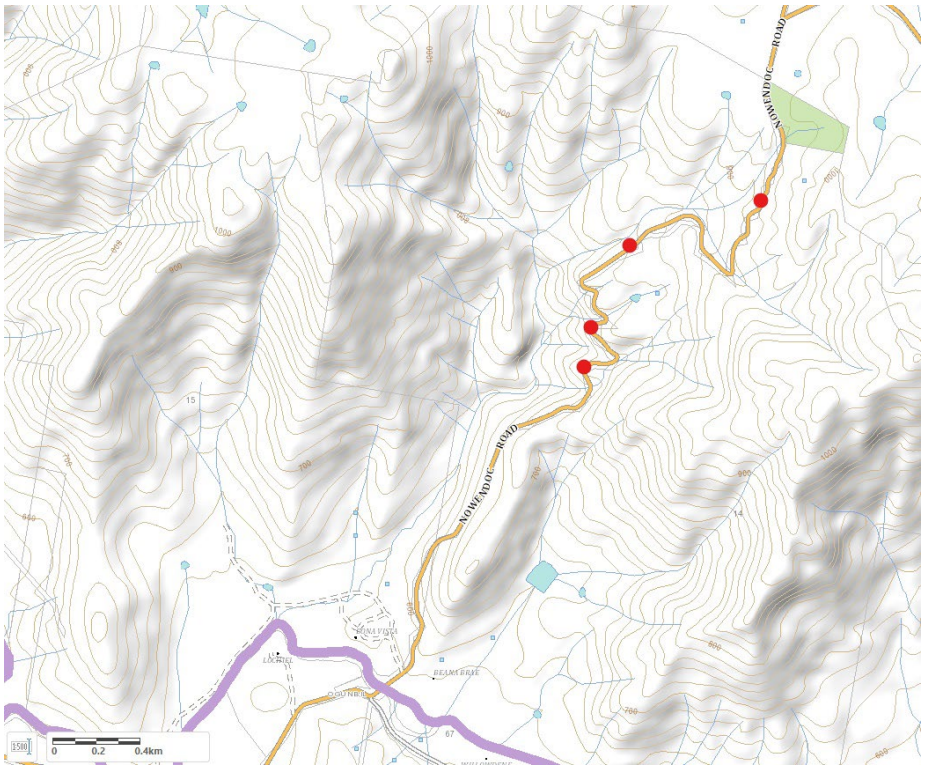


Plate 3.1 Riparian land mapped as Biodiversity Values land close to the site (BMAT tool 2023), red dots indicate test pit sites.

3.1.4 Areas of Outstanding Biodiversity Value

No areas of outstanding biodiversity value, as listed under the BC Act, have been declared in the Tamworth Regional local government area (LGA).

3.1.5 Geology and Soils

The eSPADE 2.2 state-wide land and soil mapping under the Australian soil classification lists the site as being made up of Rudosols.

3.1.6 Key Fish Habitat

No waterways would be impacted by the Activity.

4. Site Assessment

4.1 Vegetation

Plant Community Types (PCTs) occurring within the test pit locations are described in **Section 4.1.1** and shown in **Illustration 4.1** and **Plate 4.1.**

4.1.1 Good condition PCT 3521 - Northwest White Box Woodland

The canopy in this community is dominated by White Box (*Eucalyptus albens*). Other canopy species scattered throughout the site include Broad-leaved Stringybark (*Eucalyptus caliginosa*), Rough-barked Apple (*Angophora floribunda*), Kurrajong (*Brachychiton populneus*), Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*). The shrub layer comprises Hickory Wattle (*Acacia implexa*), Velvet Mock Olive (*Notelaea macrocarpa* var. *microcarpa*), Native Blackthorn (B*ursaria spinosa*), Sticky Hop-bush (*Dodonaea viscosa*), Sticky Daisy-bush (*Olearia elliptica*) and *Cassinia quinquefaria*. The groundcover comprises Slender Bamboo Grass (*Austrostipa verticillata*), Wild Oats (*Avena fatua*)*, Common Couch (*Cynodon dactylon*), Cocksfoot (*Dactylis glomerata*)*, Queensland Bluegrass (*Dichanthium sericeum*), Slender Rat's Tail Grass (*Sporobolus creber*), Kangaroo Grass (*Themeda triandra*) Rock Fern (*Cheilanthes sieberi* subsp. *sieberi*), Great Mullein (*Verbascum thapsus* subsp. *thapsus*)*, and Purpletop (*Verbena bonariensis*)*.

*denotes exotic species.

This community is present in a good condition, with only minimal disturbances from historic clearing, road construction and edge effects.

Plate 4.1 Photo of PCT 3521 occurring on site.

4.1.2 Threatened Ecological Communities (TECs)

No EPBC Act or BC Act listed TECs occur at the site. While PCT 3521 is consistent with the required canopy species for White Box-Yellow Box-Blakely's Red Gum Grassy Woodland TEC, vegetation on site was consistent with shrubby woodland (>30% shrub cover) and hence not consistent with the requirements for the TEC.

4.1.3 Threatened Flora

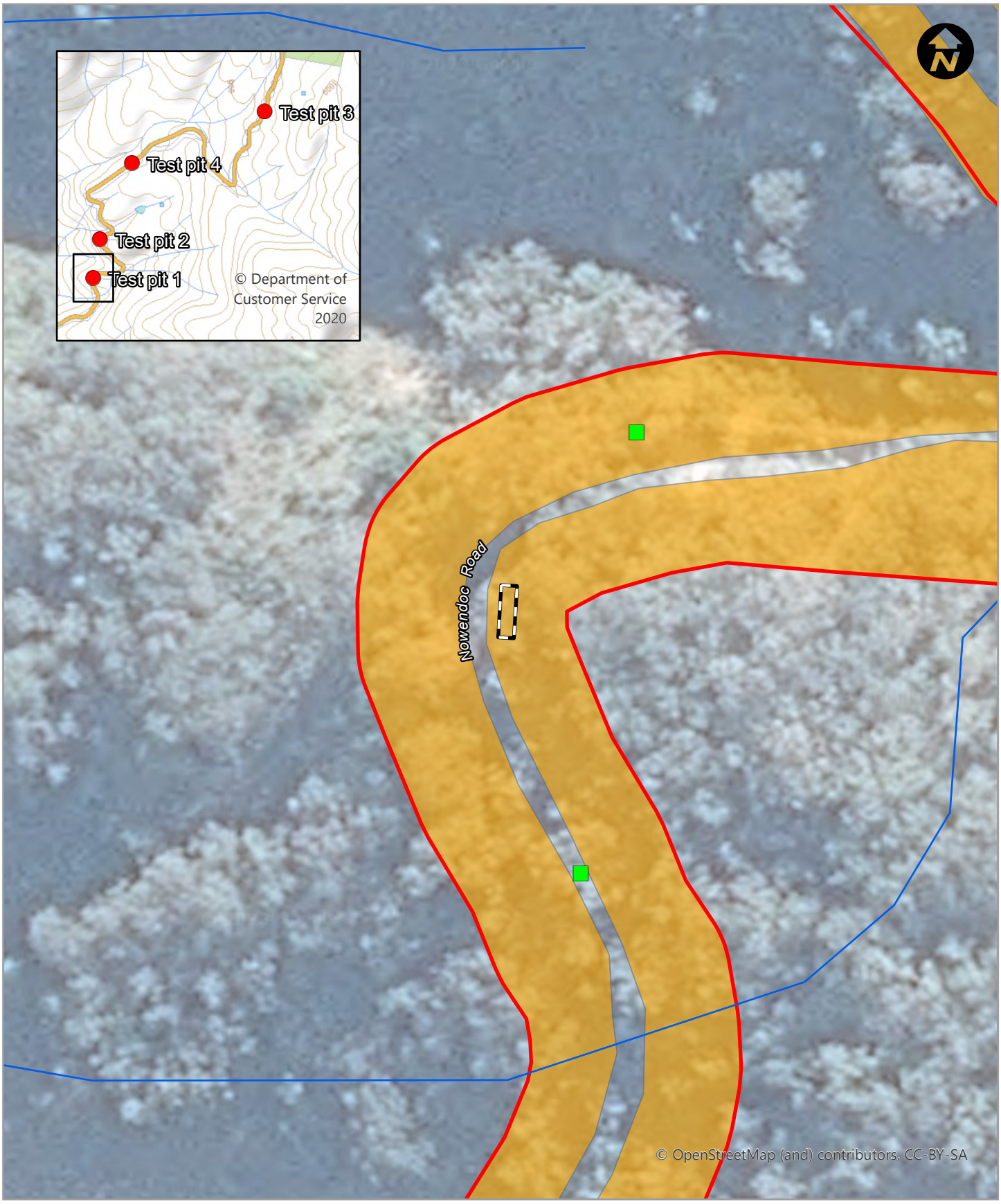
No threatened flora species listed under the BC or EPBC Act were recorded at the site.

Two threatened flora species; *Euphrasia arguta* and *Thesium austral* were considered a potential occurrence at the site based on suitable habitat. Due to their cryptic nature, these species can be difficult to detect in the field (especially when not actively flowering), so an assumption was made that potential habitat for the species may be impacted by the Activity.

4.1.4 Weeds

One Weed of National Significance (Blackberry) listed in the National Weeds Strategy and managed under the *Biosecurity Act 2015* occurs at the site. Blackberry has the following biosecurity duties:

- *All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*
- *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* All species in the *Rubus fruiticosus* species aggregate have this requirement, except for the varietals Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree.
- *The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone: Land managers should mitigate the risk of new weeds being introduced to their land; land managers should mitigate spread from their land. Core infestation: Land managers reduce impacts from the plant on priority assets.*



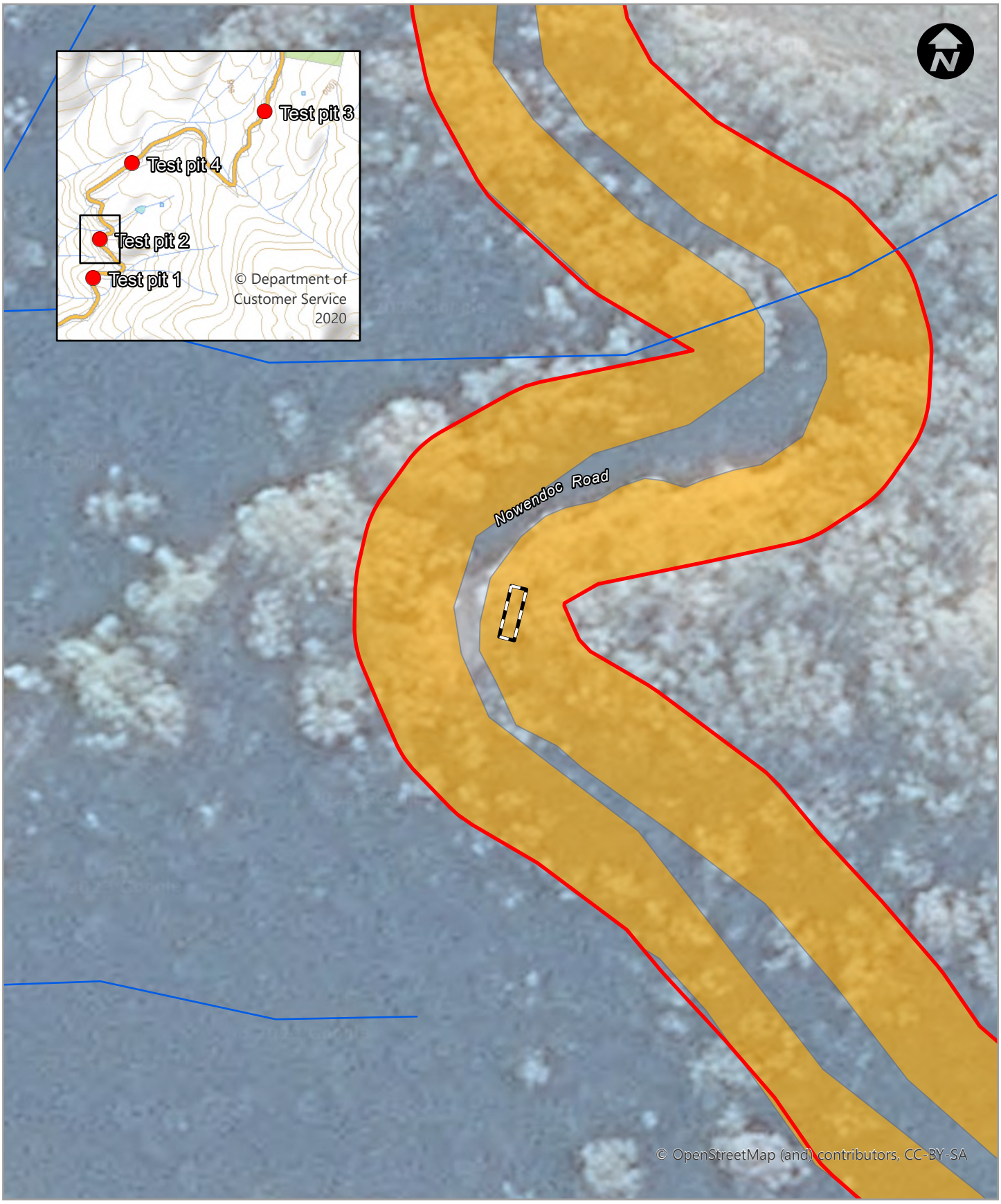
LEGEND

- Survey area
- PCT 3521 - Northwest White Box Woodland / good condition
- Test pit location impact area
- Watercourse
- Hollow-bearing trees

0 20 Metres

Biodiversity Constraints
Illustration 4.1 - Sheet 1 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 21/03/2023



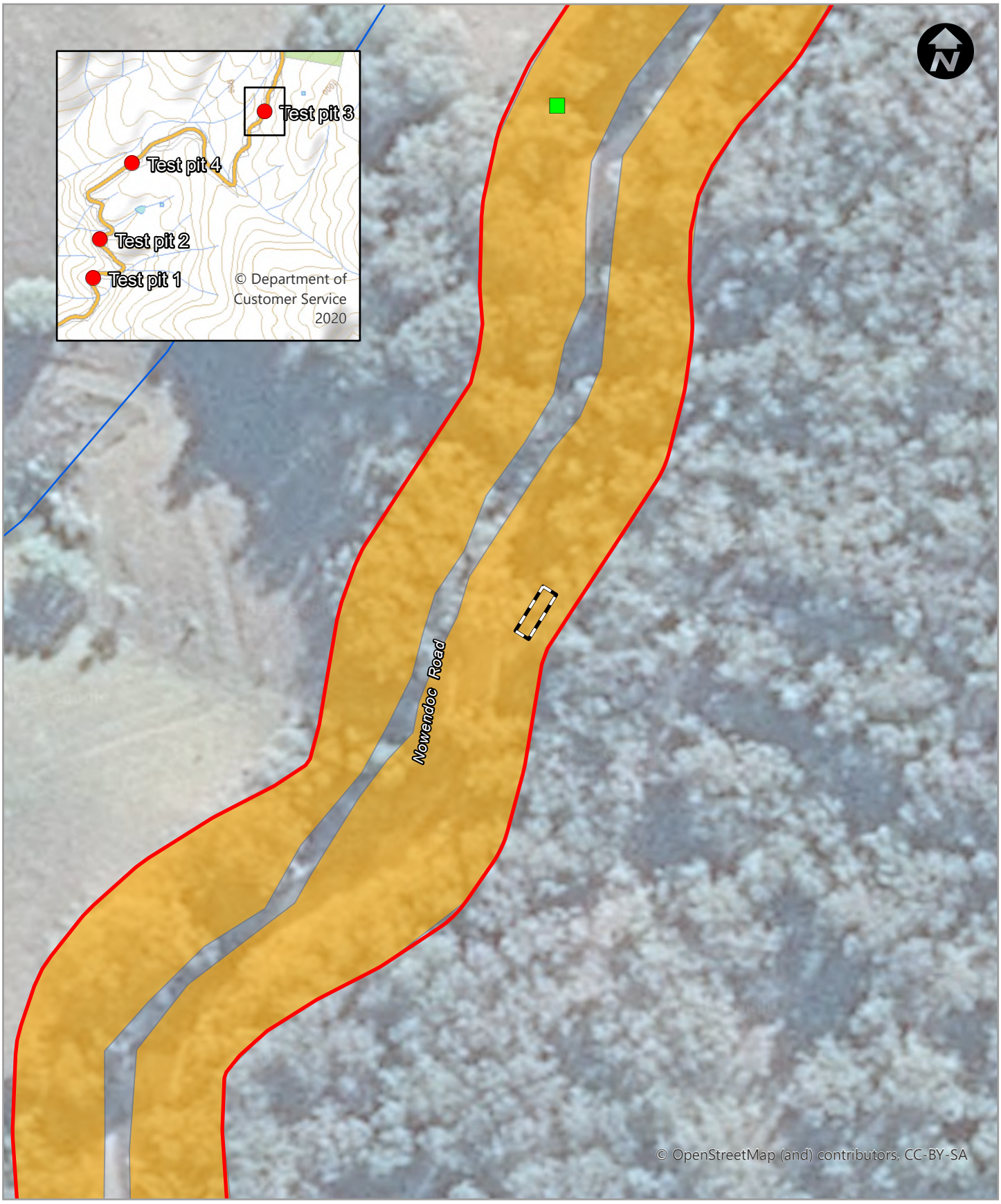
LEGEND

- Survey area
- PCT 3521 - Northwest White Box Woodland / good condition
- Test pit location impact area
- Watercourse

0 20 Metres

Biodiversity Constraints
Illustration 4.1 - Sheet 2 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 21/03/2023



LEGEND

- Survey area
- PCT 3521 - Northwest White Box Woodland / good condition
- Test pit location impact area
- Watercourse
- Hollow-bearing trees

0 20 Metres

Biodiversity Constraints
Illustration 4.1 - Sheet 3 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 21/03/2023

LEGEND

- Survey area
- PCT 3521 - Northwest White Box Woodland / good condition
- Test pit location impact area
- Watercourse
- Hollow-bearing trees

0 20 Metres

Biodiversity Constraints
Illustration 4.1 - Sheet 4 of 4

Information shown is for illustrative purposes only
Drawn by: AB Checked by: BJM Reviewed by: MCZ
Source of base data: Google Maps
Date: 21/03/2023

4.2 Fauna Habitat

4.2.1 Habitat Features

While the site has been subjected to some historic clearing and occurs within a road reserve, the areas of eucalypt woodland adjacent to the site are in good condition and native trees, shrubs, and grasses provide potential foraging, roosting and nesting resources for locally occurring native fauna including birds, mammals, reptiles, and microchiropteran bats associated with seasonally fruiting/ flowering trees.

4.2.1.1 Habitat Trees

Four hollowing-bearing trees were recorded adjacent to test pit locations (refer to **Table 4.1** and **Illustration 4.1**). These trees contain a number of small to large sized hollows which provide potential resources for hollow-obligate species such as nesting birds, arboreal mammals and microbats. No possum dreys or bird nests were recorded at the site. No habitat trees would be impacted by the Activity. Photos of HBTs are shown in **Plate 4.1** to **Plate 4.4**.

Table 4.1 Habitat Features Adjacent to Test Pit Locations

Ref. No.	Latitude	Longitude	Common Name	Scientific Name	Tree Height (m)	DBH (cm)	Total Hollows	Small Limb Holllow	Medium Limb Holllow	Large Limb Holllow	Small Trunk Holllow	Medium Trunk Holllow	Large Trunk Holllow	Nests
H13	-31.325053	151.304455	White Box	*Eucalyptus albens*	18	100	1	0	0	1	0	0	0	0
H17	-31.322186	151.310699	Stag	-	8	40	2	1	1	0	0	0	0	0
H22	-31.330565	151.301998	White Box	*Eucalyptus albens*	10	50	2	2	0	0	0	0	0	0
H23	-31.329808	151.302122	White Box	*Eucalyptus albens*	15	50	2	2	0	0	0	0	0	0

Plate 4.2 Photo of Habitat Tree 13

Plate 4.3 Photo of Habitat Tree 17

Plate 4.4 Photo of Habitat Tree 22

Plate 4.5 Photo of Habitat Tree 23

4.2.1.2 Aquatic Habitat

No waterways or ephemeral tributaries traverse the proposed Test Pit locations.

4.2.1.3 Microbat Roost Habitat (Culverts)

No culverts were recorded within or adjacent to the Test Pit locations. The heritage listed retaining wall occurring along the western side of the site provides low quality opportunistic microbat roost habitat in the form of small crevasses in the structure. No evidence of microbat usage was detected however, and the rock wall would not be impacted during Stage 1 Test Pit excavations.

4.2.2 Connectivity

The landscape within the locality comprises shrubby woodland. In general, native vegetation at the site is well connected with adjacent vegetation. The cleared road easement results in a break in connectivity between vegetation at the site, which is typically narrow (<10 m in sections). Given the

scope of the Activity within a previously disturbed road corridor, connectivity on site is expected to remain the same post works. The site forms part of the following mapped regional corridors and key habitats (Scotts 2003):

- Great Eastern Tablelands Corridor.
- Granite Belt - Stepping Stone Key Habitat.
- Regional Corridors – Nandewar.
- Nundle/ Moonbi – Fauna Key Habitats for Nandewar.

4.2.3 Threatened Fauna Species

No threatened fauna species were confirmed at the site during the site inspection. No evidence of Koala usage was detected during the site inspection during opportunistic scat searches below mature trees. However, the road reserve and adjacent vegetation is likely used as foraging and nesting/ roosting habitat by the following species, as part of a broader area with similar habitat values:

Birds

- Regent Honeyeater – Foraging and nesting habitat.
- Dusky Woodswallow – Foraging and nesting habitat.
- Painted Honeyeater – Foraging and nesting habitat.
- Swift Parrot – Foraging habitat.
- Powerful Owl – Foraging and nesting habitat.
- Scarlet Robin – Foraging and nesting habitat.
- Flame Robin – Foraging and nesting habitat.

Mammals

- Spotted-tailed Quoll – Foraging habitat.
- Eastern False Pipistrelle – Foraging and non-breeding roost habitat.
- Corben's Long-eared Bat – Foraging and non-breeding roost habitat.
- Greater Glider – Foraging habitat.
- Squirrel Glider – Foraging and nesting habitat.
- Koala – Foraging habitat.
- Greater Broad-nosed Bat – Foraging and non-breeding roost habitat.

A potential occurrence assessment was completed and is provided in **Appendix B**. No migratory species listed under the EPBC Act were recorded at the site.

5. Impacts and Mitigation

5.1 Potential Impacts of the Activity

The potential direct and indirect impacts from the Activity include:

- The direct removal of 120 m^2 (proposed removal of 30 m^2 per Test Pit site) of native shrubby woodland vegetation comprising good condition PCT 3521 - *Northwest White Box Woodland*.
- Topsoil stripping and earthworks during Test Pit excavation.
- Direct mortality or injury to fauna during vegetation clearing.
- Habitat degradation of adjacent habitat due to potential clearing phase impacts (e.g., erosion and sedimentation impacts or chemical spills).
- Removal of potential habitat for the following threatened species:
  - Austral Toadflax.
  - Euphrasia arguta.
  - Regent Honeyeater
  - Dusky Woodswallow.
  - Painted Honeyeater.
  - Swift Parrot.
  - Powerful Owl.
  - Scarlet Robin.
  - Flame Robin.
  - Spotted-tailed Quoll.
  - Eastern False Pipistrelle.
  - Corben's Long-eared Bat.
  - Greater Glider.
  - Squirrel Glider.
  - Koala.
  - Greater Broad-nosed Bat.

  Tests of significance undertaken concluded that the Activity was unlikely to result in a significant impact on any of these BC Act listed threatened species (refer to **Appendix C**).

- Edge effects degrading habitat adjacent to the site. This impact is unlikely to be detrimental to the habitat value of adjacent habitat for a range of species given the location of the sites along the road reserve (thus subject to existing edge effects).
- Unintentional introduction or spread of noxious/ environmental weeds.
- Unintentional introduction or spread of propagules or plant disease by way of plant and machinery particularly:
  - Phytophthora (*Phytophthora cinnamomi*) a soil-borne plant pathogen.
  - Myrtle rust (*Puccinia psidii*) a fungal disease which infects plants in the *Myrtaceae* family.

This impact is relatively low in a local context and would be managed with a relatively high confidence such that biodiversity impacts may be minimised with the implementation of safeguards. The Activity is considered unlikely to have a significant impact on any threatened species, endangered populations or ecological communities listed under the BC Act, EPBC Act or FM Act.

5.2 Biodiversity Safeguards

The corresponding REF prepared for the Activity describes general environmental safeguards required as part of the Activity. The following biodiversity safeguards would be implemented to prevent adverse impacts relating to biodiversity:

1. The works footprint would be clearly delineated where it adjoins the PCTs and habitat trees to prevent unnecessary disturbance or accidental clearing.
2. Vegetation removal is to be kept to the minimum extent required to undertake the works (refer to **Illustration 4.1**).
3. All vegetation being removed would be inspected for fauna prior to clearing. If fauna are present, works would stop until the animal voluntarily vacates the site; or a spotter-catcher or ecologist would be contacted to undertake fauna capture and relocation. If threatened species are present (e.g. Koala), works would stop and an ecologist contacted to determine the most appropriate course of action.
4. Hollow-bearing trees will be identified on site and retained as a priority.
5. Should removal of habitat trees be required a spotter-catcher or ecologist will be present during trimming or felling of habitat features.
6. Species ID cards will be created and readily available in the site office for the cryptic species *Euphrasia arguta* and *Thesium austral*. Workers will be made aware of these species defining features and preferred habitat during the site induction.
7. Locations for plant parking will be selected based on minimal vegetation disturbance and locations will be inspected prior to use.
8. If unexpected, threatened flora or fauna is detected, then stop works immediately and notify the Tamworth Regional Council Project Manager who would then contact an ecologist to determine the most appropriate course of action.
9. Contact an animal rescue agency/ wildlife care group or vet in the event that native fauna are injured. WIRES Central Northern: 1300 094 737.
10. Trees would be directionally felled away from adjacent intact vegetation to avoid unnecessary damage.
11. Ensure all plant, equipment and personnel are free of soil and potential weed propagules prior to being brought to the site or leaving the site, in accordance with the Saving Our Species Hygiene Guidelines (DPE, 2020).

6. Statutory Requirements

The following environmental instruments are relevant to the Activity as a part 5 project under the Environmental Planning and Assessment Act 1979 (EP&A Act):

- Biodiversity Conservation Act 2016.
- Environment Protection and Biodiversity Conservation Act 1999.

6.1 Biodiversity Conservation Act 2016

This assessment has been prepared in accordance with the *Biodiversity Conservation Act 2016* provisions. Tests of significance ('five-part tests') under Section 7.3 of the BC Act were completed for the following species:

Threatened Flora:

- Austral Toadflax.
- *Euphrasia arguta.*

Threatened Fauna:

Birds
- Regent Honeyeater.
- Dusky Woodswallow.
- Painted Honeyeater.
- Swift Parrot.
- Powerful Owl.
- Scarlet Robin.
- Flame Robin.

Mammals
- Spotted-tailed Quoll.
- Eastern False Pipistrelle.
- Corben's Long-eared Bat.
- Greater Glider.
- Squirrel Glider.
- Koala.
- Greater Broad-nosed Bat.

The tests concluded the Activity would not result in any significant impacts to these species.

6.2 Environmental Protection and Biodiversity Conservation Act 1999

The EPBC Act protects/regulates matters of national environmental significance, including:

- World heritage properties.
- National heritage places.
- Wetlands of international importance.
- Nationally threatened species and ecological communities.
- Migratory species.

- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- A water resource, in relation to coal seam gas development and large coal mining development.

Based on the site assessment and review of the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (CoA, 2013), the Activity would be unlikely to result in a significant impact on Austral Toadflax, *Euphrasia arguta*, Regent Honeyeater, Painted Honeyeater, Swift Parrot, Spotted-tailed Quoll, Corben's Long-eared Bat, Koala or any other MNES as indicated by results of the Protected Matters Search Tool database search (refer to **Appendix A**).

Based on the search results and site assessment, no significant impacts to any MNES (shown in **Table 6.1**) would be likely to result from the Activity, therefore referral to the Minister is not required.

Table 6.1 Assessment of MNES

Matter	Impact
Any impact on a World Heritage property?	
The MNES search results did not identify any World Heritage properties within 10 km of the site.	Nil
Any impact on a National Heritage place?	
The MNES search results did not identify any National Heritage places within 10 km of the site.	Nil
Any impact on a Wetland of International Importance?	
The MNES search results did not identify any wetlands of international importance (Ramsar sites) occur within 10 kilometres of the site.	Nil
Any impact on nationally threatened species and ecological communities?	
Habitat for six threatened ecological communities and 41 threatened species is identified within 10 km of the site. Two threatened flora species and six threatened fauna species were determined to potentially occur at the site (refer to **Appendix B**). The Activity is unlikely to result in a significant impact on any of these EPBC Act listed threatened species.	Minor
Any impact on Migratory species?	
Habitat for 13 migratory species is identified within 10 km of the sites. No migratory fauna species were recorded in the site survey. No migratory species are likely to be significantly affected by the Activity given that no key areas of breeding habitat for these species would be affected.	Minor
Any impact on a Commonwealth marine area?	
No Commonwealth marine areas occur within 10 km of the site.	Nil
Any impact on the Great Barrier Reef Marine Park?	
The Activity will not impact on the Great Barrier Reef Marine Park (Queensland).	Nil
Does the project involve a nuclear action?	
No nuclear actions are proposed.	Nil
Does the project involve impacts to a water resource, in relation to coal seam gas development and large coal mining development?	
The Activity is not a mining development	Nil

6.3 Fisheries Management Act 1994 (FM Act)

No waterways would be impacted by the Activity. A DPI Fisheries Permit application would not be required.

7. Conclusion

Results of this Biodiversity Assessment Report indicate that the Activity is unlikely to significantly affect threatened species, ecological communities, or their habitats, within the meaning of the *Biodiversity Conservation Act 2016* or *Fisheries Management Act 1994*. The Activity is also unlikely to affect Commonwealth land or have an impact on any matters of national environmental significance as listed under the *Environment Protection and Biodiversity Conservation Act 1999* and therefore referral to the Commonwealth Environment Minister and DCCEEW is not required.

The Activity may result in some biodiversity impacts. However, these would not result in a significant impact on any threatened species or communities and these impacts can be effectively managed through the implementation of the safeguards in this Biodiversity Assessment Report.

References

Commonwealth of Australia (2013). *Matters of National Environmental Significance - Significant impact guidelines 1.1* [Online]. Available (https://www.dcceew.gov.au/environment/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance) [Assessed February 2023].

Department of the Environment (Cth) (2022). Protected Matters Search Tool. [Accessed January 2023]

NSW Department of Planning and Environment (DPE) (2022a). *Koala habitat and feed trees* [Online]. Available (https://www.environment.nsw.gov.au/topics/animals-and-plants/native-animals/native-animal-facts/koala/koala-habitat) [Accessed February 2023].

NSW Department of Planning, Industry and Environment (2020). *Saving Our Species Hygiene Guidelines* [Online]. Available (https://www.environment.nsw.gov.au/research-and-publications/publications-search/hygiene-guidelines) [Assessed February 2023].

NSW Department of Primary Industries (2022). *NSW Fisheries Spatial Data Portal* for Tamworth LGA [Online]. Available (https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries_Data_Portal) [Assessed May 2023].

NSW Department of Primary Industries (2022). *NSW Weedwise* for Tamworth LGA [Online]. Available (https://weeds.dpi.nsw.gov.au) [Accessed October 2023].

NSW Environment, Energy and Science (2022). *Area of Outstanding Biodiversity Value register* [Online]. Available (https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/areas-of-outstanding-biodiversity-value/area-of-outstanding-biodiversity-value-register) [Accessed May 2023].

NSW DPIE (2022b). *NSW BioNet Database Search Tool*. [Accessed January 2023].

Phillips and Callaghan (2011). The Spot Assessment Technique: A tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus. *Australian Zoologist 35(3)*.

Scotts, D. (2003). *Key Habitats and Corridors for Forest Fauna. Occasional Paper 32.* NSW NPWS.

Copyright and Usage

Appendix A

Biodiversity Database Searches

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Plants in selected area [North: -31.22 West: 151.20 East: 151.40 South: -31.42] returned a total of 99 records of 6 species.
Report generated on 27/01/2023 12:49 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Plantae	Flora	Haloragaceae	9172	*Haloragis exalata subsp. velutina*		Tall Velvet Sea-berry	V	V	2	
Plantae	Flora	Myrtaceae	4134	*Eucalyptus nicholii*		Narrow-leaved Black Peppermint	V	V	5	
Plantae	Flora	Myrtaceae	10888	*Eucalyptus oresbia*		Small-fruited Mountain Gum	V		2	
Plantae	Flora	Orobanchaceae	5954	*Euphrasia arguta*			E4A	CE	81	
Plantae	Flora	Rutaceae	11610	*Asterolasia beckersii*		Dungowan Starbush	E4A	CE	8	
Plantae	Flora	Santalaceae	5871	*Thesium australe*		Austral Toadflax	V	V	1	

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Animals in selected area [North: -31.22 West: 151.20 East: 151.40 South: -31.42] returned a total of 164 records of 12 species.
Report generated on 27/01/2023 12:45 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Hylidae	3168	*Litoria booroolongensis*		Booroolong Frog	E1,P	E	1	
Animalia	Amphibia	Hylidae	3303	*Litoria daviesae*		Davies' Tree Frog	V,P		8	
Animalia	Aves	Strigidae	0248	^^*Ninox strenua*		Powerful Owl	V,P,3		1	
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*		Dusky Woodswallow	V,P		1	
Animalia	Aves	Petroicidae	0380	*Petroica boodang*		Scarlet Robin	V,P		1	
Animalia	Aves	Petroicidae	0382	*Petroica phoenicea*		Flame Robin	V,P		1	
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*		Spotted-tailed Quoll	V,P	E	4	
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*		Koala	E1,P	E	5	
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*		Squirrel Glider	V,P		2	
Animalia	Mammalia	Pseudocheiridae	1133	*Petauroides volans*		Greater Glider	E1,P	E	131	
Animalia	Mammalia	Vespertilionidae	1372	*Falsistrellus tasmaniensis*		Eastern False Pipistrelle	V,P		8	
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*		Greater Broad-nosed Bat	V,P		1	

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Communities in selected area [North: -31.22 West: 151.20 East: 151.40 South: -31.42] returned 0 records for 15 entities.
Report generated on 27/01/2023 1:02 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Community				*Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions*		Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	E3		K	
Community				*Carex Sedgeland of the New England Tableland, Nandewar, Brigalow Belt South and NSW North Coast Bioregions*		Carex Sedgeland of the New England Tableland, Nandewar, Brigalow Belt South and NSW North Coast Bioregions	E3		K	
Community				*Howell Shrublands in the New England Tableland and Nandewar Bioregions*		Howell Shrublands in the New England Tableland and Nandewar Bioregions	E3		P	
Community				*Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*		Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	E3		K	

Community	*Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions*	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	E3		K	
Community	*Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions*	Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions	E3		K	
Community	*Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland*	Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland		CE	K	
Community	*New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands*	New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands		CE	K	
Community	*New England Peppermint (Eucalyptus nova-anglica) Woodland on Basalts and Sediments in the New England Tableland Bioregion*	New England Peppermint (Eucalyptus nova-anglica) Woodland on Basalts and Sediments in the New England Tableland Bioregion	E4B		K	

Community	*Ribbon Gum—Mountain Gum—Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion*	Ribbon Gum—Mountain Gum—Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion	E3		P	
Community	*Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions*	Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions	E3		K	
Community	*Upland Wetlands of the Drainage Divide of the New England Tableland Bioregion*	Upland Wetlands of the Drainage Divide of the New England Tableland Bioregion	E3		P	
Community	*Weeping Myall Woodlands*	Weeping Myall Woodlands		E	K	
Community	*White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and*	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and	E4B		K	
Community	*White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		CE	K	

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 30-Jan-2023

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	41
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	20
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	1000 - 1100km upstream from Ramsar site	In feature area
Riverland	900 - 1000km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	1100 - 1200km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Ben Halls Gap Sphagnum Moss Cool Temperate Rainforest	Critically Endangered	Community may occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area	In buffer area only
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area	In feature area
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	Critically Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community may occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat may occur within area	In buffer area only
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Polytelis swainsonii](#) Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
FROG			
[Litoria booroolongensis](#) Booroolong Frog [1844]	Endangered	Species or species habitat known to occur within area	In feature area
[Mixophyes balbus](#) Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In buffer area only
MAMMAL			
[Chalinolobus dwyeri](#) Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
[Notamacropus parma](#) Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
[Nyctophilus corbeni](#) Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Petauroides volans](#) Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
[Petaurus australis australis](#) Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Petrogale penicillata](#) Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
Arthraxon hispidus			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In feature area
Asterolasia beckersii			
Dungowan Starbush [90354]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Cadellia pentastylis			
Ooline [9828]	Vulnerable	Species or species habitat may occur within area	In feature area
Callistemon pungens			
[55581]	Vulnerable	Species or species habitat may occur within area	In feature area
Cryptostylis hunteriana			
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris pedunculata			
Small Snake Orchid, Two-leaved Golden Moths, Golden Moths, Cowslip Orchid, Snake Orchid [18325]	Endangered	Species or species habitat likely to occur within area	In feature area
Eucalyptus nicholii			
Narrow-leaved Peppermint, Narrow-leaved Black Peppermint [20992]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Haloragis exalata subsp. velutina Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In feature area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area	In feature area
Vincetoxicum forsteri listed as Tylophora linearis [92384]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Uvidicolus sphyrurus Border Thick-tailed Gecko, Granite Belt Thick-tailed Gecko [84578]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Wollumbinia belli Bell's Turtle, Western Sawshell Turtle, Namoi River Turtle, Bell's Saw-shelled Turtle [86071]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat likely to occur within area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [12984]	NSW	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma			
Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Rhipidura rufifrons			
Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Dungowan Dam Project	2020/8655	Controlled Action	Assessment Approach	In feature area
Not controlled action				
Dungowan Dam Detailed Design Geotechnical Investigations	2021/9012	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

Appendix B

Threatened Species Potential Occurrence Assessment

Threatened Species Potential Occurrence Assessment - Overview

A potential of occurrence assessment was completed to assess the likelihood of occurrence of threatened species or populations at the subject site. All threatened biodiversity identified in background research were considered. The assessment is based on the habitat profile for the species and other habitat information in the Threatened Species Profile Database (Environment Energy and Science Group). The assessment also takes into consideration the dates and locations of nearby records and information about species populations in the locality.

Table B1 Threatened Flora Likelihood of Occurrence Criteria

Likelihood	Criteria
Known	The species was observed in the subject site either during the current survey or during another survey less than one year prior.
High	A species has a high likelihood of occurrence if: the subject site contains or forms part of a large area of high-quality suitable habitat that has not been subject to recent disturbance (e.g. fire), the species is known to form a persistent soil seedbank and the species has been recorded recently (within 10 years) in the locality the species is a cryptic flowering species that has been recorded recently (within 10 years) in the locality and has a large area of high-quality potential habitat within the construction footprint that was not seasonally targeted by surveys.
Moderate	A species has a moderate likelihood of occurrence if: the species: i. has a large area of high-quality suitable habitat in the subject site that has not been subject to recent disturbance (e.g. fire) ii. the species is known to form a persistent soil seedbank, but iii. the species has not been recorded recently (within 10 years) in the locality the species: iv. has a small area of high-quality suitable habitat or a large area of marginal habitat in the subject site That has not been subject to recent disturbance (e.g. fire) v. the species is known to form a persistent soil seedbank vi. the species has been recorded recently (within 10 years) in the locality vii. the species is a cryptic flowering species, with a small area of high-quality potential habitat or a large area of marginal habitat within the activity footprint, that was not seasonally targeted by surveys.
Low	A species has a low likelihood of occurrence if: it is not a cryptic species, nor a species known to have a persistent soil seedbank species and was not detected despite targeted searches the species is a cryptic flowering species, with a small area of high-quality potential habitat or a large area of marginal habitat within the activity footprint, that was not seasonally targeted by surveys as the species has not been recorded within 50 years in the locality.
None	Suitable habitat is absent from the subject site.

Table B2 Threatened Flora Potential Occurrence

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Arthraxon hispidus	Hairy Jointgrass	V	V	Moist shady places in or on the edges of rainforest and wet eucalypt forest, often near creeks or swamps.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Asterolasia beckersii	Dungowan Starbush	E	-	Rocky alluvial soil along a creekbank dominated by River Oak (Casuarina cunninghamiana) with or without Manna Gum (Eucalyptus viminalis). Also recorded in locations with overstorey trees dominated by Messmate Stringybark (Eucalyptus obliqua) and Mountain Manna Gum (E. nobilis) with or without Narrow-leaved Peppermint (E. radiata ssp. sejuncta)	None - Suitable habitat is absent from the subject site. Test of significance not required.
Cadellia pentastylis	Ooline	V	V	Forms a closed or open canopy mixing with eucalypt and cypress pine species. There appears to be a strong correlation between the presence of Ooline and low- to medium-nutrient soils of sandy clay or clayey consistencies, with a typical soil profile having a sandy loam surface layer, grading from a light clay to a medium clay with depth.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Callistemon pungens	-	-	V	In or near rocky watercourses, usually in sandy creek beds on granite or sometimes on basalt.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	Does not have well defined habitat and is known from a range of communities, including swamp-heath and woodland.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Dichanthium setosum	Bluegrass	V	V	In NSW, occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Diuris pedunculata	Small Snake Orchid	E	E	Grassy sclerophyll forests, dry sclerophyll woodlands, grassy sclerophyll woodlands, grasslands, riparian areas, and swampy forests.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Eucalyptus nicholii	Narrow-leaved Peppermint	V	V	Grassy or sclerophyllous woodland on shallow relatively infertile soils on shales and slates.	Low - Field surveys did not record the species in the study area. Test of significance not required.
Eucalyptus oresbia	Small-fruited Mountain Gum	V	-	Found at altitudes between 800 and 1100 m in very steep valleys and deeply incised creeklines with primarily south to southwest exposure (i.e. warm yet moist).	Low - Field surveys did not record the species in the study area. Test of significance not required.
Euphrasia arguta	-	CE	CE	Known from three sites in/near Nundle State Forest in eucalypt forest with a mixed grass and shrub understorey. Habitat includes open forest country around Bathurst in subhumid places, grassy country near Bathurst and in meadows near rivers.	Moderate - Field surveys did not record the species in the study area. There is suitable habitat at the study site and this species is known to be cryptic. **Test of significance completed.**
Haloragis exalata subsp. velutina	Tall Velvet Sea-berry	V	V	Damp places near watercourses, also in woodland and steep rocky slopes of gorges.	Low - Field surveys did not record the species in the study area. Test of significance not required.
Pomaderris brunnea	Brown Pomaderris	E	V	Brown Pomaderris grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Prasophyllum sp. Wybong	-	-	CE	Known to occur in open eucalypt woodland and grassland	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Thesium australe	Austral Toadflax	V	V	Grassland or grassy eucalypt woodland where Themeda australis is predominant, on grassy headlands.	Moderate - Field surveys did not record the species in the study area. There is suitable habitat at the study site and this species is known to be cryptic**. Test of significance completed.**
Vincetoxicum forsteri (formally Tylophora linearis)		V	E	*Vincetoxicum forsteri* grows in dense shrublands occasionally overtopped by Callitris glaucophylla and various species of Eucalyptus. Not previously recorded in Northern Rivers CMA area.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.

Table B3 Fauna Likelihood of Occurrence Criteria

Likelihood	Criteria
Recorded	The species was observed in the study area during the current survey
High	It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (ie for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (10 km) and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration.
Moderate	Potential habitat is present in the study area. Species unlikely to maintain sedentary populations; however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the study area and has not been recorded recently in the locality (10 km). It may be an occasional visitor, but habitat similar to the study area is widely distributed in the local area, meaning that the species is not dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the study area or the species are a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded.
None	Suitable habitat is absent from the study area. Based on a field assessment of the habitat constraints or microhabitats on the study area , the habitat is identified as being substantially degraded such that the species is unlikely to utilise the study area (or specific vegetation zones), or an expert report that is prepared that states the species is unlikely to be present on the study area or specific vegetation zones.

Table B4 Threatened Fauna Potential Occurrence

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Litoria booroolongensis	Booroolong Frog	E	E	Permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.	None - Suitable habitat is absent from the study area. Test of significance not required.
Litoria daviesae	Davies' Tree Frog	V	-	Davies' Tree Frog occurs in permanent, slow-flowing small streams above 400 m elevation, mostly in the headwaters of eastern-flowing streams (although it does occur in the headwaters of the western-flowing Peel River).	None - Suitable habitat is absent from the study area. Test of significance not required.
Mixophyes balbus	Stuttering Frog	E	V	Cool rainforest, moist eucalypt forest and occasionally along creeks in dry eucalypt forest. Typically, at elevations between 200 and 1420m above sea level in their northern range.	Low - No BioNet records within the locality. No waterways occur at the test pit locations. Test of significance not required.
Anthochaera phrygia	Regent Honeyeater	CE	CE	Dry open forest and woodland with an abundance of nectar-producing eucalypts, particularly box-ironbark woodland, swamp mahogany forests, and riverine sheoak woodlands.	Moderate – Potential foraging and nesting habitat available. No BioNet records within the locality. **Test of significance completed**.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Woodlands and dry open sclerophyll forests, usually dominated by eucalypts; also recorded in shrublands, heathlands and various modified habitats.	Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.
Botaurus poiciloptilus	Australasian Bittern	E	E	Permanent freshwater wetlands with tall dense vegetation, particularly bullrushes and spikerushes.	None - Suitable habitat is absent from the study area. Test of significance not required
Calidris ferruginea	Curlew Sandpiper	E	CE	Tidal mudflats, sandy ocean shores and occasionally inland freshwater or salt-lakes.	None - Suitable habitat is absent from the study area. Test of significance not required

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	Wetter forests and woodlands, timbered watercourses, coastal scrub.	Low – Poor quality habitat for the subject species. No BioNet records within the locality. Test of significance not required.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	Sheoaks in coastal forests and woodlands, timbered watercourses, and moist and dry eucalypt forests of the coast and the Great Divide up to 1,000 m.	Low - Lack of appropriate feed trees. No BioNet records within the locality. Test of significance not required.
Erythrotriorchis radiatus	Red Goshawk	CE	V	Open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water. Typically found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers. Population in NSW is naturally small (probably only one pair), and lies at extreme of the natural range of the species in Australia.	Low - No BioNet records within the locality. Preferred habitat is absent from the study area. Test of significance not required.
Falco hypoleucos	Grey Falcon	E	V	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range.	Low - No BioNet records within the locality. Site is outside of its known and predicted ranges. Test of significance not required.
Grantiella picta	Painted Honeyeater	V	V	Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. Specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.	Moderate – Foraging and nesting habitat available within the site. No BioNet records within the locality. **Test of significance completed**.
Hirundapus caudacutus	White-throated Needletail	-	V	Most often recorded aerial foraging above wooded areas, including open forest and rainforest, and	Low – potential marginal foraging habitat available. The species may be an

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
				may also fly between trees or in clearings, below the canopy. Breeding does not occur in Australia.	occasional visitor to the site but is unlikely to be dependent on available habitat. No BioNet records within the locality. Test of significance not required.
Lathamus discolor	Swift Parrot	E	CE	On mainland Australia foraging occurs where eucalypts are flowering profusely or where abundant lerp infestations occur. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Forest Red Gum E. tereticornis, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Inland Grey Box E. microcarpa, Grey Box E. moluccana, Blackbutt E. pilularis and Yellow Box E. melliodora.	Moderate – Potential good quality foraging habitat available with preferred feed trees. No BioNet records within the locality. **Test of significance completed**.
Ninox strenua	Powerful Owl	V	-	Woodland and open forest to tall moist forest and rainforest. Requires large tracts of forest or woodland habitat but may also occur in fragmented landscapes.	Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.
Numenius madagascariensis	Eastern Curlew	-	CE	Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats and sometimes saltmarsh of sheltered coasts.	None - Suitable habitat is absent from the study area. Test of significance not required.
Petroica boodang	Scarlet Robin	V	-	Dry eucalypt forests and woodlands with an open and grassy understorey with few scattered shrubs. Both mature and regrowth vegetation are utilised; habitat usually contains abundant logs and fallen timber.	Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.
Petroica phoenicea	Flame Robin	V	-	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes; prefers clearings or areas with open understoreys. Breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense.	Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
				In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains).	
Polytelis swainsonii	Superb Parrot	V	V	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.	Low – Outside of known and predicted ranges for the species. No BioNet records within the locality. Test of significance not required.
Rostratula australis	Australian Painted Snipe	E	E	Well-vegetated shallows and margins of wetlands, dams, sewage ponds, wet pastures, marshy areas, irrigation systems, lignum, tea-tree scrub, and open timber.	None - Suitable habitat is absent from the study area. Test of significance not required.
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Near cave entrances and crevices in cliffs.	Low - No BioNet records within the locality. Test of significance not required.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Dry and moist eucalypt forests and rainforests, fallen hollow logs, large rocky outcrops.	Moderate – Potential foraging habitat available. **Test of significance completed**.
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	Moist and dry eucalypt forest and rainforest, particularly at high elevations.	Moderate – Potential foraging and roosting habitat available. **Test of significance completed**.
Macropus parma	Parma Wallaby	V	V	Moist eucalypt forest with thick shrubby understorey, often with nearby grassy areas and rainforest margins.	Low – Outside of known range for the species. No BioNet records within the locality. Test of significance not required.
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	Mallee, bulloke and box eucalypt dominated communities, more common in box/ironbark/cypress-pine vegetation, inhabiting tree hollows, crevices, and under loose bark.	Moderate - Good potential foraging and rooting habitat available. No BioNet records within the locality.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
					Test of significance completed.
Petauroides volans	Greater Glider	-	E	Ranges and coastal plains of eastern Australia, where it inhabits a variety of eucalypt forests and woodlands.	Moderate - Potential foraging habitat available. **Test of significance completed**.
Petaurus australis australis	Yellow-bellied Glider (south-eastern)	V	V	Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Dens in tree hollows of large trees, often in family groups. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	Low - No BioNet records within the locality. Test of significance not required.
Petaurus norfolcensis	Squirrel Glider	V	-	Blackbutt, bloodwood and ironbark eucalypt forest with heath understorey in coastal areas, and box-ironbark woodlands and River Red Gum forest inland.	Moderate - Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.
Petrogale penicillata	Brush-tailed Rock Wallaby	E	V	North-facing cliffs and dry eucalypt forest and woodland, inhabiting rock crevices, caves, overhangs during the day, and foraging in grassy areas nearby at night.	Low - No BioNet records within the locality. Test of significance not required.
Phascolarctos cinereus	Koala	V	E	Appropriate food trees in forests and woodlands, and treed urban areas.	Moderate – Appropriate food trees are readily available at the site. **Test of significance completed**.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Low - No BioNet records within the locality. Test of significance not required.
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	Woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.	Moderate – Potential foraging and roosting

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
					habitat available. **Test of significance completed**.
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (Themeda australis).	Low - No BioNet records within the locality. Test of significance not required.
Myuchelys bellii	Bells Turtle	E	V	Upper reaches and smaller tributaries of major rivers flowing through granitic bedrock, preferring narrow stretches of river, 30 to 40 m wide, with pools up to 3 m deep, and sandy and rocky. Riverbeds, with small beds of weed.	None - Suitable habitat is absent from the study area. Test of significance not required
Uvidicolus sphyrurus	Border Thick-tailed Gecko	V	V	Dry sclerophyll open forest and woodland associated with outcrops of granite, basalt, sandstone and metamorphic rocks.	Low - No BioNet records within the locality. Test of significance not required.

Appendix C

Tests of Significance (BC Act)

Assessment of Significance for Threatened Flora

Flora:

- Austral Toadflax
- *Euphrasia arguta*

The study area habitat values and extent of local population per species/species group are detailed below. To minimise repetition, the responses to the five-part tests are structured as follows:

Part (a), (c), (d) and (e) are answered per species or as a collective group of species depending on the nature of impacts.

Part (b) deals specifically with threatened ecological communities, and hence is not relevant to the subject threatened species assessment.

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,

Austral Toadflax (*Thesium australe*)

Austral Toadflax is a small, straggling herb to 40 cm tall. Leaves are pale green to yellow-green, somewhat succulent, 1 - 4 cm long and 0.5 - 1.5 mm wide. Flowers are minute and white, emerging where the leaves meet the stems and appearing in spring. The fruit is small and nut-like, developing in summer. This species is often hidden amongst grasses and occurs in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands.

Threatening processes for this species include:
- Loss and degradation of habitat.
- Grazing and trampling by domestic stock.
- Weed invasion from morning glory, asparagus fern, and buffalo grass.
- Removal of important individuals via Road widening, straightening and maintenance.
- Frequent fire, or fire during the active growth period.
- Rabbits grazing on this species.
- Weed control activities such as slashing, trampling and overspray.

Euphrasia arguta

Euphrasia arguta is an erect annual herb ranging in height from 20-35 cm. Collectively, the *Euphrasia* are commonly known as 'eyebrights'. Its branches are densely covered with stiff hairs and the leaf margins usually have 2-4 pairs of teeth. The flowers vary in colour from white to lilac with yellow, and are borne on flower spikes of 50 to 90 flowers. Historically, *Euphrasia arguta* has only been recorded from relatively few places within an area extending from Sydney to Bathurst. *Euphrasia arguta* was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008.

Threatening processes for this species include:
- Restricted distribution.
- Forestry operations.
- Road maintenance activities, including clearing and herbicide use.
- Clearing and disturbance of native vegetation.
- Grazing and trampling by domestic stock.
- Grazing and trampling by feral herbivores.

- Phytophthora infection.
- Habitat infestation by tree of heaven, Leucanthemum vulgare and other invasive weeds.

Potential Impacts of the Activity

The Activity would result in the direct loss of up to 120 m^2 of good condition PCT 3521 - *Northwest White Box Woodland* in the road reserve, as potential habitat for the subject species. While no occurrence of the subject species were recorded in the site survey, these species are cryptic and often difficult to locate (particularly when not in flower). On a precautionary basis, the species have been assumed to be present at the site.

Large areas of alternative habitat of similar or better quality occurs adjacent to the site and the broader locality, that would not be directly impacted by the Activity. Habitat for these species in a local context would not be significantly affected by the works. The Activity would not significantly contribute to risk of competition by weeds with the implementation of safeguards such as '*Saving Our Species Hygiene Guidelines*', which would reduce the risk of weed material or plant pathogens introduced to the site.

It is considered unlikely that an adverse effect on the distribution of the subject species would occur such that a viable local population of either 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,

N/A.

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

The Activity would result in the direct loss of up to approximately 120 m^2 of good condition PCT 3521 in the road reserve, that is potential habitat for the subject species.

(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

Habitat at the sites is already fragmented from previous historic clearing of the road reserve. The Activity would result in a minor increase in the width of the cleared corridor of Nowendoc Road at the four sites. The Activity would not significantly affect the potential for cross-pollination to occur between individuals of the subject species. Considering the above, no significant fragmentation or isolation of habitat for the subject species is likely.

(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 habitat affected is in good condition and occurs within a previously disturbed road reserve. Austral Toadflax has not been recorded at the site and low numbers of BioNet records occur within the search area. While *Euphrasia arguta* has not been recorded at the site 81 records occur within the search area. The known habitat locally is significant for *Euphrasia arguta*. Given the minor area (120 m^2) of disturbance to potential habitat for the subject species, and the availability of similar or better-quality

habitat within the broader locality; the Activity is unlikely to significantly affect the long-term survival of the subject species within 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),

No areas of outstanding biodiversity value have been declared in Tamworth Regional LGA.

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 or ecological communities. The current list of KTP under the BC Act, and whether the Activity is recognised as a KTP is shown in **Table C1**.

Table C1 Key Threatening Processes

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process for threatened flora?*		
	Likely	*Possible*	*Unlikely*
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change			✓
Bushrock removal			✓
Clearing of native vegetation	✓		
Competition and grazing by the feral European Rabbit (*Oryctolagus cuniculus*)			✓
Competition and habitat degradation by feral goats (*Capra hircus*)			✓
Competition from feral honeybees (*Apis mellifera*)			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest eucalypt dieback associated with over-abundant psyllids and bell miners			✓
Habitat degradation and loss by Feral Horses, *Equus caballus*			✓
Herbivory and environmental degradation caused by feral deer			✓

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process for threatened flora?*		
	Likely	*Possible*	*Unlikely*
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition			✓
Importation of red imported fire ants (*Solenopsis invicta*)			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)			✓
Invasion and establishment of the Cane Toad (*Bufo marinus*)			✓
Invasion, establishment and spread of Lantana (*Lantana camara*)			✓
Invasion of native plant communities by African Olive (*Olea europaea L. subsp. cuspidata*)			✓
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of the Yellow Crazy Ant (*Anoplolepis gracilipes*) into NSW			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss of hollow-bearing trees		✓	
Loss or degradation (or both) of sites used for hill-topping by butterflies			✓
Predation and hybridisation by feral dogs (*Canis lupus familiaris*)			✓
Predation by the European Red Fox (*Vulpes vulpes*)			✓

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process for threatened flora?*		
	Likely	*Possible*	*Unlikely*
Predation by the feral cat (*Felis catus*)			✓
Predation by *Gambusia holbrooki* (Plague Minnow or Mosquito Fish)			✓
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)			✓
Removal of dead wood and dead trees			✓

Clearing of native vegetation is the only KTP likely to be contributed to by the Activity. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long-term modification, of the structure, composition and ecological function of stand or stands.

Considering the relatively small area of native vegetation to be removed, it is unlikely that the Activity would contribute significantly to this KTP.

The Activity is such that no other KTPs are considered likely to be substantially contributed to, especially with effective implementation of the mitigation measures in this report.

Overall, although the action proposed constitutes or is part of a key threatening process, the minor nature of the Activity is such that this contribution is very small and insignificant within the broader locality.

Conclusion

It is considered unlikely that the local population of Austral Toadflax or *Euphrasia arguta* would be placed at significant risk of extinction as a result of the Activity.

Assessment of Significance for Threatened Fauna

Fauna:

Birds

- Regent Honeyeater.
- Dusky Woodswallow.
- Painted Honeyeater.
- Swift Parrot.
- Powerful Owl.
- Scarlet Robin.
- Flame Robin.

Mammals

- Spotted-tailed Quoll.
- Eastern False Pipistrelle.
- Corben's Long-eared Bat.
- Greater Glider.
- Squirrel Glider.
- Koala.
- Greater Broad-nosed Bat.

To minimise repetition, the responses to the five-part tests are structured as follows:

Part (a), (c), (d) and (e) are answered per species or as a collective group of species depending on the nature of impacts.

Part (b) deals specifically with threatened ecological communities, and hence is not relevant to the subject threatened species assessment.

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,

Potential Direct Impacts from the Activity include:

- The trimming or removal of native trees and vegetation (120 m^2 of native vegetation).
- Direct mortality or injury to fauna during vegetation clearing.

Potential Indirect Impacts form the Activity on threatened species include:

- Fauna avoidance in proximity to the work area due to noise and human presence during construction and human presence during the construction phase of the project.
- Habitat degradation of adjacent habitat due to potential clearing phase impacts (e.g., erosion and sedimentation impacts or chemical spills).
- Unintentional introduction or spread or introduction of weeds.
- Unintentional introduction or spread of propagules or plant disease by way of plant and machinery.

For the purposes of this assessment the local population of threatened fauna species is defined as the population within the study area and within a two-kilometre radius of the site where vegetation is contiguous for all the subject species.

Vegetation to be removed is the same as the vegetation immediately adjacent to the site which would remain and continue to provide suitable habitat values at the site. The Activity represents a minor loss/ modification of potential habitat for:

Birds

- Regent Honeyeater – Foraging and nesting habitat.
- Dusky Woodswallow – Foraging and nesting habitat.
- Painted Honeyeater – Foraging and nesting habitat.
- Swift Parrot – Foraging habitat.
- Powerful Owl – Foraging and nesting habitat.
- Scarlet Robin – Foraging and nesting habitat.
- Flame Robin – Foraging and nesting habitat.

Mammals

- Spotted-tailed Quoll – Foraging habitat.
- Eastern False Pipistrelle – Foraging and non-breeding roost habitat.
- Corben's Long-eared Bat – Foraging and non-breeding roost habitat.
- Greater Glider – Foraging habitat.
- Squirrel Glider – Foraging and nesting habitat.
- Koala – Foraging habitat.
- Greater Broad-nosed Bat – Foraging and non-breeding roost habitat.

It is considered that the Activity would be unlikely to have an adverse effect on the life cycle of the listed threatened species such that a viable local population of the species would 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,

N/A.

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

The Activity would result in the direct loss/ modification of 120 m^2 of native vegetation within the existing road reserve. The local landscape is in good condition but has been historically cleared or modified for roads.

Threatened fauna habitat impacts are as follows:

The Activity represents a negative incremental, although relatively minor loss/modification of potential habitat for:

Birds

- Regent Honeyeater – Minor loss/ modification of foraging and nesting habitat.
- Dusky Woodswallow – Minor loss/ modification of foraging and nesting habitat.
- Painted Honeyeater – Minor loss/ modification of foraging and nesting habitat.
- Swift Parrot – Minor loss/ modification of foraging habitat.
- Powerful Owl – Minor loss/ modification of foraging and nesting habitat.
- Scarlet Robin – Minor loss/ modification of foraging and nesting habitat.
- Flame Robin – Minor loss/ modification of foraging and nesting habitat.

Mammals

- Spotted-tailed Quoll – Minor loss/ modification of foraging habitat.
- Eastern False Pipistrelle – Minor loss/ modification of foraging and non-breeding roost habitat.
- Corben's Long-eared Bat – Minor loss/ modification of foraging and non-breeding roost habitat.
- Greater Glider – Minor loss/ modification of foraging habitat.
- Squirrel Glider – Minor loss/ modification of foraging and nesting habitat.
- Koala – Minor loss/ modification of foraging habitat.
- Greater Broad-nosed Bat – Minor loss/ modification of foraging and non-breeding roost habitat.

While the habitat loss is negative, the Activity would impact <0.01% of native vegetation available to the local population of the subject species which is a minor amount. The Activity is unlikely to have any significant or long-term impacts on foraging habitat or breeding territory defended by the subject fauna species.

(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

The Activity would result in minor disturbance to native vegetation within the cleared corridor of the subject road. All the subject threatened species would have no difficulty in accessing habitats dissected by the road and therefore no area of habitat is likely to become substantially fragmented or isolated from other areas of habitat as a result of the Activity.

(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 habitats proposed for removal are in a high condition state with some disturbance present on the road verge due to previous roadworks and historic clearing. The removal of minor vegetation within the road reserve is of limited importance for the subject species, considering that alternative habitat of equivalent quality within the broader locality and would not be impacted by the Activity.

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),

No areas of outstanding biodiversity value have been declared in Tamworth Regional LGA.

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 or ecological communities. The current list of KTP under the BC Act, and whether the Activity is recognised as a KTP is shown in **Table C2**.

Table C2 Key Threatening Processes

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change			✓
Bushrock removal		✓	
Clearing of native vegetation	✓		
Competition and grazing by the feral European Rabbit (*Oryctolagus cuniculus*)			✓
Competition and habitat degradation by feral goats (*Capra hircus*)			✓
Competition from feral honeybees (*Apis mellifera*)			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest eucalypt dieback associated with over-abundant psyllids and bell miners			✓
Habitat degradation and loss by Feral Horses, *Equus caballus*			✓
Herbivory and environmental degradation caused by feral deer			✓
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition			✓
Importation of red imported fire ants (*Solenopsis invicta*)			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)			✓
Invasion and establishment of the Cane Toad (*Bufo marinus*)			✓
Invasion, establishment and spread of Lantana (*Lantana camara*)			✓

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Invasion of native plant communities by African Olive (*Olea europaea L. subsp. cuspidata*)			✓
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of the Yellow Crazy Ant (*Anoplolepis gracilipes*) into NSW			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss of hollow-bearing trees		✓	
Loss or degradation (or both) of sites used for hill-topping by butterflies			✓
Predation and hybridisation by feral dogs (*Canis lupus familiaris*)			✓
Predation by the European Red Fox (*Vulpes vulpes*)			✓
Predation by the feral cat (*Felis catus*)			✓
Predation by *Gambusia holbrooki* (Plague Minnow or Mosquito Fish)			✓
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)			✓
Removal of dead wood and dead trees	✓		

Clearing of native vegetation and removal of dead wood and dead trees are the only KTPs likely to be contributed to by the Activity.

Considering the small area of native vegetation to be removed, it is unlikely that the Activity would contribute significantly to this KTP to the point of placing any local threatened species populations at risk of extinction.

Removal of dead wood and trees would be limited to the proposed works extent and constitute a minor impact. It is unlikely that the Activity would contribute significantly to this KTP to the point of placing any local threatened species populations at risk of extinction.

The Activity is such that no other KTPs are considered likely to be substantially contributed to, especially with effective implementation of the mitigation measures in this report.

Overall, the degree that the Activity would contribute to any threatening process is not considered likely to place the local population of any of the subject species at significant risk of extinction.

Conclusion

It is considered unlikely that the local population of any of the subject species would be significantly impacted by the Activity.

Appendix B

Threatened Species Potential Occurrence Assessment

Threatened Species Potential Occurrence Assessment - Overview

A potential of occurrence assessment was completed to assess the likelihood of occurrence of threatened species or populations at the subject site. All threatened biodiversity identified in background research were considered. The assessment is based on the habitat profile for the species and other habitat information in the Threatened Species Profile Database (Environment Energy and Science Group). The assessment also takes into consideration the dates and locations of nearby records and information about species populations in the locality.

Table B1 Threatened Flora Likelihood of Occurrence Criteria

Likelihood	Criteria
Known	The species was observed in the subject site either during the current survey or during another survey less than one year prior.
High	A species has a high likelihood of occurrence if: the subject site contains or forms part of a large area of high-quality suitable habitat that has not been subject to recent disturbance (e.g. fire), the species is known to form a persistent soil seedbank and the species has been recorded recently (within 10 years) in the locality the species is a cryptic flowering species that has been recorded recently (within 10 years) in the locality and has a large area of high-quality potential habitat within the construction footprint that was not seasonally targeted by surveys.
Moderate	A species has a moderate likelihood of occurrence if: the species: i. has a large area of high-quality suitable habitat in the subject site that has not been subject to recent disturbance (e.g. fire) ii. the species is known to form a persistent soil seedbank, but iii. the species has not been recorded recently (within 10 years) in the locality the species: iv. has a small area of high-quality suitable habitat or a large area of marginal habitat in the subject site That has not been subject to recent disturbance (e.g. fire) v. the species is known to form a persistent soil seedbank vi. the species has been recorded recently (within 10 years) in the locality vii. the species is a cryptic flowering species, with a small area of high-quality potential habitat or a large area of marginal habitat within the activity footprint, that was not seasonally targeted by surveys.
Low	A species has a low likelihood of occurrence if: it is not a cryptic species, nor a species known to have a persistent soil seedbank species and was not detected despite targeted searches the species is a cryptic flowering species, with a small area of high-quality potential habitat or a large area of marginal habitat within the activity footprint, that was not seasonally targeted by surveys as the species has not been recorded within 50 years in the locality.
None	Suitable habitat is absent from the subject site.

Table B2 Threatened Flora Potential Occurrence

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Arthraxon hispidus	Hairy Jointgrass	V	V	Moist shady places in or on the edges of rainforest and wet eucalypt forest, often near creeks or swamps.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Asterolasia beckersii	Dungowan Starbush	E	-	Rocky alluvial soil along a creekbank dominated by River Oak (Casuarina cunninghamiana) with or without Manna Gum (Eucalyptus viminalis). Also recorded in locations with overstorey trees dominated by Messmate Stringybark (Eucalyptus obliqua) and Mountain Manna Gum (E. nobilis) with or without Narrow-leaved Peppermint (E. radiata ssp. sejuncta)	None - Suitable habitat is absent from the subject site. Test of significance not required.
Cadellia pentastylis	Ooline	V	V	Forms a closed or open canopy mixing with eucalypt and cypress pine species. There appears to be a strong correlation between the presence of Ooline and low- to medium-nutrient soils of sandy clay or clayey consistencies, with a typical soil profile having a sandy loam surface layer, grading from a light clay to a medium clay with depth.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Callistemon pungens	-	-	V	In or near rocky watercourses, usually in sandy creek beds on granite or sometimes on basalt.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	Does not have well defined habitat and is known from a range of communities, including swamp-heath and woodland.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Dichanthium setosum	Bluegrass	V	V	In NSW, occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Diuris pedunculata	Small Snake Orchid	E	E	Grassy sclerophyll forests, dry sclerophyll woodlands, grassy sclerophyll woodlands, grasslands, riparian areas, and swampy forests.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Eucalyptus nicholii	Narrow-leaved Peppermint	V	V	Grassy or sclerophyllous woodland on shallow relatively infertile soils on shales and slates.	Low - Field surveys did not record the species in the study area. Test of significance not required.
Eucalyptus oresbia	Small-fruited Mountain Gum	V	-	Found at altitudes between 800 and 1100 m in very steep valleys and deeply incised creeklines with primarily south to southwest exposure (i.e. warm yet moist).	Low - Field surveys did not record the species in the study area. Test of significance not required.
Euphrasia arguta	-	CE	CE	Known from three sites in/near Nundle State Forest in eucalypt forest with a mixed grass and shrub understorey. Habitat includes open forest country around Bathurst in subhumid places, grassy country near Bathurst and in meadows near rivers.	Moderate - Field surveys did not record the species in the study area. There is suitable habitat at the study site and this species is known to be cryptic. **Test of significance completed.**
Haloragis exalata subsp. velutina	Tall Velvet Sea-berry	V	V	Damp places near watercourses, also in woodland and steep rocky slopes of gorges.	Low - Field surveys did not record the species in the study area. Test of significance not required.
Pomaderris brunnea	Brown Pomaderris	E	V	Brown Pomaderris grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.
Prasophyllum sp. Wybong	-	-	CE	Known to occur in open eucalypt woodland and grassland	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Thesium australe	Austral Toadflax	V	V	Grassland or grassy eucalypt woodland where Themeda australis is predominant, on grassy headlands.	Moderate - Field surveys did not record the species in the study area. There is suitable habitat at the study site and this species is known to be cryptic**. Test of significance completed.**
Vincetoxicum forsteri (formally Tylophora linearis)		V	E	*Vincetoxicum forsteri* grows in dense shrublands occasionally overtopped by Callitris glaucophylla and various species of Eucalyptus. Not previously recorded in Northern Rivers CMA area.	Low - Field surveys did not record the species in the study area. No BioNet records within the locality. Test of significance not required.

Table B3 Fauna Likelihood of Occurrence Criteria

Likelihood	Criteria
Recorded	The species was observed in the study area during the current survey
High	It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (ie for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (10 km) and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration.
Moderate	Potential habitat is present in the study area. Species unlikely to maintain sedentary populations; however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the study area and has not been recorded recently in the locality (10 km). It may be an occasional visitor, but habitat similar to the study area is widely distributed in the local area, meaning that the species is not dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the study area or the species are a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded.
None	Suitable habitat is absent from the study area. Based on a field assessment of the habitat constraints or microhabitats on the study area , the habitat is identified as being substantially degraded such that the species is unlikely to utilise the study area (or specific vegetation zones), or an expert report that is prepared that states the species is unlikely to be present on the study area or specific vegetation zones.

Table B4 Threatened Fauna Potential Occurrence

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Litoria booroolongensis	Booroolong Frog	E	E	Permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.	None - Suitable habitat is absent from the study area. Test of significance not required.
Litoria daviesae	Davies' Tree Frog	V	-	Davies' Tree Frog occurs in permanent, slow-flowing small streams above 400 m elevation, mostly in the headwaters of eastern-flowing streams (although it does occur in the headwaters of the western-flowing Peel River).	None - Suitable habitat is absent from the study area. Test of significance not required.
Mixophyes balbus	Stuttering Frog	E	V	Cool rainforest, moist eucalypt forest and occasionally along creeks in dry eucalypt forest. Typically, at elevations between 200 and 1420m above sea level in their northern range.	Low - No BioNet records within the locality. No waterways occur at the test pit locations. Test of significance not required.
Anthochaera phrygia	Regent Honeyeater	CE	CE	Dry open forest and woodland with an abundance of nectar-producing eucalypts, particularly box-ironbark woodland, swamp mahogany forests, and riverine sheoak woodlands.	Moderate – Potential foraging and nesting habitat available. No BioNet records within the locality. **Test of significance completed**.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Woodlands and dry open sclerophyll forests, usually dominated by eucalypts; also recorded in shrublands, heathlands and various modified habitats.	Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.
Botaurus poiciloptilus	Australasian Bittern	E	E	Permanent freshwater wetlands with tall dense vegetation, particularly bullrushes and spikerushes.	None - Suitable habitat is absent from the study area. Test of significance not required
Calidris ferruginea	Curlew Sandpiper	E	CE	Tidal mudflats, sandy ocean shores and occasionally inland freshwater or salt-lakes.	None - Suitable habitat is absent from the study area. Test of significance not required

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	Wetter forests and woodlands, timbered watercourses, coastal scrub.	Low – Poor quality habitat for the subject species. No BioNet records within the locality. Test of significance not required.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	Sheoaks in coastal forests and woodlands, timbered watercourses, and moist and dry eucalypt forests of the coast and the Great Divide up to 1,000 m.	Low - Lack of appropriate feed trees. No BioNet records within the locality. Test of significance not required.
Erythrotriorchis radiatus	Red Goshawk	CE	V	Open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water. Typically found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers. Population in NSW is naturally small (probably only one pair), and lies at extreme of the natural range of the species in Australia.	Low - No BioNet records within the locality. Preferred habitat is absent from the study area. Test of significance not required.
Falco hypoleucos	Grey Falcon	E	V	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range.	Low - No BioNet records within the locality. Site is outside of its known and predicted ranges. Test of significance not required.
Grantiella picta	Painted Honeyeater	V	V	Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. Specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.	Moderate – Foraging and nesting habitat available within the site. No BioNet records within the locality. **Test of significance completed**.
Hirundapus caudacutus	White-throated Needletail	-	V	Most often recorded aerial foraging above wooded areas, including open forest and rainforest, and	Low – potential marginal foraging habitat available. The species may be an

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
				may also fly between trees or in clearings, below the canopy. Breeding does not occur in Australia.	occasional visitor to the site but is unlikely to be dependent on available habitat. No BioNet records within the locality. Test of significance not required.
Lathamus discolor	Swift Parrot	E	CE	On mainland Australia foraging occurs where eucalypts are flowering profusely or where abundant lerp infestations occur. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Forest Red Gum E. tereticornis, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Inland Grey Box E. microcarpa, Grey Box E. moluccana, Blackbutt E. pilularis and Yellow Box E. melliodora.	Moderate – Potential good quality foraging habitat available with preferred feed trees. No BioNet records within the locality. **Test of significance completed**.
Ninox strenua	Powerful Owl	V	-	Woodland and open forest to tall moist forest and rainforest. Requires large tracts of forest or woodland habitat but may also occur in fragmented landscapes.	Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.
Numenius madagascariensis	Eastern Curlew	-	CE	Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats and sometimes saltmarsh of sheltered coasts.	None - Suitable habitat is absent from the study area. Test of significance not required.
Petroica boodang	Scarlet Robin	V	-	Dry eucalypt forests and woodlands with an open and grassy understorey with few scattered shrubs. Both mature and regrowth vegetation are utilised; habitat usually contains abundant logs and fallen timber.	Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.
Petroica phoenicea	Flame Robin	V	-	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes; prefers clearings or areas with open understoreys. Breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense.	Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
				In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains).	
Polytelis swainsonii	Superb Parrot	V	V	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.	Low – Outside of known and predicted ranges for the species. No BioNet records within the locality. Test of significance not required.
Rostratula australis	Australian Painted Snipe	E	E	Well-vegetated shallows and margins of wetlands, dams, sewage ponds, wet pastures, marshy areas, irrigation systems, lignum, tea-tree scrub, and open timber.	None - Suitable habitat is absent from the study area. Test of significance not required.
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Near cave entrances and crevices in cliffs.	Low - No BioNet records within the locality. Test of significance not required.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Dry and moist eucalypt forests and rainforests, fallen hollow logs, large rocky outcrops.	Moderate – Potential foraging habitat available. **Test of significance completed**.
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	Moist and dry eucalypt forest and rainforest, particularly at high elevations.	Moderate – Potential foraging and roosting habitat available. **Test of significance completed**.
Macropus parma	Parma Wallaby	V	V	Moist eucalypt forest with thick shrubby understorey, often with nearby grassy areas and rainforest margins.	Low – Outside of known range for the species. No BioNet records within the locality. Test of significance not required.
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	Mallee, bulloke and box eucalypt dominated communities, more common in box/ironbark/cypress-pine vegetation, inhabiting tree hollows, crevices, and under loose bark.	Moderate - Good potential foraging and rooting habitat available. No BioNet records within the locality.

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
					Test of significance completed.
Petauroides volans	Greater Glider	-	E	Ranges and coastal plains of eastern Australia, where it inhabits a variety of eucalypt forests and woodlands.	Moderate - Potential foraging habitat available. **Test of significance completed**.
Petaurus australis australis	Yellow-bellied Glider (south-eastern)	V	V	Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Dens in tree hollows of large trees, often in family groups. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	Low - No BioNet records within the locality. Test of significance not required.
Petaurus norfolcensis	Squirrel Glider	V	-	Blackbutt, bloodwood and ironbark eucalypt forest with heath understorey in coastal areas, and box-ironbark woodlands and River Red Gum forest inland.	Moderate - Moderate - Potential foraging and nesting habitat available. **Test of significance completed**.
Petrogale penicillata	Brush-tailed Rock Wallaby	E	V	North-facing cliffs and dry eucalypt forest and woodland, inhabiting rock crevices, caves, overhangs during the day, and foraging in grassy areas nearby at night.	Low - No BioNet records within the locality. Test of significance not required.
Phascolarctos cinereus	Koala	V	E	Appropriate food trees in forests and woodlands, and treed urban areas.	Moderate – Appropriate food trees are readily available at the site. **Test of significance completed**.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Low - No BioNet records within the locality. Test of significance not required.
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	Woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.	Moderate – Potential foraging and roosting

Scientific Name	Common Name	BC Act	EPBC Act	Habitat Requirement	Potential Occurrence/ Subject Species
					habitat available. **Test of significance completed**.
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (Themeda australis).	Low - No BioNet records within the locality. Test of significance not required.
Myuchelys bellii	Bells Turtle	E	V	Upper reaches and smaller tributaries of major rivers flowing through granitic bedrock, preferring narrow stretches of river, 30 to 40 m wide, with pools up to 3 m deep, and sandy and rocky. Riverbeds, with small beds of weed.	None - Suitable habitat is absent from the study area. Test of significance not required
Uvidicolus sphyrurus	Border Thick-tailed Gecko	V	V	Dry sclerophyll open forest and woodland associated with outcrops of granite, basalt, sandstone and metamorphic rocks.	Low - No BioNet records within the locality. Test of significance not required.

Appendix C

Tests of Significance (BC Act)

Assessment of Significance for Threatened Flora

Flora:

- Austral Toadflax
- *Euphrasia arguta*

The study area habitat values and extent of local population per species/species group are detailed below. To minimise repetition, the responses to the five-part tests are structured as follows:

Part (a), (c), (d) and (e) are answered per species or as a collective group of species depending on the nature of impacts.

Part (b) deals specifically with threatened ecological communities, and hence is not relevant to the subject threatened species assessment.

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,

Austral Toadflax (*Thesium australe*)

Austral Toadflax is a small, straggling herb to 40 cm tall. Leaves are pale green to yellow-green, somewhat succulent, 1 - 4 cm long and 0.5 - 1.5 mm wide. Flowers are minute and white, emerging where the leaves meet the stems and appearing in spring. The fruit is small and nut-like, developing in summer. This species is often hidden amongst grasses and occurs in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands.

Threatening processes for this species include:
- Loss and degradation of habitat.
- Grazing and trampling by domestic stock.
- Weed invasion from morning glory, asparagus fern, and buffalo grass.
- Removal of important individuals via Road widening, straightening and maintenance.
- Frequent fire, or fire during the active growth period.
- Rabbits grazing on this species.
- Weed control activities such as slashing, trampling and overspray.

Euphrasia arguta

Euphrasia arguta is an erect annual herb ranging in height from 20-35 cm. Collectively, the *Euphrasia* are commonly known as 'eyebrights'. Its branches are densely covered with stiff hairs and the leaf margins usually have 2-4 pairs of teeth. The flowers vary in colour from white to lilac with yellow, and are borne on flower spikes of 50 to 90 flowers. Historically, *Euphrasia arguta* has only been recorded from relatively few places within an area extending from Sydney to Bathurst. *Euphrasia arguta* was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008.

Threatening processes for this species include:
- Restricted distribution.
- Forestry operations.
- Road maintenance activities, including clearing and herbicide use.
- Clearing and disturbance of native vegetation.
- Grazing and trampling by domestic stock.
- Grazing and trampling by feral herbivores.

- Phytophthora infection.
- Habitat infestation by tree of heaven, Leucanthemum vulgare and other invasive weeds.

Potential Impacts of the Activity

The Activity would result in the direct loss of up to 120 m^2 of good condition PCT 3521 - *Northwest White Box Woodland* in the road reserve, as potential habitat for the subject species. While no occurrence of the subject species were recorded in the site survey, these species are cryptic and often difficult to locate (particularly when not in flower). On a precautionary basis, the species have been assumed to be present at the site.

Large areas of alternative habitat of similar or better quality occurs adjacent to the site and the broader locality, that would not be directly impacted by the Activity. Habitat for these species in a local context would not be significantly affected by the works. The Activity would not significantly contribute to risk of competition by weeds with the implementation of safeguards such as '*Saving Our Species Hygiene Guidelines*', which would reduce the risk of weed material or plant pathogens introduced to the site.

It is considered unlikely that an adverse effect on the distribution of the subject species would occur such that a viable local population of either 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,

N/A.

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

The Activity would result in the direct loss of up to approximately 120 m^2 of good condition PCT 3521 in the road reserve, that is potential habitat for the subject species.

(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

Habitat at the sites is already fragmented from previous historic clearing of the road reserve. The Activity would result in a minor increase in the width of the cleared corridor of Nowendoc Road at the four sites. The Activity would not significantly affect the potential for cross-pollination to occur between individuals of the subject species. Considering the above, no significant fragmentation or isolation of habitat for the subject species is likely.

(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 habitat affected is in good condition and occurs within a previously disturbed road reserve. Austral Toadflax has not been recorded at the site and low numbers of BioNet records occur within the search area. While *Euphrasia arguta* has not been recorded at the site 81 records occur within the search area. The known habitat locally is significant for *Euphrasia arguta*. Given the minor area (120 m^2) of disturbance to potential habitat for the subject species, and the availability of similar or better-quality

habitat within the broader locality; the Activity is unlikely to significantly affect the long-term survival of the subject species within 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),

No areas of outstanding biodiversity value have been declared in Tamworth Regional LGA.

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 or ecological communities. The current list of KTP under the BC Act, and whether the Activity is recognised as a KTP is shown in **Table C1**.

Table C1 Key Threatening Processes

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process for threatened flora?*		
	Likely	*Possible*	*Unlikely*
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change			✓
Bushrock removal			✓
Clearing of native vegetation	✓		
Competition and grazing by the feral European Rabbit (*Oryctolagus cuniculus*)			✓
Competition and habitat degradation by feral goats (*Capra hircus*)			✓
Competition from feral honeybees (*Apis mellifera*)			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest eucalypt dieback associated with over-abundant psyllids and bell miners			✓
Habitat degradation and loss by Feral Horses, *Equus caballus*			✓
Herbivory and environmental degradation caused by feral deer			✓

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process for threatened flora?*		
	Likely	*Possible*	*Unlikely*
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition			✓
Importation of red imported fire ants (*Solenopsis invicta*)			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)			✓
Invasion and establishment of the Cane Toad (*Bufo marinus*)			✓
Invasion, establishment and spread of Lantana (*Lantana camara*)			✓
Invasion of native plant communities by African Olive (*Olea europaea L. subsp. cuspidata*)			✓
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of the Yellow Crazy Ant (*Anoplolepis gracilipes*) into NSW			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss of hollow-bearing trees		✓	
Loss or degradation (or both) of sites used for hill-topping by butterflies			✓
Predation and hybridisation by feral dogs (*Canis lupus familiaris*)			✓
Predation by the European Red Fox (*Vulpes vulpes*)			✓

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process for threatened flora?*		
	Likely	*Possible*	*Unlikely*
Predation by the feral cat (*Felis catus*)			✓
Predation by *Gambusia holbrooki* (Plague Minnow or Mosquito Fish)			✓
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)			✓
Removal of dead wood and dead trees			✓

Clearing of native vegetation is the only KTP likely to be contributed to by the Activity. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long-term modification, of the structure, composition and ecological function of stand or stands.

Considering the relatively small area of native vegetation to be removed, it is unlikely that the Activity would contribute significantly to this KTP.

The Activity is such that no other KTPs are considered likely to be substantially contributed to, especially with effective implementation of the mitigation measures in this report.

Overall, although the action proposed constitutes or is part of a key threatening process, the minor nature of the Activity is such that this contribution is very small and insignificant within the broader locality.

Conclusion

It is considered unlikely that the local population of Austral Toadflax or *Euphrasia arguta* would be placed at significant risk of extinction as a result of the Activity.

Assessment of Significance for Threatened Fauna

Fauna:

Birds

- Regent Honeyeater.
- Dusky Woodswallow.
- Painted Honeyeater.
- Swift Parrot.
- Powerful Owl.
- Scarlet Robin.
- Flame Robin.

Mammals

- Spotted-tailed Quoll.
- Eastern False Pipistrelle.
- Corben's Long-eared Bat.
- Greater Glider.
- Squirrel Glider.
- Koala.
- Greater Broad-nosed Bat.

To minimise repetition, the responses to the five-part tests are structured as follows:

Part (a), (c), (d) and (e) are answered per species or as a collective group of species depending on the nature of impacts.

Part (b) deals specifically with threatened ecological communities, and hence is not relevant to the subject threatened species assessment.

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,

Potential Direct Impacts from the Activity include:

- The trimming or removal of native trees and vegetation (120 m^2 of native vegetation).
- Direct mortality or injury to fauna during vegetation clearing.

Potential Indirect Impacts form the Activity on threatened species include:

- Fauna avoidance in proximity to the work area due to noise and human presence during construction and human presence during the construction phase of the project.
- Habitat degradation of adjacent habitat due to potential clearing phase impacts (e.g., erosion and sedimentation impacts or chemical spills).
- Unintentional introduction or spread or introduction of weeds.
- Unintentional introduction or spread of propagules or plant disease by way of plant and machinery.

For the purposes of this assessment the local population of threatened fauna species is defined as the population within the study area and within a two-kilometre radius of the site where vegetation is contiguous for all the subject species.

Vegetation to be removed is the same as the vegetation immediately adjacent to the site which would remain and continue to provide suitable habitat values at the site. The Activity represents a minor loss/ modification of potential habitat for:

Birds

- Regent Honeyeater – Foraging and nesting habitat.
- Dusky Woodswallow – Foraging and nesting habitat.
- Painted Honeyeater – Foraging and nesting habitat.
- Swift Parrot – Foraging habitat.
- Powerful Owl – Foraging and nesting habitat.
- Scarlet Robin – Foraging and nesting habitat.
- Flame Robin – Foraging and nesting habitat.

Mammals

- Spotted-tailed Quoll – Foraging habitat.
- Eastern False Pipistrelle – Foraging and non-breeding roost habitat.
- Corben's Long-eared Bat – Foraging and non-breeding roost habitat.
- Greater Glider – Foraging habitat.
- Squirrel Glider – Foraging and nesting habitat.
- Koala – Foraging habitat.
- Greater Broad-nosed Bat – Foraging and non-breeding roost habitat.

It is considered that the Activity would be unlikely to have an adverse effect on the life cycle of the listed threatened species such that a viable local population of the species would 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,

N/A.

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

The Activity would result in the direct loss/ modification of 120 m^2 of native vegetation within the existing road reserve. The local landscape is in good condition but has been historically cleared or modified for roads.

Threatened fauna habitat impacts are as follows:

The Activity represents a negative incremental, although relatively minor loss/modification of potential habitat for:

Birds

- Regent Honeyeater – Minor loss/ modification of foraging and nesting habitat.
- Dusky Woodswallow – Minor loss/ modification of foraging and nesting habitat.
- Painted Honeyeater – Minor loss/ modification of foraging and nesting habitat.
- Swift Parrot – Minor loss/ modification of foraging habitat.
- Powerful Owl – Minor loss/ modification of foraging and nesting habitat.
- Scarlet Robin – Minor loss/ modification of foraging and nesting habitat.
- Flame Robin – Minor loss/ modification of foraging and nesting habitat.

Mammals

- Spotted-tailed Quoll – Minor loss/ modification of foraging habitat.
- Eastern False Pipistrelle – Minor loss/ modification of foraging and non-breeding roost habitat.
- Corben's Long-eared Bat – Minor loss/ modification of foraging and non-breeding roost habitat.
- Greater Glider – Minor loss/ modification of foraging habitat.
- Squirrel Glider – Minor loss/ modification of foraging and nesting habitat.
- Koala – Minor loss/ modification of foraging habitat.
- Greater Broad-nosed Bat – Minor loss/ modification of foraging and non-breeding roost habitat.

While the habitat loss is negative, the Activity would impact <0.01% of native vegetation available to the local population of the subject species which is a minor amount. The Activity is unlikely to have any significant or long-term impacts on foraging habitat or breeding territory defended by the subject fauna species.

(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

The Activity would result in minor disturbance to native vegetation within the cleared corridor of the subject road. All the subject threatened species would have no difficulty in accessing habitats dissected by the road and therefore no area of habitat is likely to become substantially fragmented or isolated from other areas of habitat as a result of the Activity.

(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 habitats proposed for removal are in a high condition state with some disturbance present on the road verge due to previous roadworks and historic clearing. The removal of minor vegetation within the road reserve is of limited importance for the subject species, considering that alternative habitat of equivalent quality within the broader locality and would not be impacted by the Activity.

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),

No areas of outstanding biodiversity value have been declared in Tamworth Regional LGA.

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 or ecological communities. The current list of KTP under the BC Act, and whether the Activity is recognised as a KTP is shown in **Table C2**.

Table C2 Key Threatening Processes

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change			✓
Bushrock removal		✓	
Clearing of native vegetation	✓		
Competition and grazing by the feral European Rabbit (*Oryctolagus cuniculus*)			✓
Competition and habitat degradation by feral goats (*Capra hircus*)			✓
Competition from feral honeybees (*Apis mellifera*)			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest eucalypt dieback associated with over-abundant psyllids and bell miners			✓
Habitat degradation and loss by Feral Horses, *Equus caballus*			✓
Herbivory and environmental degradation caused by feral deer			✓
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition			✓
Importation of red imported fire ants (*Solenopsis invicta*)			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)			✓
Invasion and establishment of the Cane Toad (*Bufo marinus*)			✓
Invasion, establishment and spread of Lantana (*Lantana camara*)			✓

Key Threatening Process (as per Schedule 4 of the BC Act)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Invasion of native plant communities by African Olive (*Olea europaea L. subsp. cuspidata*)			✓
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of the Yellow Crazy Ant (*Anoplolepis gracilipes*) into NSW			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss of hollow-bearing trees		✓	
Loss or degradation (or both) of sites used for hill-topping by butterflies			✓
Predation and hybridisation by feral dogs (*Canis lupus familiaris*)			✓
Predation by the European Red Fox (*Vulpes vulpes*)			✓
Predation by the feral cat (*Felis catus*)			✓
Predation by *Gambusia holbrooki* (Plague Minnow or Mosquito Fish)			✓
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)			✓
Removal of dead wood and dead trees	✓		

Clearing of native vegetation and removal of dead wood and dead trees are the only KTPs likely to be contributed to by the Activity.

Considering the small area of native vegetation to be removed, it is unlikely that the Activity would contribute significantly to this KTP to the point of placing any local threatened species populations at risk of extinction.

Removal of dead wood and trees would be limited to the proposed works extent and constitute a minor impact. It is unlikely that the Activity would contribute significantly to this KTP to the point of placing any local threatened species populations at risk of extinction.

The Activity is such that no other KTPs are considered likely to be substantially contributed to, especially with effective implementation of the mitigation measures in this report.

Overall, the degree that the Activity would contribute to any threatening process is not considered likely to place the local population of any of the subject species at significant risk of extinction.

Conclusion

It is considered unlikely that the local population of any of the subject species would be significantly impacted by the Activity.

Appendix B

Preliminary Heritage Advice

RURAL::REGIONAL::REMOTE
Strathalbyn
669 Comara Road
RETREAT NSW 2355
NORTHERN TABLELANDS & BEYOND

16 March 2023

GeoLINK
Coffs Harbour

Attention: Michelle Campione_van Zetten

By email: mcampione-vanzetten@geolink.net.au

Dear Michelle

Re: Port Stephens Cutting upgrade works – Stage 1 - Preliminary Heritage Advice: four test pit locations.

As part of a comprehensive study and assessment of the heritage values and assessment of potential heritage impact by Tamworth Regional Council's major upgrade works along the Port Stephens Cutting, Eureka Heritage (Eureka) is pleased to provide Stage 1 preliminary heritage management advice for the excavation of four test pits.

The locations of the test pits, the subject of this preliminary advice, are shown in **Figure 1**. It is understood that the test pits would be located alongside the southbound lane (on the upward slope) and would be located in the embankment above the road surface. It is understood that the objective of the testing would be to assess the potential suitability and/or potential risks for excavation of the bank for road widening, and the suitability of the excavated material for re-use as pavement material during the upgrade works.

Historical Overview

In overview, the road known as the Port Stephens Line/Cutting originated in 1836 as a marked tree line from Port Stephens to Dungowan Creek, a tributary of the Peel River. The road provided a link between the Australian Agricultural Company's (AACo) Warrah and Goonoo Goonoo holdings, and their coastal holdings at Port Stephens. The AACo maintained the road and paid a small rent to the Government.

It is thought that in the 1850s, a less treacherous line of road was marked from Dungowan Creek to Nowendoc. However, it is not yet clear whether or not the section of road under study dates to the original line of the 1830s or the latter line of the 1850s. Records indicate that the AACo did have assigned convicts with stonemasonry skills, thus raising the potential for the dry-stone retaining walls to have been constructed in the 1830s.

A comparative heritage listed road, constructed in comparatively difficult terrain, can be found in the 1825-1836 convict built Great North Road, along which remain many dry-stone structures including retaining walls, bridges and culverts. Therefore, the potential for an historical association between the construction of the Port Stephens Cutting and convict built roadways requires further research for substantiation.

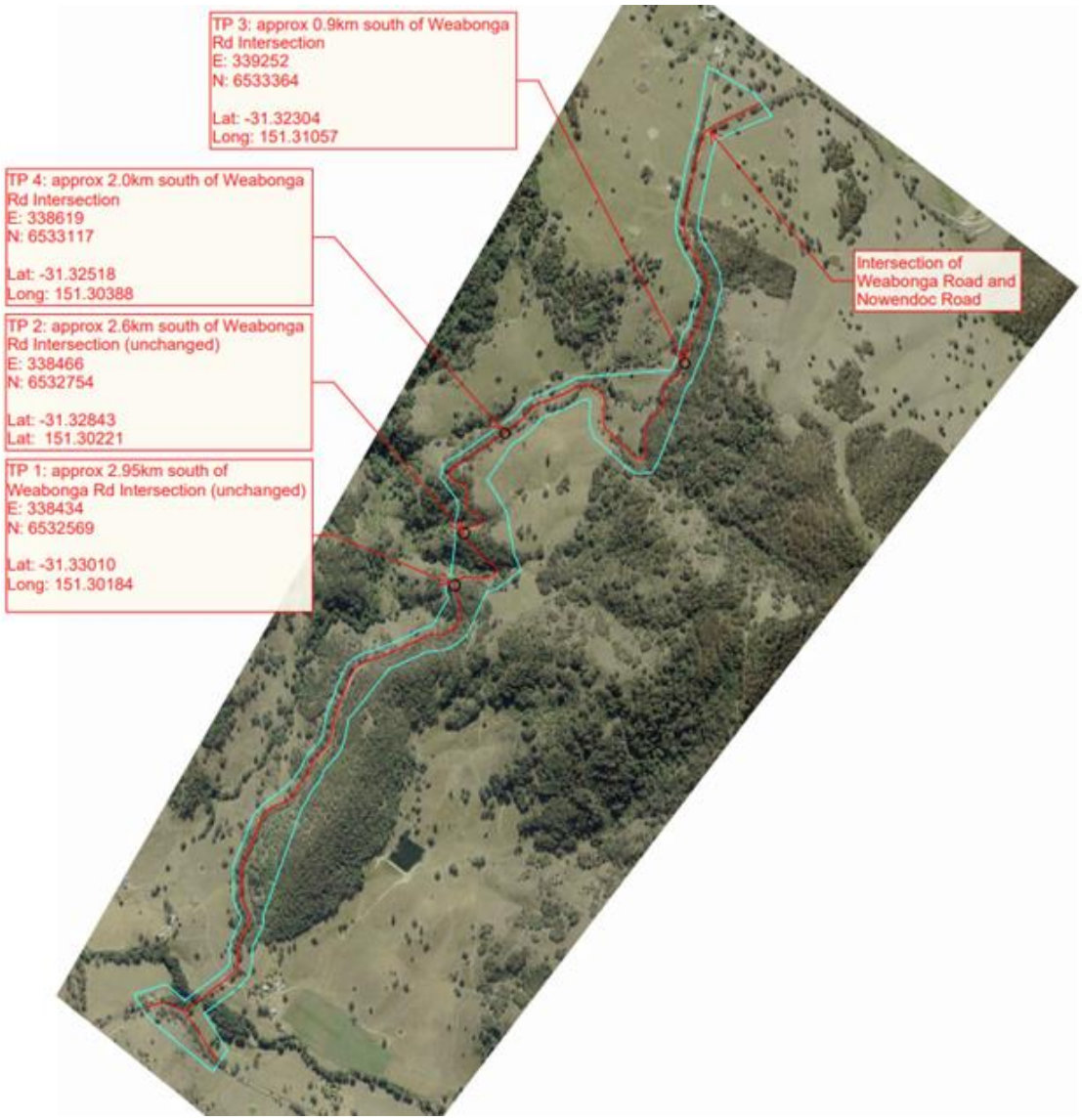


Figure 1 – Test Pit Locations along Port Stephens Cutting subject of this preliminary advice.

Site Inspection

Site survey was carried out by the Eureka team on Wednesday 1 February 2023. A summary of general observations made during the site inspection follows:

- The roadway has been 'cut' into the steep landform of the Dungowan Valley with most of the northbound lane (downward slope) supported by dry-stone walling. Some sections of walling consisted of two tiers (benches) of stonework.

  There appeared to be some gaps in the walling where the wall may have collapsed, been demolished or have become obscured with overburden/overgrowth. However, at this stage of the investigation, and as a precautionary measure, it is presumed that the dry-stone wall is continuous from the lower reaches of the roadway cutting to the higher reaches (approximately two kilometres) where the land form changes to a gentle slope to allow an earth embankment to support the road surface.

- Nine culvert outlets were observed within the stone walling supporting the roadway of the northbound lane, the majority of which appeared to have been piped with modern concrete inserts.

- Culvert inlets were difficult to locate along the southbound lane with many obscured with overgrowth or infilled with sediment and/or bitumen. One stone inlet on the southbound lane (upward slope) was identified approximately 100 metres to the north of the location of Test Pit 1 (**Figure 2**). These culverts drain beneath the road surface to the outlets located within the walling along the northbound or downslope road alignment.

Figure 2 – Example of obscured stonework of culvert inlet along the upward slope.

- There is some potential for structural remnants of the original stonework of the drainage culverts to remain beneath the road surface. Experience of similar sites indicates that this would take the form of a box culvert with smaller stones used to form the walls and floor, and larger capping stones used to form the roof of the culvert.

- Collapse of the upward slope bank alongside the southbound lane was observed in several locations (**Figure 3**). At most of these slump locations, the stone retaining wall supporting the northbound lane had been disturbed/covered with the landfall material, presumably when urgently cleared from the road surface. This obscured the upper courses of stonework but it was often observed that the stonework remained intact beneath (**Figure 4**).

Figure 3 – Evidence of bank collapse/slump on the upward slope in the vicinity of the location of Test Pit 1.

Figure 4 – Evidence of collapse material pushed over upper courses of stone wall at the same location as that shown in Figure 3.

Preliminary Assessment of Significance

Schedule 5 of the Tamworth LEP 2010 records the *Port Stephens Cutting, Hand Laid Stone,* as an item of local heritage significance. However, the inventory raises the potential for a level of State significance. Should historical association between the AACo and construction of the dry-stone retaining walls and culverts by their assigned convicts in the 1830s be clearly substantiated, this higher level of significance may be justified.

A comparative study of the dry-stone walls of the Great North Road, to be carried out as part of the full Statement of Heritage Impact, may provide additional insights and better clarity on the technological skills used in the construction of the dry-stone walls supporting the Port Stephens Cutting.

Legislative Considerations

The dry-stone walls supporting the Port Stephen Cutting are recognised as an item of environmental heritage with local heritage significance and are therefore protected under the NSW Heritage Act 1977 (The Act). Section 4 of the Act defines "environmental heritage" to mean those places, buildings, works, relics, moveable objects, and precincts, of historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value that are assessed as significant to the State or at the local level.

The Act does not further define a *work*, but dictionary definitions are adopted such that a *work* is taken to mean *'an engineering structure, such as a building, bridge, dock, etc'.* This definition would extend to cover road formations and *works* such as drains, bridges and culverts and structures that are considered road infrastructure such as the dry-stone retaining walls of the Port Stephens Cutting.

This definition is relevant to the current study as where a *work* might be impacted, there is no requirement for statutory permit application under the NSW Heritage Act 1977. However, the potential for the *relic's* provisions of the Act to be triggered should be carefully considered in the management approach. Heritage NSW is always concerned about the presence of *relics* that may occur in association with *works*, such as moveable artefacts or other structural remains, but ultimately a permit for works on and around structures considered *works* is not required.

In applying the definition of *work* not *relic* to this preliminary advice, the excavation for test pits at the prescribed locations does not require an application for a statutory permit under the Act. However, a due diligence approach should be taken for the management of any unexpected finds that might meet the definition of *work* or *relic*, and to avoid any inadvertent impact upon the dry-stone walls and associated drainage structures.

Assessment of Potential Impact by Test Pits

Test Pit 1 and Test Pit 4 are located within upper sections of the roadway supported by earth embankments are therefore do not pose a risk to dry-stone structures. Test Pit 2 and Test Pit 3 are located within lower sections of roadway that are supported by dry-stone walling and therefore a due diligence approach should be taken during excavation.

However, given the test pits would be excavated into the upward sloping bank of the southbound lane, there is a very low likelihood that excavation would result in any direct adverse impact upon the dry-stone retaining walls supporting the northbound lane adjacent to those sites.

Given the survival of the retaining walls for at least 170 years, despite the regular use of the road by heavy vehicles, and the repair and maintenance of the roadway by heavy machinery, the potential for indirect impact from vibration, and/or inadvertent impact by mechanical excavation, is also considered to be very unlikely. Nonetheless, a due diligence management approach is best practice in this instance and would provide clear guidance for any unexpected disturbance/discovery of works or relics.

Management Advice for Excavation of Test Pits

Given the limited disturbance required for the excavation of the four test pits and no known presence of works or relics on the southbound (upward slope) alignment of the Port Stephens Cutting (aside from the potential for remnant stonework of culvert inlets), there is no reasonable expectation for significant heritage or historical archaeological resources to be exposed by the test works. However, site personnel should be made aware that the discovery of a suspected work or relic needs to be managed appropriately.

The provisions of the NSW Heritage Act 1977 in relation to the exposure of a relic or work, or potential relic or work, require that those responsible for the discovery must notify nominated TRC management personnel who will in turn suspend work that might have the effect of disturbing, damaging, or destroying suspected works or relics. TRC should then seek the advice of the heritage specialist.

Work should be suspended:

i) if a relic or work is suspected, or there are reasonable grounds to suspect a relic or work is in ground, that might be disturbed damaged or destroyed by excavation; and/or

ii) if any relic or work is discovered in the course of excavation that will be disturbed, damaged or destroyed by further excavation.

It is recommended that personnel engaged in excavation of the test pits are made aware of the potential for the presence of dry-stone structures and culverts within proximity of the test pit sites, on both the northbound and southbound lanes.

Recommendations

The following recommendations are proposed for best practice heritage management during excavation of the test pits:

- Site personnel should be advised of the presence and significance of the dry-stone retaining walls along the roadway alignment. Some sections of stone wall may be obscured at the road level but still exist intact below.

- Excavated material should be removed from the site and not disposed through pushing over the edge of the roadway.

- Prior to commencement of excavation, the area should be inspected for any stonework of culvert inlets. In the event the stone work is found, if possible, move the test pit location by a few metres to avoid.

- Site personnel should take care to avoid damaging any remnant stone work along both the northbound and southbound lanes of the roadway.

- Site personnel should take a photographic record of the test pits.

- The heritage specialist should be engaged in an on-call capacity during excavation of the test pits in the event that advice for management of a suspected work or relic is required. It is usually possible to manage the discovery of a suspected work or relic by telephone, photographs and email. However, a site visit might be required in order to accurately make an assessment and formulate a management approach.

- Advice should be sought for any substantial change in the location of any test pit.

- If a work or relic is discovered/suspected during excavation, a process for site personnel to notify nominated Council personnel, and their contact details (with an alternative contact) should be established. The flow chart below provides guidance in this regard.

Conclusion

The likelihood of the discovery of works or relics at the sites of the four specified test pits is extremely low and is not reasonably expected. The recommendations and procedures outlined above are precautionary measures that demonstrate a due diligence, best practice approach in the event of the unexpected.

Please don't hesitate to contact Eureka should you require any clarification of any aspect of this preliminary advice, and/or require on-call advice during excavation.

Yours faithfully

Sue Singleton
HERITAGE CONSULTANT/ARCHAEOLOGIST

Revised 16 May 2023.

Appendix C

Native Title Search

National Native Title Tribunal

Application Details

Back to search results >

Gomeroi People (NC2011/006)

Application name	Gomeroi People
Tribunal file no.	NC2011/006
Federal Court file no.	NSD37/2019
Application type	Claimant
Date filed	20/12/2011
State or Territory	New South Wales
Area description	Northwest NSW
Approximate area size (sq km)	111317.6047
Local government area(s)	Coonamble Shire Council, Gilgandra Shire Council, Glen Innes Severn Shire Council, Gunnedah Shire Council, Gwydir Shire Council, Inverell Shire Council, Liverpool Plains Shire Council, Mid-Western Regional Council, Moree Plains Shire Council, Muswellbrook Shire Council, Narrabri Shire Council, Tamworth Regional Council, Upper Hunter Shire Council, Uralla Shire Council, Walcha Council, Walgett Shire Council, Warrumbungle Shire Council, Armidale Regional Council
Representative A/TSI body area(s)	New South Wales
Applicant's representative	NTSCORP
Registration decision status	Accepted for registration
Dates registered on the Register of Native Title Claims	Registered from 20/01/2012
Notification status	Notification Complete
Notification date(s)	16/05/2012 to 15/08/2012
Application status	Active **> More information on Federal Court website**

Schedule extract and attachments

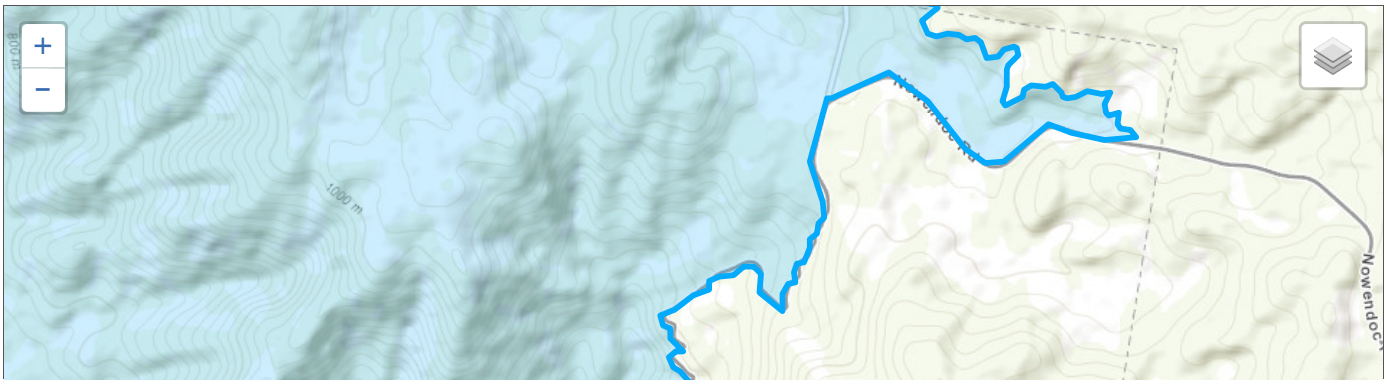
Schedule extract	**SNTAExtract_NC2011_006**
Schedule extract attachment/s	**NC2011_006 External boundary description** **NC2011_006 Map of the area covered by the application**

Registration Decision(s)

Tribunal file no.	Decision result	Decision type	Decision date	Reason for decision	Link to Register
NC2011/006-1	Accepted	Full Decision	20/01/2012	pdf rtf	**> Register Details**

Determination(s)

No determinations of native title have been made for this application



View this map in NTV:> **NC2011/006**

Appendix D

Aboriginal Cultural Heritage Assessment

Tim Hill (BA Hons.)
Heritage Management & Planning Pty Ltd
PO Box 502 BELLINGEN NSW 2454
timhill.heritage@gmail.com / 0473 033 615
ABN: 27 661 743 120

TH077- Port Stephen Cutting
6 February 2023

Tamworth Regional Council
c/o GeoLINK Consulting
Michelle Campione-van Zetten <mcampione-vanzetten@geolink.net.au>

Dear Michelle

Aboriginal Cultural Heritage (Due Diligence) Assessment
Port Stephen Cutting Safety Upgrades- Geotechnical Investigation

Further to the request for a Aboriginal cultural heritage assessment to support the Port Stephens Cutting Safety Upgrades, Ogunbil NSW, please see below statements in accordance with the reporting requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DEECW 2010).

The advice includes the following:

Appendix 1- maps of the proposed road safety works and geotechnical test pit areas

Appendix 2- a summary of the *Due Diligence Code of Practice for the protection of Aboriginal Objects in NSW* (DEECW 2010)

Appendix 3- results from the Aboriginal Heritage Information Management System (AHIMS) search

Appendix 4- a summary environmental assessment to identify landforms with heritage potential

Appendix 5- a summary of the Dungowan Dam Pipeline and Powerline archaeological assessment

Appendix 6- a summary of the site inspection with Uncle Don Fermor, and

Appendix 7- management and mitigation measures including a Unexpected Finds Procedure.

A site inspection was undertaken with Uncle Don Fermor from Tamworth Local Aboriginal Land Council on Friday 3 February which has confirmed that the proposed geotechnical test pits will not likely impact on Aboriginal cultural sites. Specifically, Don has advised that the cutting is located off the steep ridge and the rock, which he described as 'trap rock', is not of good quality and therefore is not suited to the production of stone tools. The outcome of the site inspection, in terms of Aboriginal cultural heritage, was that it was preferable to provide advice on the entire hill slope rather than just the identified geotechnical areas as Don considered it likely that Tamworth Regional Council would need to expand the search are to find good quality rock. The site inspection has concluded that these works can be undertaken using the 'Due Diligence' approval pathway, conditional on the implementation of a Unexpected Finds Procedure.

Sincerely

Tim Hill
Heritage Management & Planning Pty Ltd

APPENDIX 1- STUDY AREA MAPS

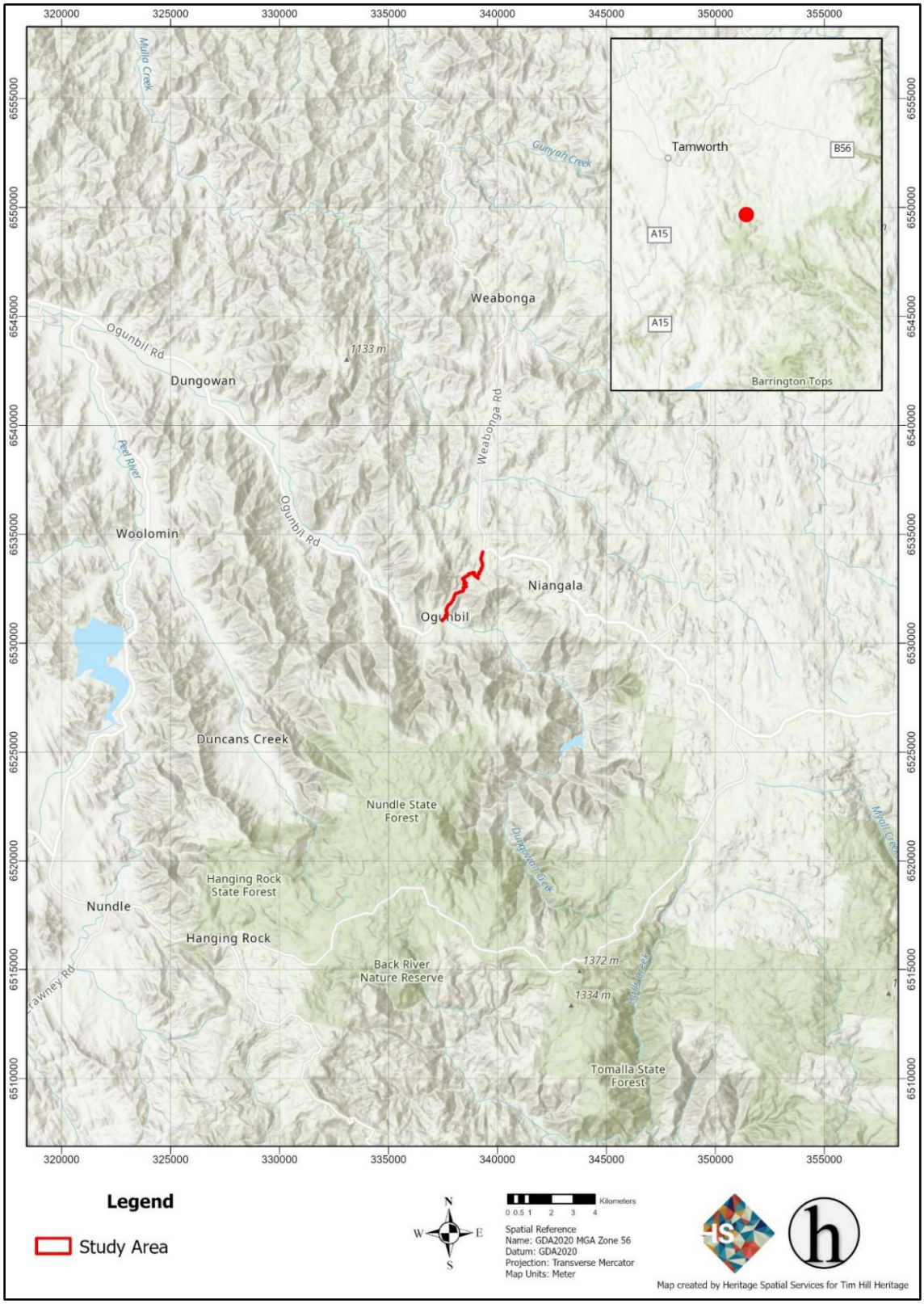


Figure 1: Location of the road safety upgrades at Port Stephens Cutting, Nowendoc Road Ogunbil

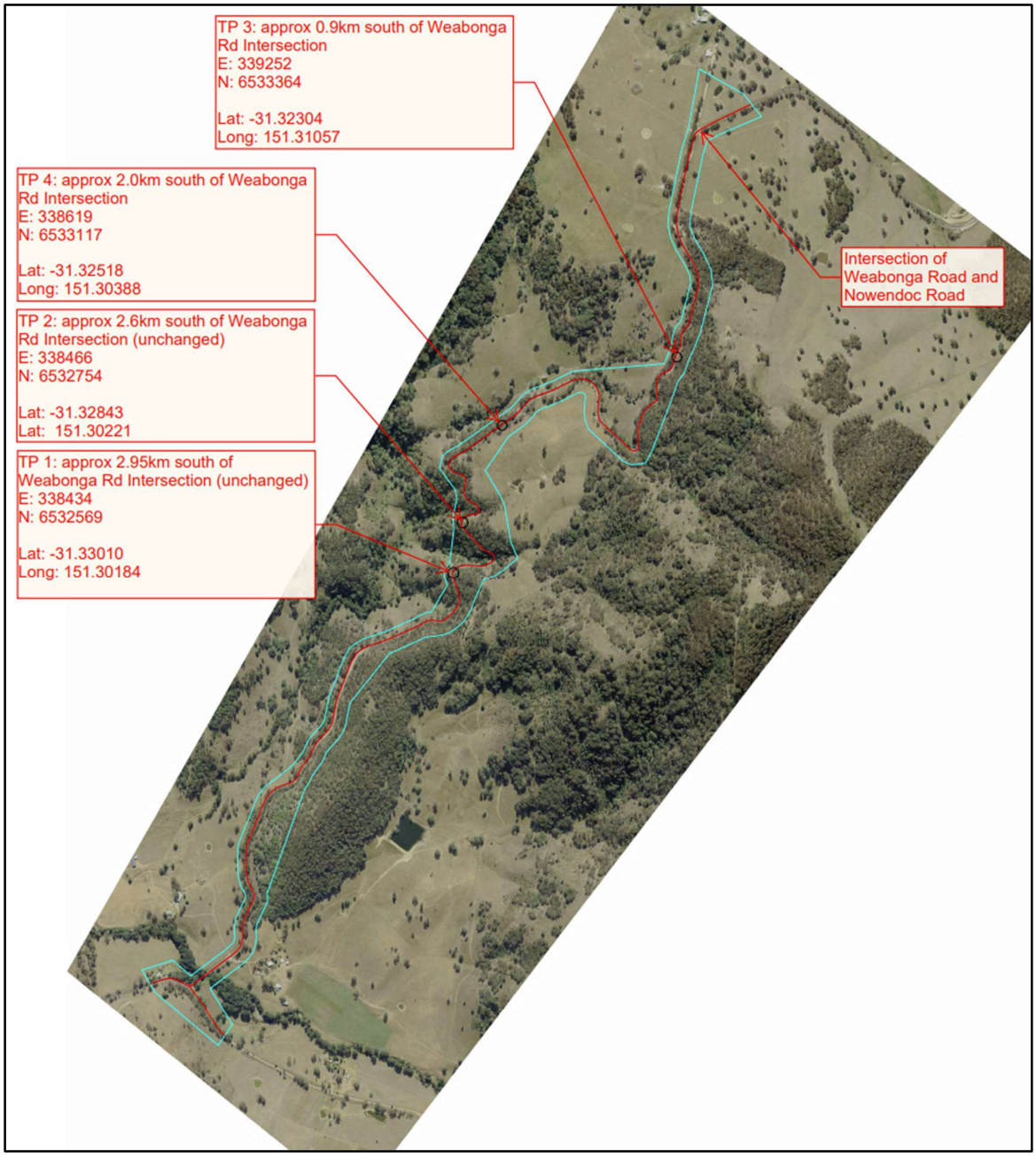


Figure 2: Location of geotechnical test pit locations

Figure 3: Geotechnical Test Pit 1 location

Figure 4: Geotechnical test pit 2 location

Figure 5: Geotechnical Test Pit 3

Figure 6: Geotechnical Test Pit 4 Location

APPENDIX 2- DUE DILIGENCE PRACTICE FOR THE PROTECTION OF ABORIGINAL OBJECTS IN NSW

The National Parks and Wildlife Act 1974 (NSW) (NPW Act) is the primary legislation concerning the identification and protection of Aboriginal cultural heritage in New South Wales. Three key definitions in the NPW Act which are relevant to this assessment include:

- Aboriginal object means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.
- Aboriginal remains means the body or the remains of the body of a deceased Aboriginal person, but does not include—

  (a) a body or the remains of a body buried in a cemetery in which non-Aboriginal persons are also buried, or

  (b) a body or the remains of a body dealt with or to be dealt with in accordance with a law of the State relating to medical treatment or the examination, for forensic or other purposes, of the bodies of deceased persons.
- harm an object or place includes any act or omission that—

  (a) destroys, defaces or damages the object or place, or

  (b) in relation to an object—moves the object from the land on which it had been situated, or

  (c) is specified by the regulations, or

  (d) causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c),

  but does not include any act or omission that—

  (e) desecrates the object or place, or

  (f) is trivial or negligible, or

  (g) is excluded from this definition by the regulations.

Section 86 of the NPW Act provides offense provisions for Aboriginal objects, Aboriginal skeletal remains and Aboriginal places in NSW (see the definition of 'Harm' above). Section 87 of the NPW Act outlines defences against prosecution relating to Aboriginal objects, skeletal remains and Aboriginal places. These include:

- Acting in accordance with an Aboriginal Heritage Impact Permit (AHIP) issued under Section 90 of the NPW Act

- Demonstrating that the "defendant exercised due diligence to determine whether the act or omission constituting the alleged offence would harm an Aboriginal object and reasonably determined that no Aboriginal object would be harmed"
- The activity was prescribed as a "low impact" activity or an "omission" under the NPW Regulations (2019), and
- Was undertaken in compliance with a Code of Practice adopted or prescribed by the NPW Regulations (2019).

The ACHA has been undertaken to determine whether the Proposed Works can be undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DEECW 2010A). The purpose of this Due Diligence Code of Practice is to establish a defence against prosecution in the event that Aboriginal objects may be inadvertently harmed during an activity (DEECW 2010A: 1 & 2). The Due Diligence Code of Practice:

> …sets out the reasonable and practicable steps which individuals and organisations need to take in order to:
>
> 1. identify whether or not Aboriginal objects are, or are likely to be, present in an area
> 2. determine whether or not their activities are likely to harm Aboriginal objects (if present)
> 3. determine whether an AHIP application is required (DEECW 2010A:2).

The Due Diligence Code of Practice makes the following statement on the requirement for an AHIP (DECCW 2010A:2):

> If Aboriginal objects are present or likely to be present and an activity will harm those objects, then an AHIP application will be required.

The practical application of the Due Diligence Code is that if the Due Diligence assessment concludes that harm to Aboriginal objects is "likely" to occur the proponent has an obligation to avoid the impacts by redesigning the activity or undertake additional archaeological investigation, including Aboriginal community consultation, in accordance with the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DEECW 2010 B) (CoPAI) (see below) to determine the requirement for an AHIP. A key limitation of the Due Diligence Code of Practice and the CoPAI is that they do not clearly define the thresholds of "likely" or "highly likely". To assist the assessment, the Merriam Webster dictionary definition of "likely" is:

> "Having a high probability of occurring or being true: very probable" (<https://www.merriam-webster.com/dictionary/likely>).

As such, where the Due Diligence assessment concludes that there might be a residual possibility that the activity might impact on Aboriginal objects *and* measures are put in place to avoid or reduce the likelihood of Harm then documentation of the assessment would provide a defense against prosecution for the activity and the project can proceed on the basis that the requirements have been met.

APPENDIX 3- ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM (AHIMS) SEARCH

A extensive search of the AHIMS database was undertaken on 13 January 2022 (see **Table 1**, **Figure 7**). The total number of sites identified by the AHIMS search was 103 (AHIMS #745083). Based on the summary of site types the most common type of archaeological sites are artefacts (n=77/ 53%) and artefacts with Potential Archaeological Deposits (n=22/21%). The next most common site type are carved and Scarred trees (n=23). The diversity of sites within the search area is considered to be representative of the New England Tablelands, which rarely contain middens, hearths of other types of organic rich sites directly associated with Aboriginal food consumption and production.

Table 1: AHIMS site type summary

Site type	Number	Frequency
Aboriginal Resource and Gathering	2	2
Art (Pigment or Engraved)	1	1
Artefact	53	51
Artefact, Habitation Structure	1	1
Artefact, Potential Archaeological Deposit (PAD)	22	21
Burial, Stone Arrangement	3	3
Ceremonial Ring (Stone or Earth)	1	1
Grinding Groove	1	1
Habitation Structure	2	2
Modified Tree (Carved or Scarred)	7	7
Potential Archaeological Deposit (PAD)	5	5
Stone Arrangement	3	3
Stone Arrangement, Modified Tree (Carved or Scarred)	1	1
Stone Quarry	1	1
	103	100

Based on a review of the AHIMS search the following previously recorded sites are located in close proximity to the Proposed Works (**Table 2**). These sites include scar trees identified during the Dungowan Dam study and include a potential scar tree at the intersection of Nowendoc Road and Weabonga Road.

Table 2: AHIMS previously recorded sites within close proximity to the Nowendoc Road

AHIMS ID	Site name	Easting	Northing	Site type
29-3-0119	DDST4	339323	6534215	Modified Tree (Carved or Scarred)
29-3-0108	DDST1	338287	6530577	Modified Tree (Carved or Scarred)
29-3-0122	DDST2	336190	6530595	Modified Tree (Carved or Scarred)

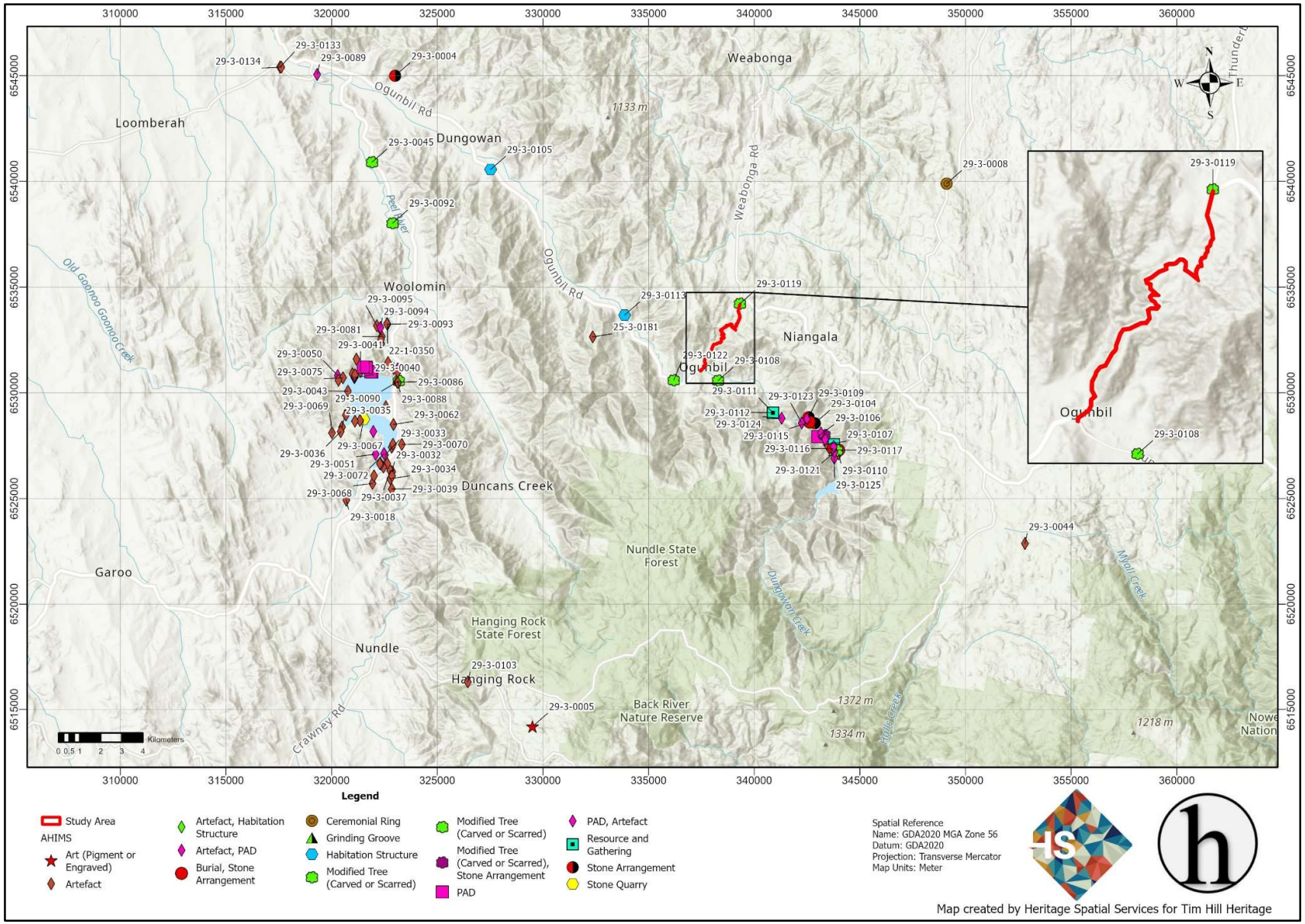


Figure 7:Map of AHIMS search results (AHIMS #745083)

h

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : TH077 Nowendoc road

Client Service ID : 745083

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
29-3-0004	The Dungowan Stones	AGD	56	322900	6544800	Open site	Valid	Stone Arrangement : -	Stone Arrangement	
Contact	Recorders	Harry Creamer						Permits		
29-3-0008	Niangla Bora Ground	AGD	56	349000	6539700	Open site	Valid	Ceremonial Ring (Stone or Earth) : -	Bora/Ceremonial	
Contact	Recorders	Ray Kelly						Permits		
29-3-0005	Hanging Rock;	AGD	56	329400	6514000	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
Contact	Recorders	Isabel McBryde						Permits		
25-3-0181	Chaffey Dungowan Pipeline Site Relocation 01	GDA	56	332356	6532644	Open site	Destroyed	Artefact : -		
Contact	Recorders	Everick Heritage Pty Ltd,Everick Heritage Pty Ltd,Mr.Tim Hill,Doctor.Alyce Camero						Permits	4820	
29-3-0094	Pipeclay Creek Open Campsite 02	GDA	56	322288	6533054	Open site	Partially Destroyed	Artefact : -		
Contact	Recorders	Everick Heritage Pty Ltd,Everick Heritage Pty Ltd,Mr.Tim Hill,Doctor.Alyce Camero						Permits	4820	
29-3-0095	Back Woolomin Road Site Relocation 01	GDA	56	322142	6533167	Open site	Destroyed	Artefact : -		
Contact	Recorders	Everick Heritage Pty Ltd,Everick Heritage Pty Ltd,Mr.Tim Hill,Doctor.Alyce Camero						Permits	4820	
29-3-0018	Nundle / Woolomin 1;	AGD	56	320590	6524730	Open site	Valid	Artefact : -	Isolated Find	3495
Contact	Recorders	Ms.Jill Ruig						Permits		
22-1-0350	LE-A1 & PAD 1	GDA	56	322644	6533249	Open site	Partially Destroyed	Artefact : 11, Potential Archaeological Deposit (PAD) : 1		101274
Contact	Recorders	Ms.Jacqueline Collins,Everick Heritage Pty Ltd,Mr.Matthew Finlayson						Permits		
29-3-0032	CDAS1	AGD	56	322761	6526075	Open site	Valid	Artefact : 6		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
29-3-0033	CDAS2	AGD	56	322417	6526865	Open site	Valid	Artefact : 4		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
29-3-0034	CDAS3	AGD	56	322673	6525742	Open site	Valid	Artefact : 4		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
29-3-0035	CDAS4	AGD	56	320388	6528187	Open site	Partially Destroyed	Artefact : 2		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Miss.Julia Maskell						Permits		
29-3-0036	CDAS5	AGD	56	320324	6527971	Open site	Valid	Artefact : 13		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
29-3-0037	CDIF1	AGD	56	322669	6526132	Open site	Valid	Artefact : 1		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
29-3-0038	CDIF2	AGD	56	322528	6526462	Open site	Valid	Artefact : 1		
Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd						Permits		
29-3-0039	CDIF3	AGD	56	322740	6525258	Open site	Valid	Artefact : 1		

Report generated by AHIMS Web Service on 13/01/2023 for Tim Hill for the following area at Lat, Long From : -31.5005, 151.0817 - Lat, Long To : -31.2073, 151.5761. Number of Aboriginal sites and Aboriginal objects found is 103

h

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : TH077 Nowendoc road

Client Service ID : 745083

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
29-3-0040	CDIF4	AGD	56	320975	6530524	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
29-3-0041	CDIF5	AGD	56	321262	6530813	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
29-3-0042	CDIF6	AGD	56	320878	6530707	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
29-3-0043	CDIF7	AGD	56	320666	6529883	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd					Permits		
29-3-0044	WEZ 6/A-Buttonderry Creek	GDA	56	352810	6522870	Open site	Valid	Artefact : 12		
	Contact	Recorders	Mr.Peter Kuskie					Permits		
29-3-0045	peel tsr 1	GDA	56	321912	6540905	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Malcolm Ridges					Permits		
29-3-0049	CDAS 6	GDA	56	321086	6530772	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Ms.Sam Harper					Permits		
29-3-0050	CDAS 7	GDA	56	320286	6530810	Open site	Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Ms.Sam Harper,Miss.Julia Maskell					Permits		
29-3-0051	CDAS 8	GDA	56	322082	6527095	Open site	Partially Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Ms.Sam Harper,Miss.Julia Maskell					Permits		
29-3-0052	CDAS 9	GDA	56	321086	6530772	Open site	Destroyed	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mr.Adrian Cressey,Miss.Julia Maskell					Permits		
29-3-0053	CDAS 10	GDA	56	322845	6527425	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mr.Adrian Cressey					Permits		
29-3-0054	CDAS 11	GDA	56	322565	6529338	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mr.Adrian Cressey					Permits		
29-3-0055	CDAS 12	GDA	56	322451	6526486	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mr.Adrian Cressey					Permits		
29-3-0056	CDIF 9	GDA	56	321105	6530851	Open site	Valid	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mr.Adrian Cressey					Permits		

Report generated by AHIMS Web Service on 13/01/2023 for Tim Hill for the following area at Lat, Long From : -31.5005, 151.0817 - Lat, Long To : -31.2073, 151.5761. Number of Aboriginal sites and Aboriginal objects found is 103

h

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : TH077 Nowendoc road

Client Service ID : 745083

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
29-3-0071	CHAFFEY A4	GDA	56	321341	6528687	Open site	Destroyed	Artefact : 1		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Ms.Sam Harper,Miss.Julia Maskell					Permits		
29-3-0072	CDAS13	GDA	56	322480	6527120	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Miss.Julia Maskell					Permits		
29-3-0073	CDT1	GDA	56	322281	6526654	Open site	Valid	Artefact : -		
	Contact	Recorders	Miss.Julia Maskell					Permits		
29-3-0074	CDT2	GDA	56	322006	6526074	Open site	Valid	Artefact : -		
	Contact	Recorders	Miss.Julia Maskell					Permits		
29-3-0075	CDT3	GDA	56	320535	6530706	Open site	Valid	Artefact : -		
	Contact	Recorders	Miss.Julia Maskell					Permits		
29-3-0076	CDT5	GDA	56	321102	6528655	Open site	Valid	Artefact : -		
	Contact	Recorders	Miss.Julia Maskell					Permits		
29-3-0077	CDAA	GDA	56	322860	6526070	Open site	Valid	Artefact : -		
	Contact	Recorders	Miss.Julia Maskell					Permits		
29-3-0078	Chaffey Dam Return Location	GDA	56	320322	6530594	Open site	Valid	Artefact : -		
	Contact	Recorders	Navin Officer Heritage Consultants Pty Ltd,Mrs.Nicola Hayes					Permits		
29-3-0093	Pipeclay Creek Open Campsite 01	GDA	56	322645	6533245	Open site	Partially Destroyed	Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Everick Heritage Pty Ltd,Mr.Tim Hill,Doctor.Alyce Camero					Permits	4820	
29-3-0080	Peel River AS2 with PAD	GDA	56	322339	6532509	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Virtus Heritage Pty Ltd - Pottsville					Permits		
29-3-0081	Peel River - AS3	GDA	56	322376	6532657	Open site	Valid	Artefact : 1		
	Contact	Recorders	Virtus Heritage Pty Ltd - Pottsville					Permits		
29-3-0082	Peel River IF4	GDA	56	322346	6532318	Open site	Valid	Artefact : 1		
	Contact	Recorders	Virtus Heritage Pty Ltd - Pottsville					Permits		
29-3-0083	Peel River IF5	GDA	56	322668	6531431	Open site	Valid	Artefact : 1		
	Contact	Recorders	Virtus Heritage Pty Ltd - Pottsville					Permits		
29-3-0084	Peel River - AS4	GDA	56	322621	6533262	Open site	Partially Destroyed	Artefact : 1		
	Contact	Recorders	Everick Heritage Pty Ltd,Virtus Heritage Pty Ltd - Pottsville,Doctor.Alyce Cameron					Permits	4820	
29-3-0085	Peel River AS5 with PAD	GDA	56	323128	6531126	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Virtus Heritage Pty Ltd - Pottsville					Permits		

Report generated by AHIMS Web Service on 13/01/2023 for Tim Hill for the following area at Lat, Long From : -31.5005, 151.0817 - Lat, Long To : -31.2073, 151.5761. Number of Aboriginal sites and Aboriginal objects found is 103

h

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : TH077 Nowendoc road

Client Service ID : 745083

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
29-3-0086	Peel River AS1 with PAD	GDA	56	323115	6530500	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Virtus Heritage Pty Ltd - Pottsville					Permits		
29-3-0087	Peel River PAD 2	GDA	56	322310	6533087	Open site	Partially Destroyed	Potential Archaeological Deposit (PAD) : 1, Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Virtus Heritage Pty Ltd - Pottsville,Doctor.Alyce Cameron					Permits	4820	
29-3-0088	Peel River IF2	GDA	56	323138	6530482	Open site	Valid	Artefact : 1		
	Contact	Recorders	Virtus Heritage Pty Ltd - Pottsville					Permits		
29-3-0089	Peel River IF3/Scarred Tree 3	GDA	56	319313	6545051	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton,Virtus Heritage Pty Ltd - Pottsville					Permits		
29-3-0090	Peel River Pot Scarred Tree 1	GDA	56	323173	6530561	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Mrs.Mary-Jean Sutton,Virtus Heritage Pty Ltd - Pottsville					Permits		
29-3-0092	Peel River Pot Scarred Tree 2	GDA	56	322886	6538018	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton,Mrs.Mary-Jean Sutton					Permits		
29-3-0096	Chaffey Dungowan IF5	GDA	56	322668	6531431	Open site	Valid	Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Mr.Matthew Finlayson					Permits		
29-3-0097	Chaffey Dungowan AS5	GDA	56	322945	6531142	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Mr.Matthew Finlayson					Permits		
29-3-0098	Chaffey Dungowan IF4	GDA	56	322346	6532317	Open site	Valid	Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Mr.Matthew Finlayson					Permits		
29-3-0099	Chaffey Dungowan AS2	GDA	56	322339	6532509	Open site	Valid	Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Mr.Matthew Finlayson					Permits		
29-3-0100	Chaffey Dungowan AS1	GDA	56	323098	6530510	Open site	Valid	Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Mr.Matthew Finlayson					Permits		
29-3-0101	Chaffey Dungowan IF2	GDA	56	323138	6530482	Open site	Valid	Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Mr.Matthew Finlayson					Permits		
29-3-0102	Chaffey Dungowan IF1	GDA	56	323128	6531000	Open site	Valid	Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Mr.Matthew Finlayson					Permits		
29-3-0103	Hills of Gold AFT 4	GDA	56	326445	6516299	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 13/01/2023 for Tim Hill for the following area at Lat, Long From : -31.5005, 151.0817 - Lat, Long To : -31.2073, 151.5761. Number of Aboriginal sites and Aboriginal objects found is 103

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : TH077 Nowendoc road

Client Service ID : 745083

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Matthew Kelleher,Kelleher Nightingale Consulting Pty Ltd (Generic users)					Permits		
29-3-0138	Chaffey - Dungowan Pipeline Artefact Relocation Area	GDA	56	321173	6531591	Open site	Valid	Artefact : -		
	Contact	Recorders	Everick Heritage Pty Ltd,Doctor.Alyce Cameron					Permits		
29-3-0133	DEW IF3	GDA	56	317557	6545401	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits	4899	
29-3-0134	DEW IF4	GDA	56	317616	6545398	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits	4899	
29-3-0104	DDSA1	GDA	56	342868	6528557	Open site	Valid	Stone Arrangement : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0105	DDPC1	GDA	56	327524	6540559	Open site	Valid	Habitation Structure : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0106	DDPAD1	GDA	56	343005	6527926	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits	4844	
29-3-0107	DDBAS1	GDA	56	343435	6527562	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits	4844	
29-3-0108	DDST1	GDA	56	338287	6530577	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0109	DDSA3	GDA	56	342570	6528842	Open site	Valid	Stone Arrangement : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0110	DDOS11	GDA	56	343993	6527108	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0111	DDCS5	GDA	56	340885	6529055	Open site	Valid	Artefact : -, Habitation Structure : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0112	DDCS4	GDA	56	340885	6529055	Open site	Valid	Aboriginal Resource and Gathering : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0113	DDCS3	GDA	56	333865	6533671	Open site	Valid	Habitation Structure : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0114	DDCS2	GDA	56	343769	6527559	Open site	Valid	Aboriginal Resource and Gathering : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		

Report generated by AHIMS Web Service on 13/01/2023 for Tim Hill for the following area at Lat, Long From : -31.5005, 151.0817 - Lat, Long To : -31.2073, 151.5761. Number of Aboriginal sites and Aboriginal objects found is 103

h

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : TH077 Nowendoc road

Client Service ID : 745083

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
29-3-0115	DDB1	GDA	56	342611	6528608	Open site	Valid	Burial : -, Stone Arrangement : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0116	DDB2	GDA	56	343736	6527348	Open site	Valid	Burial : -, Stone Arrangement : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0117	DDGG1	GDA	56	343792	6527300	Open site	Valid	Grinding Groove : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0118	DDB3	GDA	56	344001	6527281	Open site	Valid	Burial : -, Stone Arrangement : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0119	DDST4	GDA	56	339323	6534215	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0120	DDSA2	GDA	56	343321	6528002	Open site	Valid	Stone Arrangement : -, Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0121	DDST3	GDA	56	343911	6527275	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0122	DDST2	GDA	56	336190	6530595	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0123	DDFA B	GDA	56	342246	6528569	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0124	DDFA A	GDA	56	341299	6528795	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0125	DDFA H	GDA	56	343788	6526910	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		

Report generated by AHIMS Web Service on 13/01/2023 for Tim Hill for the following area at Lat, Long From : -31.5005, 151.0817 - Lat, Long To : -31.2073, 151.5761. Number of Aboriginal sites and Aboriginal objects found is 103

h

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : TH077 Nowendoc road

Client Service ID : 745083

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
29-3-0126	DDFA G	GDA	56	343801	6527209	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0127	DDFA F	GDA	56	343761	6527459	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0128	DDFA E	GDA	56	343357	6527786	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0129	DDFA D	GDA	56	343155	6528103	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		
29-3-0130	DDFA C	GDA	56	342499	6528764	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Ms.Georgia Burnett					Permits		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 13/01/2023 for Tim Hill for the following area at Lat, Long From : -31.5005, 151.0817 - Lat, Long To : -31.2073, 151.5761. Number of Aboriginal sites and Aboriginal objects found is 103

APPENDIX 4- ENVIRONMENTAL ASSESSMENT

The Peel River catchment covers an area of 4,669 km2 and flows from the western side of the Great Dividing Range east of Nundle to its confluence with the Namoi River east of Gunnedah (NSW Office of Water 2011:1) (Figure 8). The catchment ranges in elevation from 1300 metres above sea level on the eastern boundary to 288 metres above sea level at Carroll Gap. Ogunbil is located on Dungowan Creek at approximately 580 metres above sea level and the top of the Port Stephens Cutting is at approximately 950 metres above sea level.

The elevated ranges to the east and south are associated to igneous and metamorphic geological formations associated with the Great Dividing Range (Geoscience Australia). To the west of the catchment the geology is predominately sedimentary materials which pre-date the Great Dividing Range and more recent alluvial sediments. The igneous rocks are known to have been quarried for the production and trade of axes, with the Daruka Axe Quarry to the north of Tamworth being a regionally significant Aboriginal site. The granitic boulders and outcrops to the north and east of the Peel Catchment are known to contain a rock art sites and stone arrangements associated with ceremonial and 'Dreamtime" events. Additionally, the older sedimentary (mudstone/ siltstone) and metamorphic materials (Silcrete and quartzite) in the middle reaches of the Valley are suitable for the production of smaller stone tools which are common in New England archaeological assemblages.

The Peel River forms part of the Murray Darling Basin and is directly west of the Manning and Hunter River catchments. The upper catchment of the Peel River above Tamworth includes the major creek systems of the Dungowan Creek, Cockburn River and Goonoo Goonoo Creek. The complexity of these minor catchments is substantially related to the geological history of the catchment, with steeper and more complex creek systems coming out to of the Dungowan Creek catchment.

With respect to the likelihood that the Study Area will contain Aboriginal sites, the following landscape features are influential in the distribution of Aboriginal archaeological sites:

- The proximity of the river to small rocky outcrops and hills which provide campsites above the floodline
- The confluence of the creeks tributaries which have increase resource diversity, and
- The deposition of alluvial soils which create small swamps and anna branches which can remove or bury archaeological sites.

Dungowan Creek is mapped as the "Peel Channels and Floodplain" landscape (DECCW 2002:76 see Figure 9).

> … floodplain, swamps, lagoons and terrace remnants on Quaternary alluvium, general elevation 300 to 550m, local relief 20m. Downstream of Attunga the river is incised across the geological structure. River oak (*Casuarina cunninghamiana*) in higher sectors of the channel merging with river red gum (*Eucalyptus camaldulensis*) as the floodplain widens. Rough-barked apple (*Angophora floribunda*) and yellow box (*Eucalyptus melliodora*) on the floodplain.

The main range of the Port Stephens Cutting is mapped as part of the Niangala Plateau and Slopes (DECCW 2002:81-82)

> High rolling plateau on steeply dipping Devonian slate, phyllite, tuff, sandstone, conglomerate, chert and jasper, faulted Permian conglomerate, sandstone and mudstone, Carboniferous sandstone, slate and schist with small areas of Permian granite, general elevation 1050 to 1400m, local relief 100m. Substrate to the Tia Tops Landscape. Yellow and brown texture-contrast soils with deeper loam on alluvium. Woodland of snow gum (*Eucalyptus pauciflora*) and black sallee (*Eucalyptus stellulata*) on western ridges, with manna gum (*Eucalyptus viminalis*) and mountain gum (*Eucalyptus dalrympleana*) on midslopes and New England peppermint (*Eucalyptus cinerea*) in the valleys on cold sites. Open forest of; broad-leaved stringybark (*Eucalyptus caliginosa*), yellow box (*Eucalyptus melliodora*), narrow-leaved peppermint (Eucalyptus radiata), and narrow-leaved black peppermint (*Eucalyptus nicholii*) on better soils. Tall open forest of; New England blackbutt Page 82 (*Eucalyptus andrerwsii ssp. campanulata*), silver-top stringybark (*Eucalyptus laevopinea*), diehard stringybark (*Eucalyptus cameronii*), narrow-leaved peppermint, on moist margins of the plateau and grey box (*Eucalyptus molucanna*), yellow box (*Eucalyptus melliodora*), Youman's stringybark (*Eucalyptus youmanii*) on dry margins. Silvertop stringybark and lightwood (*Acacia implexa*) with white box (*Eucalyptus albens*) on northern slopes.

The impacts of previous ground disturbance is an important consideration in the Due Diligence assessment process, particularly where ground disturbance removes Aboriginal objects from the soil profile or disturbs the objects to a degree that the interpretation of the archaeological survey results is significantly compromised. The Due Diligence Code of Practice provides the following definition of 'disturbed lands'.

> Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable.
>
> Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks (DEECW 2010:18).

Archaeological sites are vulnerable to the following types of disturbance from road construction in the New England tablelands and upper western slopes:

Erosion- increases soil erosion where portions of sites have fallen into the river as the outside bends remove parts of the floodplain. Localised erosion has largely removed organics sites, such as hearths and middens, which are vulnerable to relocation by fast flowing water

Tree clearing- physical removes scarred and modified trees from the landscape either through forestry, ringbarking or as a result of bushfires and grass fires which burn older trees out

Accretion- the deposition of alluvial soils has the effect of burying stone artefacts, hearths and burials making them less visible during archaeological surveys, and

Civil works- results in the sideways movement of stone artefacts to the edge of the grading and topsoil removal with deposition of artefacts in winrows. While the sites typically stay in the general location the spatial integrity of the sites is substantially lost and topsoils are often mixed with rocky sub-soils and shales.

A review of a sample of historic aerial photos shows that Port Stephens Cutting was within the current alignment in the 1960's (**Figure 10**) and the surrounding agricultural landscape is substantially unchanged. The cutting was gravel at the time and has subsequently upgraded to bitumen. The 1880 Parish Maps (**Figure 11**) shows the alignment of the Port Stephens Cutting and as such it is reasonable to proceed with the assessment on the basis that the road reserve has been subject to repeated maintenance and management which would reduce the potential for Aboriginal sites or have resulted in the significant disturbance of Aboriginal sites.

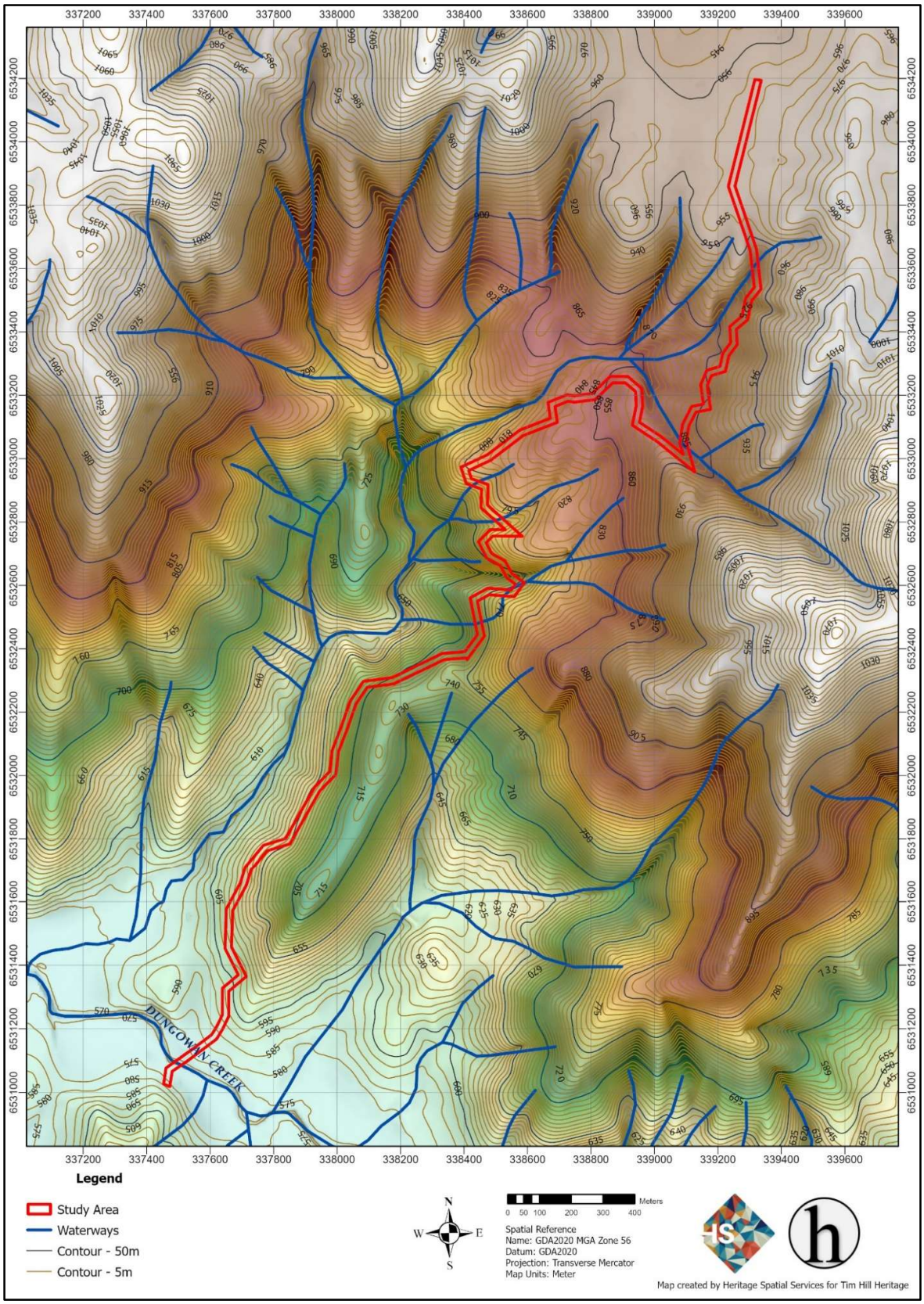


Figure 8: Topography and hydrology

Figure 9: Mitchell landscapes mapping

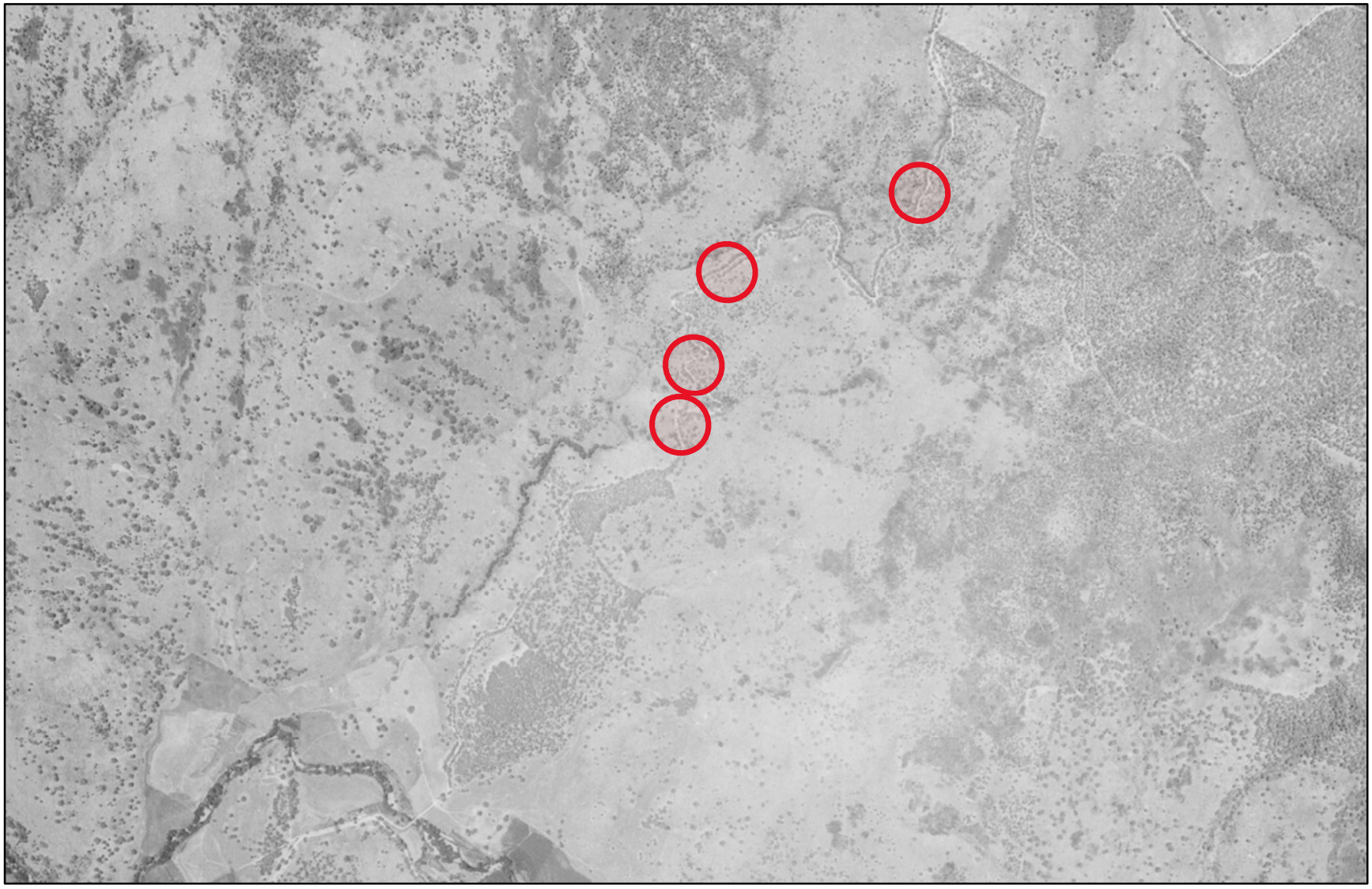


Figure 10: 1957 aerial image showing Port Stephens Cutting

h

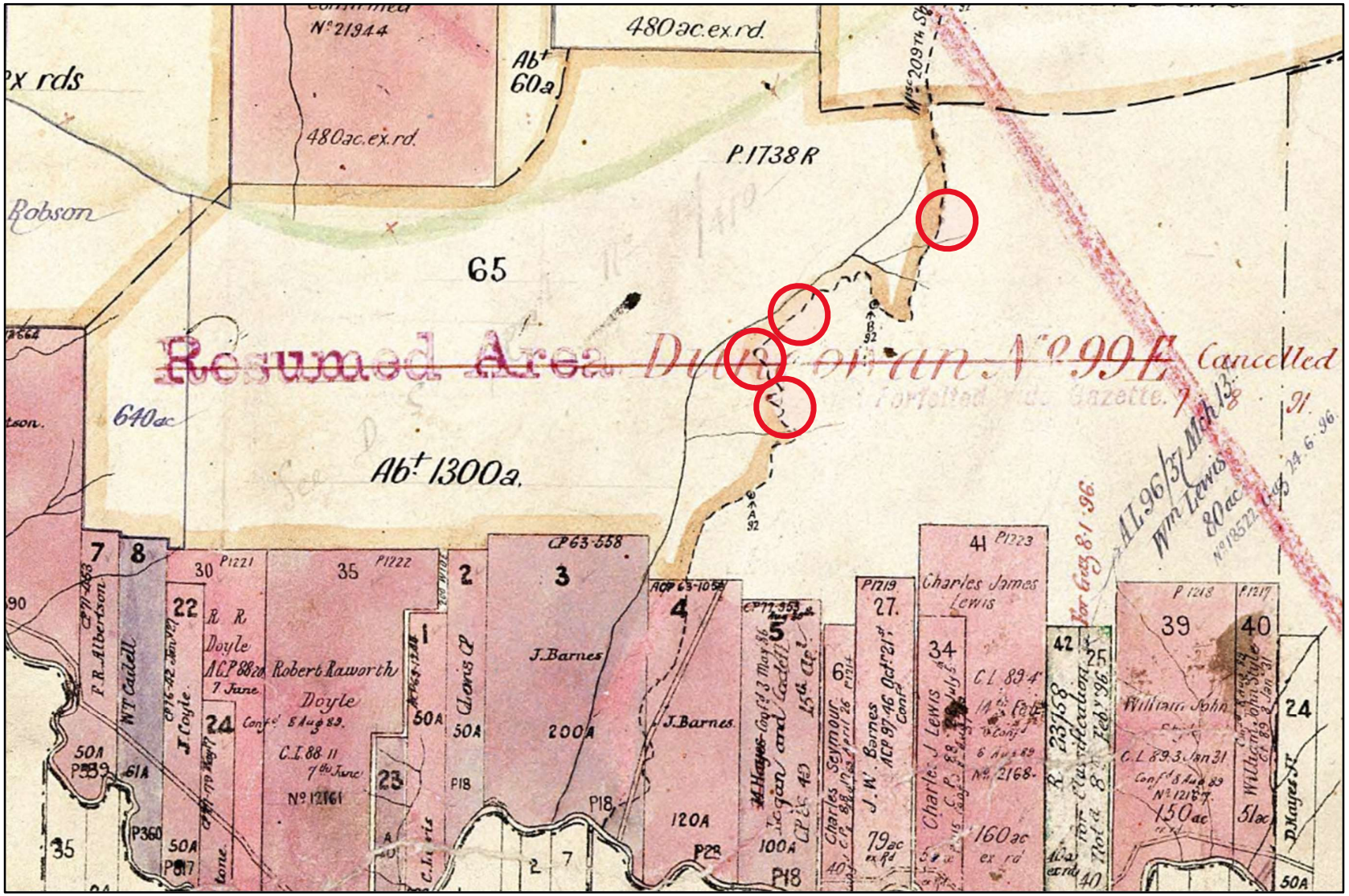


Figure 11: 1880 Ogunbil Parish Map showing Port Stephens Cutting

APPENDIX 5- THE DUNGOWAN DAM PIPELINE AND POWERLINE ARCHAEOLOGICAL ASSESSMENT

EMM Consultants (2021) undertook an ACHAR for the proposed upgrades to the Dungowan Dam which is located upstream from Ogunbil and included the pipeline and powerline easements in the vicinity of Ogunbil (pipeline) and Weabonga (powerline) (see **Figure 12** below). The study makes the following comment on the archaeological landscape of Dungowan Creek

> The field survey identified some 37 Aboriginal sites, places and/or objects across the project footprint... Eight of these sites had previously been documented as part of the cultural mapping, including several of the stone arrangements, culturally modified trees, and grinding groove. The remaining 29 sites were dominated by stone artefactual material of various densities, and included: 14 artefact scatters; 11 isolated artefacts. These sites were predominantly found on the alluvial terraces and lower slopes associated with Dungowan Creek; and have subsequently been integrated into the broader background scatter considered present across the project footprint... Of these, only one was specifically highlighted by the Aboriginal participants, consisting of an artefact scatter on a small crest adjacent to Terrible Billy Creek (DDOS11) – and which again reflected the importance of that creek corridor to the Aboriginal community. The remaining sites included three stone arrangements, and two potential culturally modified trees. The sites were similarly assessed for robustness, and either considered 'valid' or 'tentative' dependent on the archaeological features that were observed in the field. Ultimately, 24 of the 29 identified sites and objects were considered valid, with five labelled as tentative requiring further investigation. These latter sites were predominantly stone arrangements that in large part resembled the surrounding natural geology and/or rock picking associated with past agricultural activities; and culturally modified trees in which natural and/or post-European pastoral activities may have played a role in their creation. Both site types are recommended for further investigation to clarify their status. The potential grinding groove (DDGG1) was also considered tentative given they usually occur in sandstone geology that is not present in the project footprint, but has been listed as a cultural site by the Aboriginal participants.
>
> The archaeological test excavations were undertaken to explore the subsurface potential for cultural material. These focussed on alluvial terraces and lower slopes surrounding Dungowan Creek and its tributaries, many of which had been identified during the field survey through the presence of surface cultural material ... These excavations revealed that cultural material was primarily found within ~60 m of Dungowan Creek and associated tributaries, with significantly less cultural material found beyond this limit. This is substantially less than the 200 m buffer proposed from regional models. It is considered that this revised ~60 m buffer could also apply to nearby parts of Peel River given its similarity with the geomorphology of Dungowan Creek. The excavations recovered 1,662 stone artefacts, and demonstrated that a background scatter of ~10-15 artefacts/m2 could be

expected within the project footprint... This is a relatively high base-line value for the region, and may reflect the heavy exploitation of jasper (a raw material for stone tools) in the creek over the last 6 ka. Higher values of >30/m2, and up to 272/m2 in at least one location, are considered to reflect more intense and/or repeated use of a particular area or locale. Six of these foci were identified within the project footprint, and were generally small, <2,800 m2 (<60 x 60 m), but in some areas extended 350 m in length along the creek's edge. The cultural material was generally recovered from the upper 60 cm of the soil profile, with the highest densities between 10 cm and 50 cm below surface.

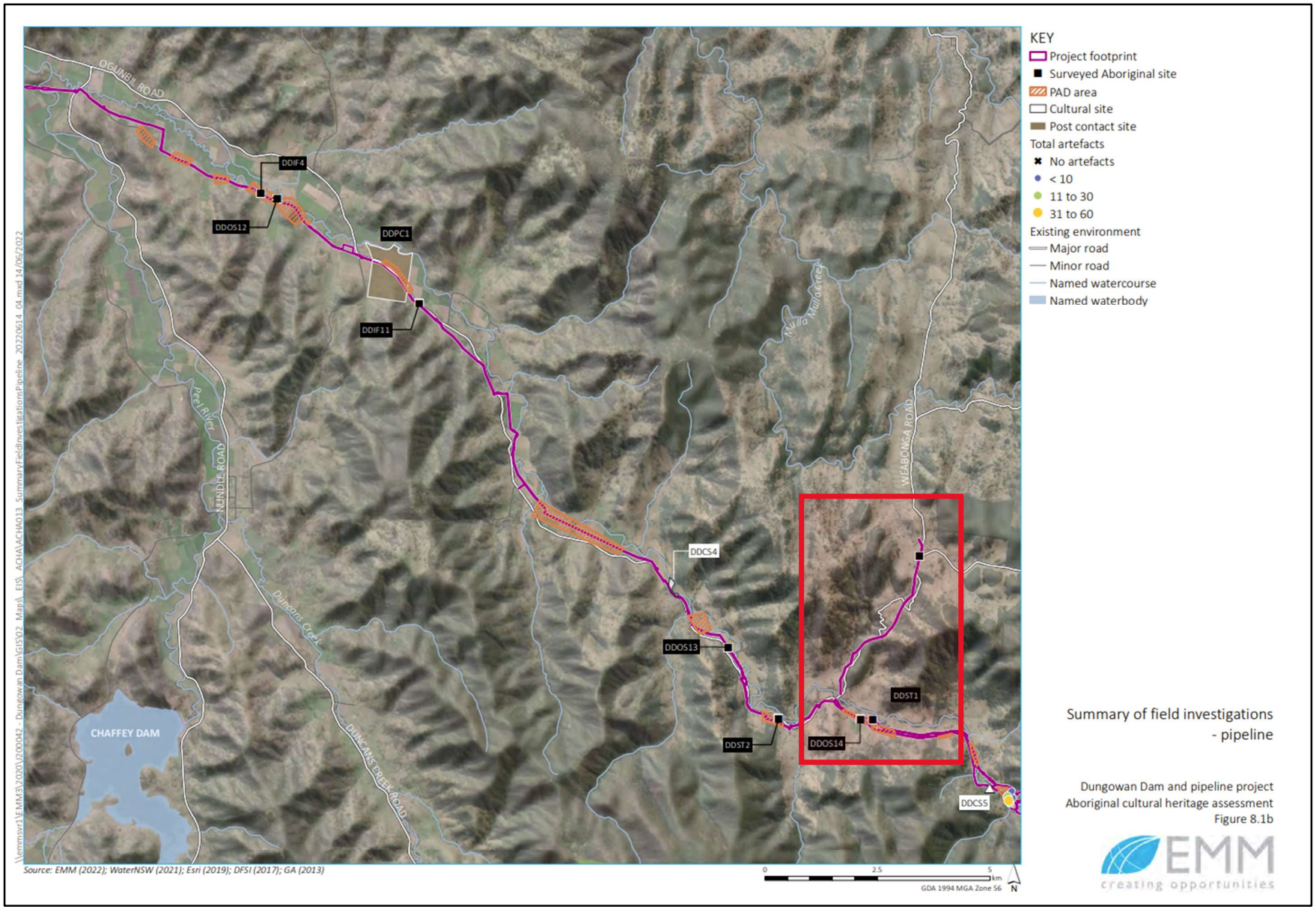


Figure 12: Outcomes of the Dungowan Dam and Pipeline assessment (EMM 2021)

APPENDIX 6- A SUMMARY OF THE SITE INSPECTION WITH UNCLE DON FERMOR

The archaeological site inspection was undertaken by Tim Hill and Uncle Don Fermor, Senior Aboriginal Sites Officers (Tamworth LALC) on 3 February 2023. The survey methodology included:

- Identification and discussion of the DDST4 scar tree (#29-2-0119)
- Identification and discussion of the proposed geotechnical test pit locations
- identification of potential spurs and crests on the cutting which had residual potential to contain sites associated with a pathway up the main spur, and
- consideration of the likelihood that the geotechnical survey areas would contain archaeological deposits.

Uncle Don was very familiar with the archaeological and cultural landscape of the Ogunbil area as he lived in the upper Peel River as a child and had worked on stations around Niangala. Uncle Dons family had come from Dungowan Creek and Niangala. His childhood included numerous trips into town with his father and stories of the surrounding area, including knowledge of the construction of the cutting by Convicts and the original road alignment at Weabonga. Uncle Don had also participated in the Dungowan Dam/ Creek studies and was present during the recording of the DDST4 site and the powerline up the main spur west of Port Stephens Cutting.

The following statements summarise the outcomes of the site inspection and Due Diligence assessment:

- No Aboriginal archaeological sites are known to occur on Port Stephens Cutting and based on the outcomes of the Dungowan Dam and Pipeline/ Powerline survey it is considered that there is a very low chance that Aboriginal sites will be located on the steep slopes or within the road reserve of the main cutting as it has been heavily disturbed from repeated road construction and maintenance
- The nature of the rock on Port Stephens Cutting, known to Uncle Don as 'traprock', is considered to be of very poor quality and it was considered that the stone was not suitable for tool production and would not have been a good place to camp as it supports a dry forest (**Figure 13** and **Figure 14**)
- Uncle Don considered it was better to provide advice on the entire cutting, rather than just the identified geotechnical test pit areas, as the rock was likely to be of poor quality and Tamworth Regional Council would need to chase good quality rock along the entire cutting
- the alluvial terraces along Dungowan Creek have the potential to contain insitu Aboriginal archaeological sites however it was noted that the elevated rises and knolls within the valley would be the preferred campsite locations above the floodmark with fishing and hunting grounds on the alluvial flats (**Figure 15** and **Figure 16**), and
- Uncle Don was familiar with the cutting and was not aware of any Aboriginal labourers on the road construction crew, however did note that his Uncles were stockmen and regularly used the Travelling Stock Route and cutting to move sheep and cattle between Stations.

Figure 13: Port Stephens Cutting showing significant cut and fill type construction that would have removed most topsoils

Figure 14: Typical cutting across a small spur/ crest showing low quality 'traprock' type shales

Figure 15: Example of small, elevated hills along the lower creek terraces (outside road reserve) identified as the best campsites in the valley

Figure 16: Alluvial terrace along Dungowan Creek which was identified as a potential campsite/ fishing place

APPENDIX 7- CONCLUSIONS AND RECOMMENDATIONS

The CoPAI (DEECW 2010B) requires that archaeological excavation should be undertaken under the following circumstances:

> "sub-surface Aboriginal objects with potential conservation value have a high probability of being present in an area, and the area cannot be substantially avoided by the proposed activity"

The requirement for additional archaeological investigation has been considered and it is concluded that additional archaeological excavation is not required for the geotechnical investigation areas as there is an overall low likelihood that Aboriginal sites will occur within the road reserve and adjacent steep rocky slopes. When applied across the upper Peel River, sites of conservation value would include those types of archaeological sites which are either rare or of deeper significance to the Aboriginal community, including burials, ceremonial sites such as stone arrangements and birthing places, rock art sites, scarred or carved trees and historic sites associated with Aboriginal reserves or "fringe" camps. Stone artefact scatters and isolated artefacts are relatively common and would not be considered candidates for conservation areas.

The survey has concluded that the geotechnical investigations, which form part of the Port Stephens Cutting safety upgrades, will not likely result in harm to Aboriginal heritage. As such the works can be undertaken using the Due Diligence approval pathway. However, it is recommended that a Aboriginal objects find procedure is put in place as a precautionary measure.

Recommendation 1: Aboriginal Objects Find Procedure

It is recommended that if it is suspected that Aboriginal objects have been uncovered as a result of construction within the Study Area:

a) work in the surrounding area is to stop immediately and records are made of the finds via project incident reporting procedures
b) a temporary fence is to be erected around the site and appropriate controls put in place to ensure that no additional ground disturbance happens in the vicinity of the find
c) an appropriately qualified archaeological consultant and a representative of the Tamworth LALC are to be engaged to identify the material and provide an initial assessment of the significance of the object and the likely nature and extent of any associated archaeological sites
d) if the material is found to be of Aboriginal origin, the find must be reported on the AHIMS database
e) In the event that the Aboriginal objects are considered to have been damaged or disturbed, the incident must be reported through the NSW Enviro Hotline, and
f) Works may only recommence after advice from Heritage NSW on the requirement for an AHIP or where design, engineer or construction measures are identified to mitigate further damage to the Aboriginal site.

Recommendation 2: Aboriginal Human Remains

Although it is unlikely that Human Remains will be located at any stage during earthworks within the Study Area, should this event arise it is recommended that all works must halt in the immediate area to prevent any further impacts to the remains. The site should be cordoned off and the remains themselves should be left untouched. The nearest police station (Tamworth), Tamworth LALC and the Heritage NSW (Parramatta) are all to be notified as soon as possible. If the remains are found to be of Aboriginal origin and the police do not wish to investigate the site for criminal activities, the Aboriginal community and the Heritage NSW should be consulted as to how the remains should be dealt with. Work may only resume after agreement is reached between all parties, provided it is in accordance with all parties' statutory obligations.

Appendix E

Soil Profile

NSW SOIL AND LAND INFORMATION SYSTEM

Soil Profile Report

SITE DETAILS

Site Location:	DUNGOWAN , NOWENDOC RD
Profile Details:	OBSCRALNE - NUNDLE Survey (1003613), Profile 15, collected from a batter by Mr Robert Banks on 03 May, 1998
Map Reference:	MGA Grid Reference: Zone 56, 339891E, 6534170N. 9135 NUNDLE (1:100000) map sheet.
Physiography:	footslope under dry sclerophyll forest and used for timber/scrub/unused. Slope 10.0% (measured), aspect north. Surface condition is hard set, profile is imperfectly drained, erosion hazard is slight, and no salting evident
Vegetation/Land Use:	limited clearing at the site, used for timber/scrub/unused, with improved pasture in the general area
Surface Condition:	hard set when described, ground cover is 100%
Erosion/Land Degradation:	slight; no salting evident
Soil Hydrology:	profile is imperfectly drained, no free water. Site is Exposed, run on is high and runoff is moderate
Soil Type:	Yellow Kandosol (ASC), Yellow Earth (GSG)
Base of observation:	bedrock reached
Profile Field Notes:	

SOIL DESCRIPTION

Layer 0		
0.00 - 0.00 m		
Layer 1	Horizon: A1	
0.00 - 0.24 m	Texture:	heavy clay loam
	Colour:	colour not recorded with no recorded mottles
	Structure:	massive (fabric is earthy)
	Soil fauna:	Activity is nil
	Cracks/Macropores:	Cracks are nil, macropores are nil
	Moisture/Consistence:	moderately moist,
	Field chemical tests:	Field pH is 6.0 (Raupach),
Layer 2	Horizon: B1	
0.24 - 0.65 m	Texture:	light clay
	Colour:	colour not recorded with no recorded mottles

	Structure:	massive (fabric is earthy)
	Soil fauna:	Activity is nil
	Cracks/Macropores:	Cracks are nil, macropores are nil
	Moisture/Consistence:	dry,
	Field chemical tests:	Field pH is 5.5 (Raupach),
Layer 3	Horizon: B2	
0.65 - 1.30 m	Texture:	light clay
	Colour:	colour not recorded with no recorded mottles
	Structure:	weak pedality (angular blocky, 5 - 10 mm, fabric is rough-faced peds)
	Soil fauna:	Activity is nil
	Cracks/Macropores:	Cracks are nil, macropores are nil
	Moisture/Consistence:	dry,
	Field chemical tests:	Field pH is 5.5 (Raupach),

LABORATORY TESTS

None available

For information on laboratory test data and units of measure, please see: Soil survey standard test methods

Report generated on 02/03/2023 at 03:59 PM

To contact us, email: soils@environment.nsw.gov.au

Appendix F

Contaminated Land Searches

Search results

Your search for:LGA: TAMWORTH REGIONAL COUNCIL

Matched 11 notices relating to 5 sites.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
DURI	13 Railway AVENUE	Duri Store	1 current
SOUTH TAMWORTH	251 - 253 Goonoo Goonoo ROAD	Coles Express Tamworth	4 current
TAMWORTH	115 Marius STREET	Elgas Depot (former gasworks)	2 current
TAMWORTH	49 GUNNEDAH ROAD	Gunnedah Road Site	2 former
WOOLOMIN	65 Nundle ROAD	Woolomin Gold Rush Store	2 former

Page 1 of 1

8 March 2023