NSW NATIONAL PARKS AND WILDLIFE SERVICE

Review of Environmental Factors: Tarlo River National Park Flume Replacement

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Document control

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1. Introduction

1.1 Brief description of the proposal

The project (Tarlo River National Park Flume Replacement) involves replacing a structurally failed concrete flume, worsened by dispersive soils due to recent drought and flood events. The proposed solution is to install a new rock flume, specifically designed to be compatible with the local shrink/swell soil conditions.

Additionally, the project includes expanding the current flume's footprint to accommodate the larger structure and upgrading a 4 km section of Long Swamp Road to improve construction access and facilitate the transportation of equipment.

Excess material from the construction will be utilised on site and on Long Swamp Road. The track upgrade will begin at the junction of Potters Trail and end at the junction of Bush Bottoms Trail.

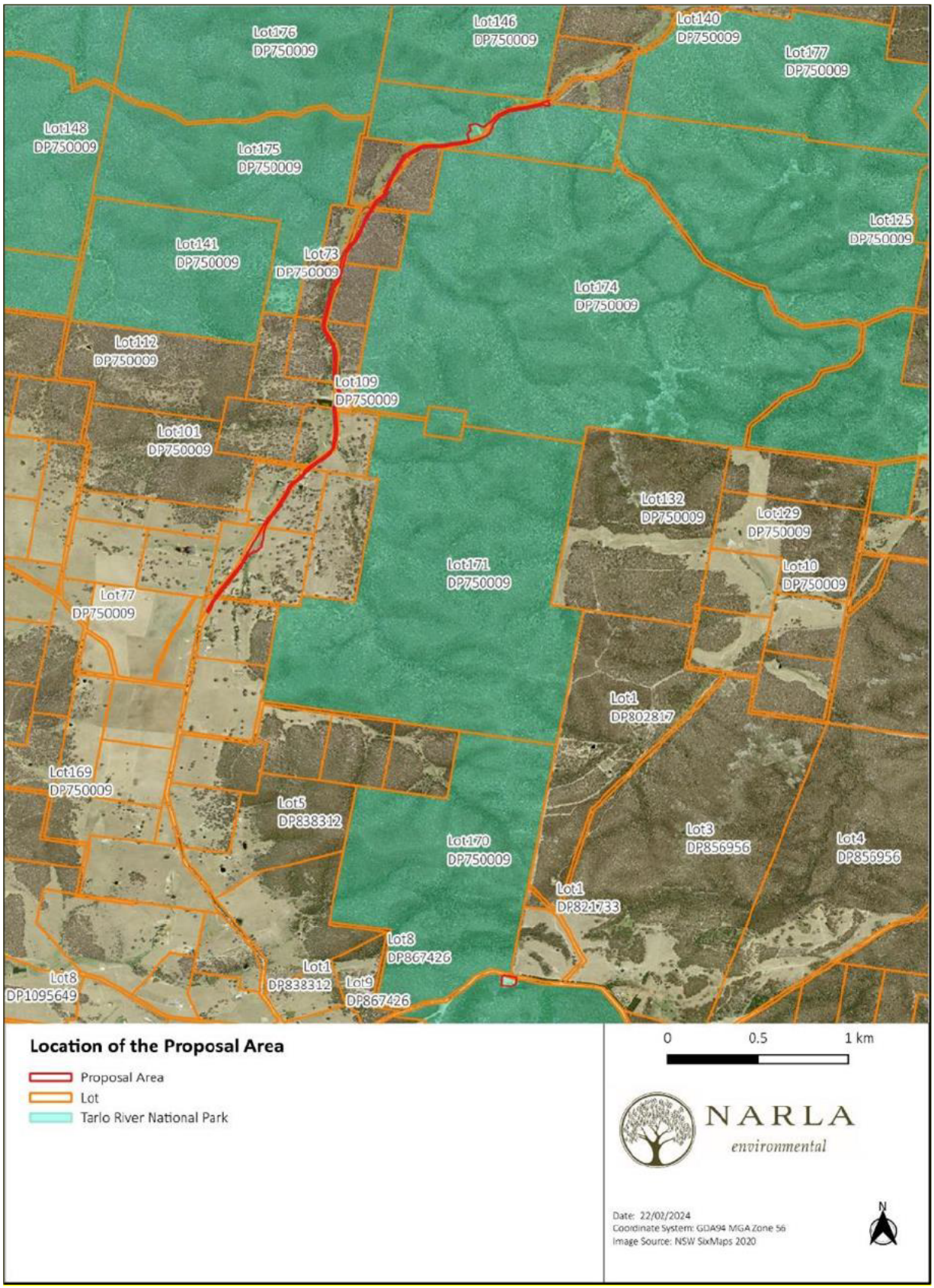
The project has a backup plan to use a decommissioned quarry on Towrang Road for the disposal of spoil material if it cannot be utilised on site.

1.2 Location of activity

The activity will occur in the locality of Greenwich Park, NSW, in the Upper Lachlan Local Government Area and the State electorate of Goulburn. The flume is located in Junction Creek. Road works are focused on Long Swamp Road. Additionally, a decommissioned quarry situated on Towrang Road will be used.

The flume, the northern extent of Long Swamp Road and the decommissioned quarry all fall within Tarlo River National Park, located in the NPWS Illawarra-Highlands Area. The remainder of Long Swamp Road is not within the jurisdiction of NPWS. The activity proposes works on this road across private land and on the public road reserve. Refer to:**, below and Appendix C for a more detailed view of the Proposal Area.**

Figure 1. Location of the activity.



1.3 Estimate development cost of project

Approximately $1.25 million.

1.4 Estimated duration of project

It is anticipated the project will take about 3 months to complete, with work scheduled to start in 2025 (weather permitting).

2. Proponent's details

Contact name	Andrew Wall
Position	Area Manager – Illawarra Highlands Area
Street address	84 Crown Street, Wollongong NSW 2500
Postal address	As above
Contact numbers	Team Leader Ranger – Adam Hook 0427 203 919 or Senior Field Supervisor – Will Bodor 0436 944 388
Email	Adam.Hook@environment.nsw.gov.au or William.bodor@environment.nsw.gov.au

3. Permissibility and assessment pathway

3.1 Permissibility under NSW legislation

The following sections outline how the activity is permissible under applicable NSW legislation.

3.1.1 National Parks and Wildlife Act 1974 (NPW Act)

On land reserved and acquired under the NPW Act

Objectives of the National Parks and Wildlife Act (s 2A)

The *National Parks and Wildlife Act 1974* (NPW Act) establishes the National Parks and Wildlife Service (NPWS), which is responsible for the control and management of all national parks in New South Wales. The main aim of the Act is to conserve the natural and cultural heritage of New South Wales. The objects of this Act (section [s] 2A.1) are as follows:

> a) the conservation of nature …
> b) the conservation of objects, places, or features (including biological diversity) of cultural value within the landscape …
> c) fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation
> d) providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation.

The proposed works have been assessed and follow the objectives of the Act. The proposed works will involve replacing the existing flume. If left untreated, the existing flume has the potential to degrade the neighbouring bushland, riparian areas, and landscape. Although the works will involve minor vegetation removal, the selective vegetation removal will result in long-term benefits for the surrounding area.

Reserve management principles – s.30E National Parks

The purpose of reserving land as a national park is to identify, protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor or tourist use and enjoyment so as to enable those areas to be managed in accordance with subsection (2).

> (2) A national park is to be managed in accordance with the following principles—
> a) the conservation of biodiversity, the maintenance of ecosystem function, the protection of geological and geomorphological features and natural phenomena and the maintenance of natural landscapes,
> b) the conservation of places, objects, features and landscapes of cultural value,
> c) the protection of the ecological integrity of one or more ecosystems for present and future generations,
> d) the promotion of public appreciation and understanding of the national park's natural and cultural values,
> e) provision for sustainable visitor or tourist use and enjoyment that is compatible with the conservation of the national park's natural and cultural values,
> f) provision for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to the conservation of the national park's natural and cultural values, …
> g) provision for appropriate research and monitoring.

Providing for the management of land reserved under this Act in accordance with the relevant management principles.

The proposed works have considered and comply with the management principles that apply to national parks. The proposed works will involve replacing the existing flume. If left untreated, the existing flume has the potential to degrade the neighbouring bushland, riparian areas, and landscape. Although the works will involve minor vegetation removal, the selective vegetation removal will result in long-term benefits for the surrounding area.

Tarlo River National Park Plan of Management (PoM)

The proposed works are consistent with the management directions outlined in Section 3.2 of the PoM which states:

> In addition to the above general objectives the management of Tarlo River National Park will be subject to the following more specific objectives:
>
> - maintenance of biodiversity;
> - protection of uncommon plant communities and species, particularly *Allocasuarina nana* heathland, *Eucalyptus cinerea* and Permian conglomerate communities;
> - maintenance of the habitat of threatened animal species;
> - protection and where necessary improvement of water quality in the Tarlo River and its tributaries; and
> - encouragement of community appreciation and understanding of the conservation values of the park and the need for responsible public use."

The proposed works will replace an existing flume. If left untreated, this flume could negatively impact the surrounding bushland and landscape, including Junction Creek, Tarlo River and its tributaries. Therefore, the proposal aligns with the PoM as it will help prevent any decline in biodiversity values and safeguard the water quality of riparian areas within the national park.

On lands not reserved or acquired under the NPW Act

NPWS has limited powers to carry out works on lands that have not been reserved or acquired under the NPW Act. Section 146(3) of the NPW Act, however, enables NPWS to enter into an agreement with nearby landholders to carry out works on their land (i.e. off park), to facilitate the management, maintenance or improvement of land reserved under the NPW Act. An agreement under s.146(3) has been entered into with the private landholders and Upper Lachlan Shire Council to cover the off-park components of the proposal.

Assets of intergenerational significance

N/A – there are no assets of intergenerational significance in proximity to the proposal.

Leasing, licensing, and easement provisions

N/A – the flume structure is not subject to any lease, licence or easement.

For internal NPWS projects only

Agreement has been obtained for the purposes of section 146 of the NPW Act with the neighbouring private landholder through which Long Swamp Rod passes and Upper Lachlan Shire Council who owns Long Swamp Road where works are required.

3.1.2 Wilderness Act 1987 (for activities in wilderness areas)

N/A

3.1.3 Biodiversity Conservation Act 2016 (BC Act)

The proposal is consistent with the purpose of the *Biodiversity Conservation Act 2016* (BC Act) which is "to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development."

One of the vegetation communities recorded in the Project Area is classified as PCT 3387 Central West Creekflat Grassy Woodland. This is associated with a Critically Endangered Ecological Community listed under the BC Act (see Section 8.2.5). A test of significance (**Appendix B**) has concluded that the Proposed Activity is not likely to cause a significant impact to any threatened ecological communities.

No threatened species or populations were found to be present within the Proposal Area at the time of the site assessment. A Likelihood of Occurrence Table for threatened flora and fauna species can be found in **Appendix A**.

Although minor native vegetation removal is necessary to facilitate the works, these impacts are limited to a few metres on either side of the existing track, as well as the footprint of the replacement flume.

Long Swamp Road where some works will take place, runs through a neighbouring property which is subject to a Conservation Agreement VC00382. The Conservation Agreement allows for maintenance to existing infrastructure such as roads. See DOC24/649367

3.1.4 NSW Reconstruction Authority Act 2022 (NSW RA Act)

The primary object of the NSW Reconstruction Authority Act 2022 is to promote community resilience to the impact of disasters in New South Wales through –

- Disaster prevention, preparedness and adaptation, and
- Recovery and reconstruction following disasters.

Section 38(1) of the NSW Reconstruction Authority Act 2022 (NSW RA Act) requires a public authority to have regard to the State Disaster Mitigation Plan in carrying out development under the Transport and Infrastructure State Environmental Planning Policy (SEPP).

The proposal is not contrary to the State Disaster Mitigation Plan. The purpose of the plan is to reduce the impact and cost of natural hazards on people, homes, livelihoods, infrastructure and communities. The proposal seeks to remediate the impact that the existing damaged flume is having on the surrounding environment by replacing it with a rock flume that prevents the existing head cut from moving upstream and continuing to lower the bed of Junction Creek.

3.1.5 Rural Fires Act 1997 (RF Act)

The proposal is consistent with the objectives of the Rural Fires Act 1997 which are to provide for:

> a) the prevention, mitigation, and suppression of bush and other fires in local government areas (or parts of areas) and other parts of the state constituted as rural fire districts
> b) the coordination of bush firefighting and bushfire prevention throughout the state c. the protection of persons from injury or death, and property from damage, arising from fires
> c) the protection of the environment by requiring certain activities referred to in paragraphs (a) – (c) to be carried out having regard to the principles of ecologically sustainable development described in section 2 (2) of the *Protection of the Environment Administration Act 1991*.

Under this Act, NPWS is a prescribed fire authority and is responsible for the control and suppression of all fires on lands that it manages. This management is subject to fire

management strategies prepared for national parks and other reserved lands. The upgrade of Long Swamp Road will assist in the future management of fires in Tarlo River National Park.

3.2 Environmental Planning and Assessment Act 1979

3.2.1 Assessment pathway

It is confirmed that a REF is the applicable assessment pathway because each of the following apply:

- The activity is not declared to be state significant infrastructure under s 2.13 of the Planning Systems SEPP.
- The flume replacement may be undertaken without development consent under the provisions of s 2.133 of the Transport and Infrastructure SEPP as it is for the purpose of soil conservation works.
- The road upgrade may be undertaken without development consent under the provisions of s 2.109 of the Transport and Infrastructure SEPP as it is by a public authority and for the purpose of a road.
- The activity is not identified as requiring development consent under another environmental planning instrument that prevails over the Transport and Infrastructure SEPP. In particular:
    - the activity is not in a coastal wetland or littoral rainforest, or it does not otherwise meet the criteria for development requiring consent outlined in s 2.7(2) of the Resilience and Hazards SEPP.
    - the activity is not coastal protection works.
    - the activity is not a type of development requiring development consent under s 2.9 of the Resources and Energy SEPP.
- The activity is not declared to be exempt development under an environmental planning instrument or fails to fully meet the requirements for exempt development.

3.2.2 Strategic plans

The relevant strategic plans made under Division 3.1 of the EP&A Act include:

Upper Lachlan Shire 2040 Local Strategic Planning Statement June 2020:

This proposal is consistent with the principles and priorities of this plan, including promoting a diverse agricultural economy, improving the diversity of land holding options to promote protection, production and investment, protecting and enhancing the indigenous, European, rural and natural landscapes and identifying and protecting high value agricultural land or land with high environmental value.

South East and Tablelands Regional Plan 2036:

The proposal is consistent with goal two of this plan, which is to create a diverse environment, interconnected by biodiversity corridors. There are several directions under goal two which the proposal is also consistent with, and these include: the protection of important environmental assets, the enhancement of biodiversity connection, increased resilience to natural hazards, the mitigation and adaptation to climate change and securing water resources.

3.3 Other relevant NSW legislation

3.3.1 Coal Mine Subsidence Compensation Act 2017

The Proposed Activity is not within the Coal Mine Subsidence District.

3.3.2 Fisheries Management Act 1994

The Proposed Activity will be occurring in “Key Fish Habitat” as part of the Hawkesbury-Nepean Basin. As such notification under the Fisheries Management is required.

3.3.3 Heritage Act 1977

The Proposal Area does not contain any items on the NSW State Heritage Register.

3.3.4 Marine Estate Management Act 2014

The Proposed Activity is not located near and will not affect a marine park or aquatic reserve.

3.3.5 Roads Act 1993

Under s.138 of the *Roads Act 1993*, no work may be carried out in or on a public road (including but not limited to digging up or disturbing the surface of a public road) without the consent of the relevant roads authority. Part of the project involves the upgrade of a section of Long Swamp Road that is a public road. The roads authority for this section of road is Upper Lachlan Shire Council.

Consent has been sought and obtained for the works on the road that form part of the proposal.

3.4 Commonwealth legislation

3.4.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) applies as the activity is on land that contains the following, or the activity may affect:

- nationally listed threatened species and ecological communities or listed migratory species.

An assessment consistent with the Significant Impact Guidelines 1.1 was undertaken for PCT 3387 which is associated with White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland which is listed as Critically Endangered under the EPBC Act. This found that the Proposed Activity is not likely to cause a significant impact to any nationally listed threatened ecological communities (**Appendix B**).

3.4.2 Native Title Act 1993

The Proposed Activity is not a ‘future act’ as per the *Native Title Act 1993* as all works are within the footprint of an existing public work.

3.5 Consistency with NPWS policy

Policy name	How proposal is consistent
Neighbour Relations Policy	This policy applies as Tarlo River National Park is accessed through privately owned land. The proposed activity will require access to the national park through Long Swamp Road, which traverses private properties. The proposal is consistent with NPWS's responsibilities for the good management and stewardship of the land and will be carried out with active communication with neighbours.
Vehicle Access Policy	This policy applies to the Proposed Activity, which involves vehicle access and track upgrades. In accordance with the policy, these upgrades will not cause unacceptable impacts on the environment and cultural heritage and have been designed with sensitivity to the landscape. The upgrades are appropriate and necessary to meet park management needs. Consent has been sought and obtained from the appropriate roads authority. Neighbouring landholders and other stakeholders who may be affected by the proposal have been consulted.
Soils and Water Policy	This policy provides relevant guidance on soils and water management issues, including river and catchment management, and water quality. The proposal is consistent with this policy given it incorporates mitigation measures to minimise impacts on water quality during construction and maintenance and disturbance to natural processes will be minimised.

3.6 Summary of licences and approvals

3.6.1 Approval under the National Parks and Wildlife Act

Internal NPWS approval or authorisation, including expenditure, is required. There are no existing approvals, such as permits, leases, licences, or easements, which apply to part or all of the proposed activity.

3.6.2 Other approvals

An Aboriginal Heritage Impact Permit (AHIP) will be required prior to the commencement of works (including vehicle access) due to the proximity of several recorded sites.

Approval is required from Upper Lachlan Shire Council and the neighbouring private landholder for work on Long Swamp Road.

3.6.3 Publication triggers

Triggers for publication of the Review of Environmental Factors

Permit or approval	Applicable?
Fisheries Management Act, sections 144, 200, 205 or 219	No. Notification is required under s.199 but no permit is required under s.205 as the proposal does not involve the blockage of fish passage.
Heritage Act, section 57	No
National Parks and Wildlife Act, section 90 (AHIP)	Yes
Protection of the Environment Operations Act 1997, sections 47–49 or 122	No

The REF must be published due to an AHIP being required.

4. Consultation – general

4.1 Statutory consultation

4.1.1 Consultation under the Transport and Infrastructure SEPP

The Transport and Infrastructure SEPP requires consultation with relevant authorities as identified in the following table.

Consultation triggers under the Transport and Infrastructure SEPP

Authority (TISEPP section)	Trigger	Applicable to proposal?
Consultation with local council (s 2.10)	Development with impacts on council infrastructure or services (such as stormwater, sewer, water, roads, and footpaths)	Yes
Consultation with local council (s 2.11)	Development with impacts on heritage items listed under the local environmental plan (LEP)	Yes
Consultation with local council (s 2.12)	Development that will change flood patterns on flood-liable land	No
Consultation with State Emergency Service (s 2.13)	Development on flood-liable land	No
Consultation with local council (s 2.14)	Development that is inconsistent with a certified coastal management program affecting land within the mapped coastal vulnerability area.	No
Consultation with NPWS (s 2.15(2)(a))	Development adjacent to land reserved or acquired under the NPW Act	Yes
Consultation with NPWS (s 2.15(2)(b))	Development on land in Zone C1 that is yet to be reserved under the NPW Act	No
Consultation with Transport for NSW (s 2.15(2)(c))	Development comprising a fixed or floating structure in or over navigable waters	No
Consultation with the Director of the Siding Spring Observatory (s 2.15(2)(d))	Development that may increase the amount of artificial light in the night sky and that is on land within the mapped dark sky region	No
Consultation with the Cwth Department of Defence (s 2.15(2)(e))	Development located within the buffer around the defence communications facility near Morundah as mapped under the Lockhart, Narrandera, or Urana LEPs	No
Consultation with the Subsidence Advisory NSW (s 2.15(2)(f))	Development on land in a mine subsidence district.	No
Consultation with the Willandra Lakes Region World Heritage Advisory Committee and Heritage NSW (s 2.15(2)(g))	Development on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region World Heritage Property	No

Authority (TISEPP section)	Trigger	Applicable to proposal?
Consultation with the Western Parkland City Authority (s 2.15(2)(h))	Development within a Western City operational area (Western Parkland City Authority Act 2018, Schedule 2) with a capital investment value of $30 million or more	No
Consultation with Transport for NSW (s 2.221)	Traffic-generating development listed in Schedule 3	No

Details of required consultation

- NPWS is the proponent. Consultation with NPWS is not required because the works are being proposed by NPWS.
- The Proposed Activity requires consultation with local council (s 2.11) as there will be impacts on heritage items listed under the Local Environmental Plan (LEP). Tarlo River National Park is listed under the Upper Lachlan Shire LEP as a Heritage Item (Listing Type: LEP #I160). NPWS has consulted Upper Lachlan Shire Council via email and they have no objections to the work. Upper Lachlan Shire council was emailed on the 27th of December 2024 and were asked for comment. The Manager of Planning and Regulatory Services and a Senior Town Planner replied on the 22nd of January 2025 and 5th of February 2025. See DOC25/30983.
- Consultation with local council (s 2.10) is required given Long Swamp Road is a council road. Council has signed an agreement with the NPWS Area Manager, giving permission for the works to take place. See DOC24/775210.

4.1.2 Consultation under the Fisheries Management Act

NPWS emailed Fisheries regarding the proposed works on the 5th of December 2024 and received a response from the Fisheries Manager for the Murray Darling on the 13th of December 2024. See DOC24/1067078. Fisheries has no objections provided environmental safeguards for sediment and nutrient control and waste stockpiling are met.

4.2 Targeted consultation

4.2.1 Adjacent landowners

NPWS has signed an agreement with the landholder who owns land adjacent to Long Swamp Rd, south of the flume site where work will be required. They have no objections to the work. See DOC24/755352.

NPWS has also consulted with the landholder to the north of the site who uses Long Swamp Road for access. They have no objections to the work.

4.2.2 Wider community consultation and/or notification of works

No further community or stakeholder consultation has occurred. Notification of works will be posted on the NPWS website as an alert for Tarlo River National Park.

5. Consultation – Aboriginal communities

NPWS identified two Aboriginal stakeholders for the Project Area: Pejar Local Aboriginal Land Council and the Gundungurra People, who hold an Indigenous Land Use Agreement (ILUA) for Tarlo River National Park.

The Gundungurra ILUA only applies to that part of the proposal in Tarlo River National Park and not to the component on private land or the road reserve. The ILUA specifies when notification is required as per the following extracts from the Gundungurra ILUA:

> 14.2: The Parties agree that in the event that a proposed act affects land outside the Agreement Area as well as land within the Agreement Area, for the purposes of this clause the act shall be treated as only affecting land outside the Agreement Area and as such the Alternative Regime shall not apply.
>
> 14.19: The Parties consent to the undertaking of Class 3 Post Registration Acts and the Applicants, the Gundungurra Corporation and the Gundungurra Association agree they shall have no procedural rights in relation to the undertaking of the Class 3 Post Registration Acts. The Parties agree that the Non Extinguishment Principle applies to Class 3 Post Registration Acts.
>
> In the ILUA, Clause 14.18 lists the following activities which align with the planned project as Class 3 Post Registration Acts:
>
> 14.18: The Parties agree that the following classes of Post Registration Acts lawfully undertaken … in the Agreement Area comprise Class 3 Post Registration Acts: …
>
> J) maintenance, operation and repair of Public Works
>
> L) replacement of existing Public Works with similar or upgraded works within the same area of the existing Public Works or with minor realignment.

Thus, under clause 14.19, the activity may proceed under the terms of the ILUA.

Both Pejar LALC, represented by CEO Delise Freeman, and the Gundungurra People, represented by Aunty Sharon Halls, were contacted, and invited to attend a due diligence survey. However, Aunty Sharon Halls informed that no one was available for the survey. Nevertheless, Chris McAlister attended the survey as the Pejar LALC representative.

An Aboriginal Cultural Heritage Assessment Report (ACHAR) has been drafted after required consultation with Registered Aboriginal Parties (RAPS). Both the Gundungurra People and Pejar LALC have been represented during the ACHAR process. An Aboriginal Heritage Impact Permit (AHIP) will be required prior to the commencement of works for sites discovered during the survey on private land and Long Swamp Road, adjacent to Tarlo River National Park (**Figure 5**).

6. Proposed activity

6.1 Location of activity

6.1.1 Description of location

The majority of the proposal will involve works in Tarlo River National Park. This includes the replacement of the flume, roadworks on the northern part of Long Swamp Road and use of the decommissioned quarry on Towrang Road.

Part of the proposal involves roadworks on Long Swamp Road, a public road that, in part, traverses private land (323 Long Swamp Road, Greenwich). See **Figure 1**.

The project intersects multiple lots as follows:

Lot and DP	Tenure
Lot 103/DP750009	Tarlo River NP
Lot 109/DP750009	private
Lot 146/DP750009	Tarlo River NP
Lot 168/DP750009	Tarlo River NP
Lot 29/DP750009	private
Lot 72/DP750009	private
Lot 73/DP750009	private
Lot 74/DP750009	private
Lot 75/DP 750009	private
Lot 78/DP750009	private
Lot 80/DP750009	private

6.1.2 Grid references

Start of proposed works area on Long Swamp Road:

- Easting: 217553, Northing: 6171550 (GDA94 MG56)

Existing flume:

- Easting: 218952, Northing: 6174804 (GDA94 MG56)

Decommissioned quarry:

- Easting: 219281, Northing: 6169136 (GDA94 MG56)

6.2 Description of the Proposed Activity

6.2.1 Overview

The Proposed Activity will involve the following works:

- The replacement of an existing concrete flume, which has experienced structural failure attributed to dispersive soils aggravated by recent drought and flood events, with a new flume constructed from rock, chosen for its compatibility with the local shrink/swell soil type and with the following characteristics:
  - an estimated discharge capacity of the proposed solution of 69 m^3/sec during a 1:100 (1%) rainfall event.
  - a larger footprint than the existing flume
  - consistent with the plans developed by the Soil Conservation Service in 2024 (see **Figure 2** and **Figure 3** below).
- An upgrade to approximately 4 km of Long Swamp Road leading to the flume site. This upgrade to the road will facilitate construction activities and equipment transportation as well as enhance accessibility from the first point of access to just beyond the flume site.
- Potential use of a decommissioned quarry on Towrang Road for the disposal of spoil material.

6.2.2 The stages of the Proposed Activity

Before construction commences, the following tasks will be undertaken:

- Preparation of comprehensive environmental work management plans and safe work management plans.
- Finalisation of the ACHAR and submission of AHIP application
- On ground set up of any mitigation measures consistent with AHIP conditions and as outlined in this REF
- Conducting ecological pre-clearing surveys along the activity alignment.
- Conducting site inductions for all personnel.
- Establishing the site and setting up the construction compound, including the placement of construction signs and safety information.
- Installing any necessary temporary traffic management signage.
- Implementing site erosion and sediment controls with reference to advice provided by DPIRD Fisheries.
- Conducting a survey, flagging, and pegging of the proposed work site and the limit of works.

During construction:

- A 6 metre wide x 4metre high corridor will be cleared to the minimum extent necessary along Long Swamp Road. Damage or removal to trees with a diameter at breast height above 300 mm will be avoided where possible.
- The access road will be minimally upgraded before flume construction to allow for construction vehicle access. Final upgrade works will take place once the flume construction is complete.

Figure 2. Schematics of replacement flume

Batters and Chute slopes: 2:1 or 26.6°

Freeboard: 1 - 1.2 meters

Flume width: 30 meters

Pond length: 11 meters

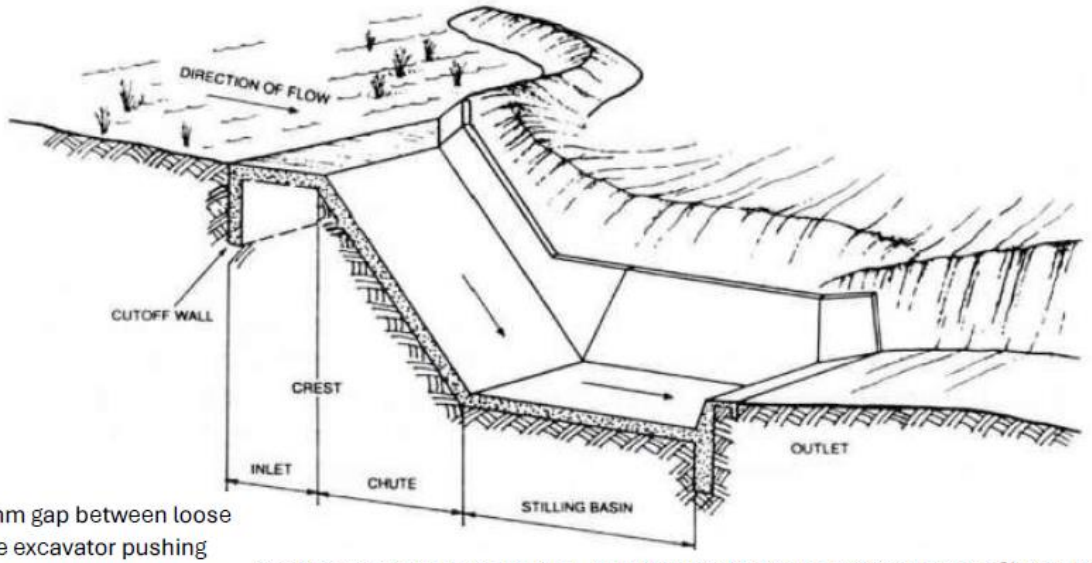
Total Flume and Stilling Basin length: 34 meters

~6000 m3 of soil to excavate and move.

Cut-off trenches may be deeper due to soil quality.

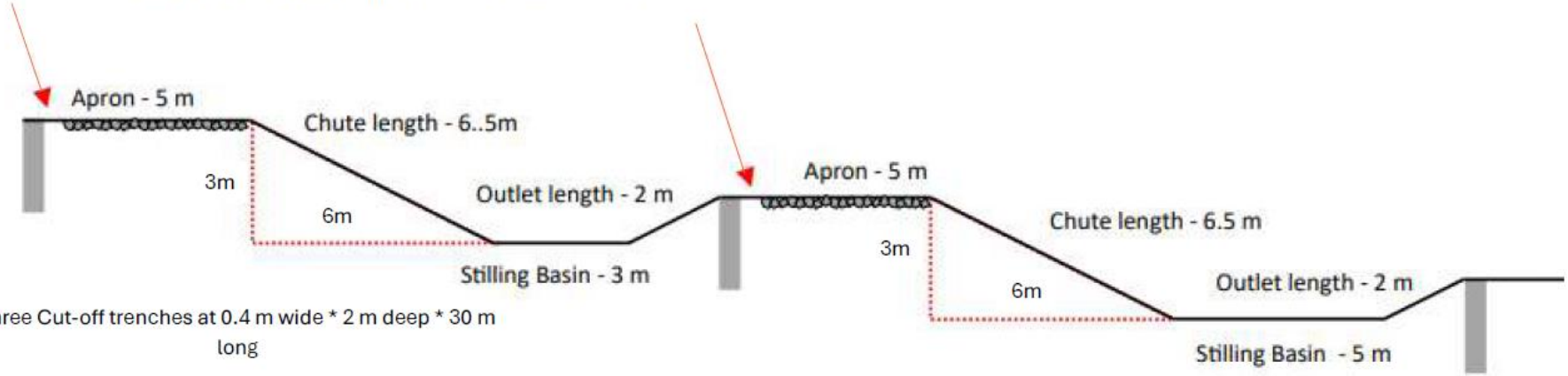
Measurements are estimates. Actual dimensions to be measured at future date.

Drawing will be adjusted accordingly.



Components of a typical concrete flume - Earth Movers Training Course Unit 19, Flumes and Chutes. Page 10.

When placing rock armouring on Apron, ensure that 200 - 500 mm gap between loose edge of rock and concrete cut-off is maintained to prevent the excavator pushing loose rock edge into wall and cracking concrete. Rock will move into partly fill this space. Once Apron armouring is almost finished, place selected small rock to fill voids, and avoid operating Plant too close to concrete wall.



Three Cut-off trenches at 0.4 m wide * 2 m deep * 30 m long

Outlet has an ~1 m vertical rise to finish at or just below natural ground level. Variation may be necessary.

Figure 3. Plans for the Tarlo River flume replacement

Try to salvage existing batter underneath concrete flume as this will significantly reduce the amount of excavation and soil movement required. Remove concrete carefully with a concrete saw and excavator to minimise damage to earth underneath. Batter may need minor shaping to be usable.

Install additional Cut-off trenches at the end of existing adjoining flume to prevent undermining of new flume.

Drainage gully crosses road and enters creek here. Build Boom end out to deflect water flow towards centre of creek bed. Armour to provide protection against scouring.

Clear vegetation, stack on opposite side of road. Backfill with excess excavated soil, pack with roller to create boom. This will provide a staging area for plant as well as storage for rock and other material. Return vegetation as cover at the end of the job.

Finishing level will be natural ground level. Preserve existing settling pond if possible. Minor modification maybe necessary.

After construction:

- The flume will be subject to regular inspections post construction after rainfall events in the first 12 months. Minor ongoing maintenance and monitoring will be required following the first 12 months; however, the proposed activity has been designed to minimise this requirement.

Remediation:

- Topsoil will be salvaged and redistributed in required areas outside the formed corridor of Long Swamp Road.
- Disturbed areas will be protected with jute mat, coir logs and planted with locally endemic species where required to prevent short-term erosion impacts after the flume is completed.

6.2.3 The activity footprint

The existing flume covers an area of approximately 0.26 hectares. The footprint of the proposed replacement flume is estimated to be 0.34 hectares.

The existing formed corridor of Long Swamp Road occupies approximately 1.8 hectares. The proposed road upgrades, including potential turning and passing bays, may impact up to 3.9 hectares. This includes stockpile sites and other ancillary facilities as confirmed by the principle contractor – the Soil Conservation Service on the 10th of February 2025 by email.

The decommissioned quarry is approximately 0.5 hectares in size.

The total estimated footprint of the Proposed Activity is 6.8 hectares.

6.2.4 Proposed construction methods, materials and equipment

Heavy machinery will be used to remove the damaged structure and construct the replacement flume using a combination of concrete and rock sourced from the nearest hard rock quarry.

Equipment:

- excavators
- bulldozers
- rollers
- dump trucks
- water carts.

(See figure 2 and 3 above for more details).

6.2.5 Receival, storage and on-site management for materials used in construction

- Materials will be removed and bought onto site using rigid trucks and/or dump trucks.
- Materials will be stored at the turn around bay north of the flume site, within the mapped Long Swamp Road impact area or unloaded directly into the flume construction area.
- Materials that are stockpiled will have appropriate sediment controls in place and the area will be reinstated to the previous condition.

6.2.6 Earthworks and site clearing

Minimal vegetation clearing will be done on the proposed site with the exception of the flume footprint area. Other vegetation that may require removing will be as needed and to the minimum extent necessary, for example, to ensure safe passage of machinery and trucks on Long Swamp Road.

Earthworks or site clearing for the proposed activity will encompass the total estimated footprint of 6.8 hectares (see Section 6.2.3).

6.2.7 Environmental safeguards and mitigation measures

Below is a summary of the mitigation measures proposed to be carried out as part of the proposed activities. Further detail is provided in Section 9.

Table 1. Mitigation Measures for the Proposed Activity

Environmental aspect	Mitigation measures
General	• Implementing erosion and sediment control measures, an oil spill contingency plan, and safe work procedures. • Utilising a water cart or hose to suppress dust emissions during construction if necessary. • Restricting noise to construction-related activities, limited to normal daylight working hours. • Mandating thorough cleaning of all plant equipment before entering and upon leaving the site to minimise the tracking of dirt and potential spread of weed seeds or soil-borne diseases. • Removal of any temporary structures and equipment upon completion of the works. • Disposing of all waste materials at registered waste disposal facilities. • Prohibiting the idling of plant or vehicles when unattended. • Preferring construction works during dry weather conditions when possible. • Ensuring appropriate sediment and erosion controls are in place before the commencement of earthworks and throughout all construction stages. • Undertaking prompt stabilisation of disturbed areas in accordance with approved methods detailed in "Managing Urban Stormwater: Soils and Construction 4th Ed. The Blue Book, NSW Government, (Landcom 2004)." • Covering stockpiles of gravel during rain events to prevent runoff and soil erosion.
Topography, geology and soils	• Implementation of an Erosion and Sediment Control Plan to be documented in the CEMP. • Work to halt during heavy rain. • If contaminated soils are uncovered during the construction works, all works within the vicinity will cease immediately and the Project Manager and/or Environmental Representative will be notified immediately. • Implement erosion control measures where needed
Contaminated land	• Construction works be undertaken in accordance with a CEMP. • If contaminated soils are uncovered during the carrying out of the proposed activities, all works within the vicinity must cease immediately and the Project Manager is to be notified immediately. • Any excess spoil material, including any material that has been stockpiled during construction works would be classified prior to leaving site. Excess spoil would be managed dependent on its classification. • For any excess spoil where potentially, contaminating activities have been identified on site (including Acid Sulphate Soils) this material would be tested

Environmental aspect	Mitigation measures
	and classified prior to leaving site. For any excess spoil material classified as contaminated, disposal of this material would be at an appropriately licensed landfill in accordance with the EPA Waste Classification Guidelines (2014) • In the event of breakdowns, where the machinery cannot be moved to the designated locations, spill kits will be held on site and used for the plant breakdowns (where necessary) • In the event of any spillages during the proposed activities, NPWS will be contacted immediately. Contaminants would be contained immediately, removed, treated (if necessary) and disposed of satisfactorily according to EPA regulations
Water quality and hydrology	• The proposed works will be carried out according to the procedures documented in a CEMP. This includes implementing appropriate surface water management measures to minimise impacts, as well as preparing an erosion and sedimentation plan. • Drainage lines outside the Proposal Area will be monitored for siltation, with erosion controls being put in place if needed, especially following significant rain events. • Erosion and sediment controls will be designed in accordance with the Blue Book. • Erosion and sediment control measures will be implemented before construction at any stockpiles or work areas to avoid impacts to waterways via stormwater runoff. • Sediment fencing will be installed where works are occurring in close proximity to watercourses. • Erosion and sedimentation measures will be checked and maintained regularly, including clearing sediment from behind barriers. Records will be kept and provided upon request. • Erosion and sediment control measures will not be removed until the works are complete and areas are stabilised. • Water quality control measures will be used to prevent any materials (e.g., concrete, grout, sediment) from entering waterways. • Soil exposure will be limited in time, and disturbed soils will be revegetated immediately after construction ceases in those areas. • No dirty water will be released into drainage lines and/or waterways.
Groundwater	• A procedure will be developed as part of the CEMP and will include: o Established appropriate water quality parameters for the release of water from excavations and identify appropriate release points. o Ensure that all potential management options are considered and that any future release is done so in accordance with all relevant legislative requirements. • If groundwater is intercepted during excavations, it is to be collected and managed in accordance with the CEMP.
Ecology	• In the presence of active nests in the canopy of any trees, promptly contact the project ecologist for guidance on the best course of action. • Include in site inductions a briefing on the local flora and fauna, along with protocols to be followed if fauna is encountered. • Conduct a pre-clearing survey for threatened flora, mammals, and amphibians. • Ensure a qualified person is present during vegetation clearing works. • Clearly mark and fence vegetation to be retained before commencing construction. • Additional clearing works may require ecological inspections and assessment. • Prior to entering and exiting the works area, machinery must be free of weed material to prevent the introduction or spread of weed species.

Environmental aspect	Mitigation measures
	• Remove and dispose of priority weeds (as listed for the South East) at an appropriate waste facility. • Implement erosion and sediment control measures around the works area and associated stockpiles to prevent impacts to waterways via stormwater runoff. • If threatened fauna or flora species are discovered, immediately cease works and contact the Project Manager.
Aboriginal objects and cultural heritage	• Follow any ACHAR mitigation measures. • Ensure AHIP is completed prior to works commencing. • Ensure that all on-site personnel are informed about their obligations under the National Parks and Wildlife Act 1974. This awareness can be achieved through an on-site induction or another suitable format. The induction should cover procedures for identifying and reporting any new or suspected Aboriginal sites, with a particular emphasis on sensitive landscape features in the local area, especially sandstone platforms/outcrops. • In the rare event of uncovering Aboriginal or suspected Aboriginal archaeological material during development, cease all works in that area and cordon it off. The project manager must contact the heritage consultant to assess whether the material qualifies as Aboriginal object/s under the NPW Act. The heritage consultant will then provide guidance on the necessary management and mitigation measures. Works should not resume in the cordoned-off area until heritage clearance is obtained, and/or the required management and mitigation measures have been implemented. • In the unlikely event of discovering human remains or suspected human remains during development, stop all works in that area and cordon it off. The project managers should contact the NSW Police and Heritage NSW. If not a crime scene, and it is likely the remains are Aboriginal, develop management measures in consultation with the local Aboriginal community before resuming works in the area.
Non-Aboriginal relics	• If during the course of the proposed activities, previously unknown historical archaeological material or heritage items are discovered, all work in the area of the item(s) shall cease immediately. The Project Manager will contact Heritage NSW and engage a qualified heritage consultant, in accordance with section 146 of the Heritage Act, to determine an appropriate course of action prior to the recommencement of work in the vicinity of the item.
Noise and vibration	• All works must be undertaken in accordance with construction noise guidelines • Any nearby sensitive receivers must be notified regarding the commencement and duration of construction activities • Any nearby residents and businesses must be made aware of the contact details of the complaints handling system • All works will be undertaken during standard construction hours, being Monday to Friday 7am to 6pm and Saturday 8am to 1pm. OR Where practical, undertake the disruptive works (those causing the most significant noise and vibration impacts) during the standard work hours • Turn off plant that is not being used • Examine, and implement where feasible and reasonable, alternative work practices which generate less noise or vibration impacts • Ensure plant is regularly maintained, and repair or replace equipment that becomes noisy or causes excessive vibration impacts • Arrange the work site to minimise the use of movement alarms on vehicles and mobile plant • All employees and contractors should receive an environmental induction prior to commencement of works. The induction should include but not be limited to:

Environmental aspect	Mitigation measures
	○ relevant project specific and standard noise and vibration mitigation measures ○ permissible hours of work ○ location of nearest sensitive receivers. • Keep truck drivers informed of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices (for example, minimising the use of engine brakes and no extended periods of engine idling). Avoid the use of radios or stereos outdoors where neighbours can be affected, and • Regularly train workers and contractors (such as at toolbox talks) to use equipment in ways to minimise noise.
Air quality	• Limit exposed areas to the smallest possible size and duration. • Regularly water exposed and disturbed areas during dry and windy weather conditions. • Maintain dust suppression measures throughout the entire duration of the proposed activities. • Adjust the intensity of activities based on prevailing weather conditions. • Minimise the extent of loose materials stockpiled at the site whenever possible. • Position stockpiling areas away from drainage lines and cover or stabilise them if in place for longer than 10 days. • Conduct inspections of machinery, plant, and equipment before commencing on-site works. • Ensure that machinery, plant, and equipment used in construction adhere to appropriate operating standards, with regular inspections to ensure efficient operation. • Avoid leaving machinery idling or running when not in use. • Stabilise all land disturbed by earthworks before decommissioning the activity area.
Traffic and transport	• Detail any specific traffic management measures within the CEMP and consult with local residences and businesses
Waste	• Waste generated by the proposed activities would be recycled as a first preference. The handling, transport and disposal/re-use of materials should be undertaken in accordance with regulatory and statutory requirements; and • Construction works to be undertaken in accordance with a CEMP.
Visual amenity	• Maintain the site, including the site compound, in an orderly state throughout the proposed activities. • Install temporary signage around the works area for the project's duration. • Clear the work site and any adjacent areas of all materials and refuse upon the completion of the proposed activities. • Restore the work site to its original state as closely as possible upon the completion of the proposed activities.
Socio-economic	• Appropriate signage to be erected and WH&S safeguards employed for the general public and users. • Works are to be undertaken during standard construction hours, being 7am to 6pm Monday to Friday and 8am to 1pm Saturday.

6.2.8 Sustainability measures

The selection of hard rock from the nearest quarry as a material for construction primarily aims to ensure the longevity and durability of the remediated structure and the protection of the waterway, particularly in areas subject to high water velocity.

6.2.9 Construction timetable and staging and hours of operation

Works are to be undertaken during standard construction hours, being 7am to 6pm Monday to Friday and 8am to 1pm Saturday.

7. Reasons for the activity and consideration of alternatives

7.1 Objectives and reasons for the proposal

The key reason for the proposal is to provide a long-term solution to the structural failure of the existing flume by addressing the root causes of the problem and ensuring the reliability and effectiveness of the water conveyance system in the Tarlo River catchment area.

A secondary objective is to upgrade Long Swamp Road, to improve access to Tarlo River National Park for management operations.

7.2 Consideration of alternatives

Several alternative options were considered.

One option is to replace the failed concrete flume with a new concrete structure, rather than a rock flume. However, a new concrete flume is not likely to be compatible with the local shrink/swell conditions and could fail.

Another option is to do nothing and leave the existing concrete flume in place, without taking any further action to address the structural failure. However, this option would result in ongoing maintenance costs, increased risk of further failures, and increasing environmental impacts due to bed lowering continuing upstream. This would risk other upstream structures, release further sediment and nutrient into the catchment, and impact the hydrology and native vegetation of the surrounding landscape.

7.3 Justification for preferred option

The preferred option of replacing the structurally failed concrete flume with a new rock flume is justified for several reasons:

- Firstly, the rock flume is specifically chosen for its compatibility with the local shrink/swell soil conditions, minimising the risk of further structural failures due to soil-related issues. Secondly, the rock flume is expected to be more durable and reliable than a concrete flume, particularly in the face of dispersive soils and recent drought and flood events.
- Additionally, the new flume is designed to manage an estimated discharge capacity of 69 m^3/sec during a 1:100 (1%) rainfall event, ensuring that it can adequately handle peak flow conditions. The expansion of the flume's footprint to accommodate the larger structure further ensures its ability to manage increased flow capacity without causing structural issues.
- The upgrade of the 4 km of Long Swamp Road leading to the flume site will improve construction access and facilitate equipment transportation, ensuring smooth and efficient project execution. Moreover, the enhanced accessibility from the first point of access to just beyond the flume site benefits the ongoing maintenance and operation of the flume system, and future park management operations. If the works are not completed to upgrade the track and replace the flume, it is probable that vegetation will continue to decline due to erosion issues currently experienced within the existing flume alignment.

Overall, this preferred option provides a comprehensive and effective approach to address the structural failure of the existing flume and ensure the long-term reliability and effectiveness of the water conveyance system in the Tarlo River catchment area.

8. Description of the existing environment

8.1 Overview of the Proposal Area

The Proposal Area is situated in the NSW Southern Tablelands, approximately 30 kilometres north-east of Goulburn. Goulburn, Taralga and Marulan are the nearest towns. The area surrounding Tarlo River National Park has been largely cleared for grazing. Most of the south-eastern section of the national park drains into Junction Creek, a tributary of the Tarlo River downstream of the park. This is where the flume replacement works will occur.

8.2 Natural values

8.2.1 Geology, geomorphology, and topography

The Proposal Area encompasses varying topography, with works on Long Swamp Road ranging from 710 metres above sea level (ASL) in the south to 657 metres ASL in the north. The flume is situated at an elevation of 660 metres ASL. The quarry, located on Towrang Road, features a gentle slope from 798 to 801 metres ASL.

The geology of the Proposal Area is characterised by a diverse range of sediments and metasediments, primarily from the Ordovician and Silurian periods. These sediments have undergone extensive folding, often isoclinally, which has resulted in a variety of landforms, from hilly terrain to steep, precipitous hills and mountains. The geology of the area is further characterised by the presence of Devonian Lambie Group sediments of sandstone, shale and slate along the western boundary, and Silurian limestone, shale and quartzite of the Taralga Group in the Kerrawary Creek area.

Reference material

Department of Planning, Industry and Environment, 2020, *Soil Landscapes of Central and Eastern NSW - v2.1*, NSW Office of Environment and Heritage, Sydney.

8.2.2 Soil types and properties

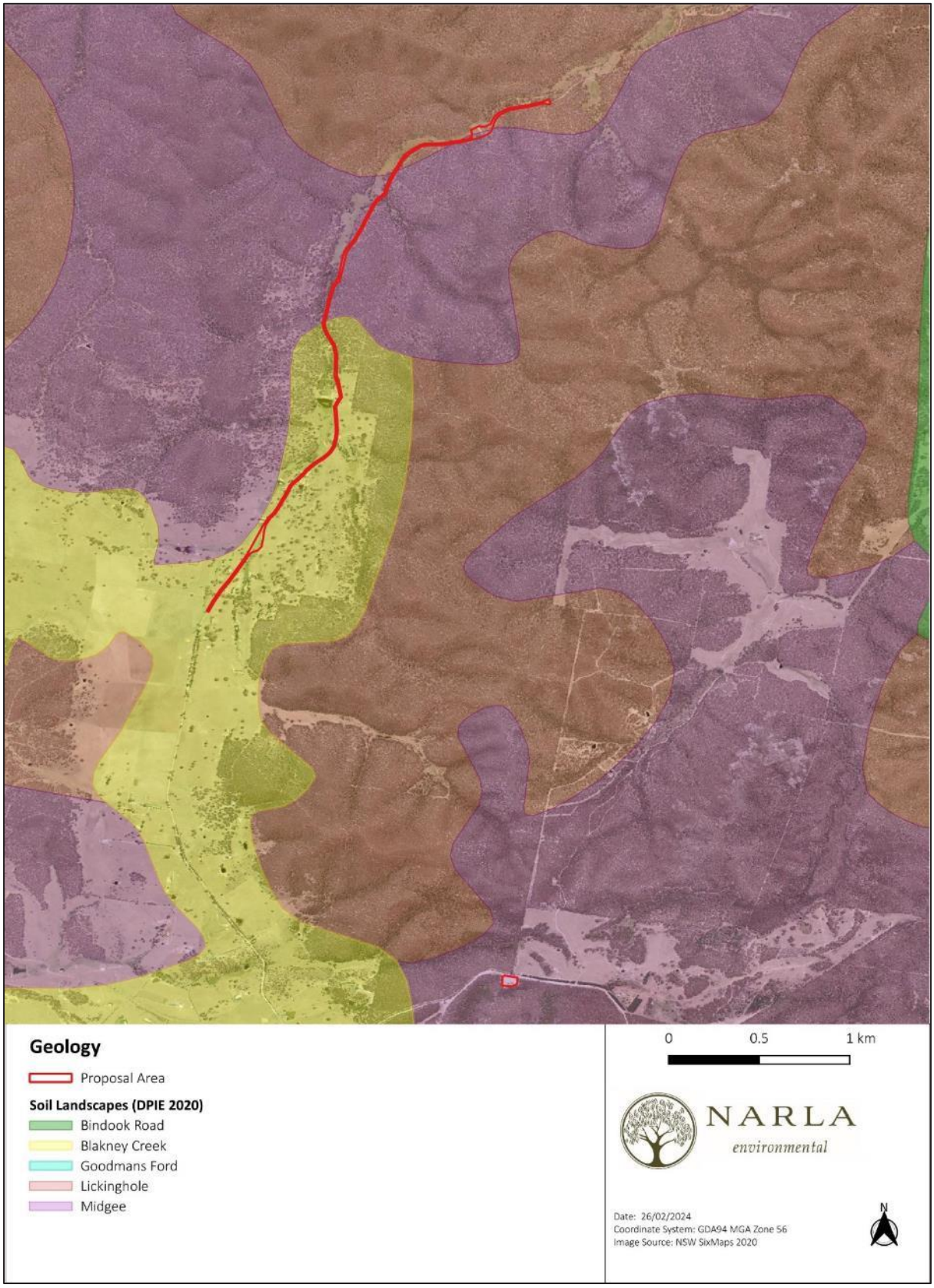
A search of the Department of Planning and Environment's eSpade tool was undertaken on 10 November 2023. Three mapped soil landscapes occur across the Proposal Area as described by DPIE 2020, Soil Landscapes of Central and Eastern NSW - v2.1:

- Midgee Soil Landscape: This soil landscape is linked with Ordovician and some Devonian and lower Silurian sediments and metasediments in hilly terrain. The predominant soils in this landscape are Yellow Earths (Gn2) and Yellow Podzolic Soils (Dy2) and their intergrades. These soils are typically stony and acidic. Other soil types found here include Red Podzolic Soils, Lithosols, Soloths and Red Earths.
- Blakney Creek Soil Landscape: This soil landscape is generally associated with undifferentiated Ordovician and early Silurian sediments where they occur alongside footslopes, valley floors or other landform patterns with slope gradients typically less than 10%. These areas are characterised by acid to neutral yellow duplex soils featuring bleached A2 horizons (Soloths or Yellow Podzolic Soils – Dy2.41, Dy2.42, Dy3.41, Dy3.42) along with minor Yellow Solodic Soils on footslopes and lower slopes.

- Lickinghole Soil Landscape: This soil landscape is found on steep to precipitous hills and mountains, predominantly on various Ordovician metasediments. It is characterised by shallow, stony, fine sandy to loamy Lithosols (K-Uc and K-Um) as well as shallow Red and Yellow Earths (Gn2) on crests and side slopes. In mid and lower slope positions, minor, generally stony, and shallow Red and Yellow Podzolic Soils (Dr2 and Dy3) are common. Additionally, some rock outcrops are present in this landscape.

No acid sulphate soils are mapped as occurring within the Proposal Area.

Figure 4. Geology of the Proposal Area



Reference material

Department of Planning, Industry and Environment (2020) *Soil Landscapes of Central and Eastern NSW - v2.1*, NSW Office of Environment and Heritage, Sydney.

Naylor SD, Chapman GA, Atkinson G, Murphy CL, Tulau MJ, Flewin TC, Milford HB and Morand DT (1998) *Guidelines for the Use of Acid Sulfate Soil Risk Maps*, 2nd ed., Department of Land and Water Conservation, Sydney.

8.2.3 Watercourses, waterbodies and their catchments

The Proposal Area is intersected by several watercourses, including ten (10) 1st order, four (4) 2nd order, three (3) 3rd order, and one (1) 5th order watercourse, known as Junction Creek. Junction Creek is a tributary of the Tarlo River, which reaches its confluence with the Wollondilly River near Mount Penong, east of Taralga. The Tarlo River is part of the Hawkesbury-Nepean catchment.

The Hawkesbury-Nepean catchment is a regulated catchment under the Biodiversity and Conservation SEPP.

Design considerations for the proposal have been made with the aim of reducing water velocity to remediate the affected area. Additionally, these measures are intended to aid in preserving and naturally rehabilitating the area downstream.

See Appendix D: Mapped watercourses in Proposal Area.

Reference material

NSW DCS Spatial Services (2024) Upper Lachlan Shire Cadastre and Topography.

8.2.4 Coasts and estuaries

No coastal or estuarine areas are in the vicinity of the Proposal Area.

8.2.5 Biodiversity

Overview of terrestrial and aquatic biodiversity

The following vegetation communities were recorded during the site assessment by Narla Ecologists Elly Baker and Brodie Miller (5 December 2023):

- PCT 3387 Central West Creekflat Grassy Woodland which is partially associated with:
  - Critically Endangered BC Act Listed 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 Riverina Bioregions (White Box - Yellow Box - Blakely's Red Gum Grassy Woodland)
  - Critically Endangered EPBC Act Listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- PCT 3747 Southern Tableland Western Hills Scribbly Gum Forest
- Exotic Vegetation/Cleared Land

PCT 3387 Central West Creekflat Grassy Woodland

PCT 3387 Central West Creekflat Grassy Woodland is present within the northern extent of the Proposal Area. It surrounds Long Swamp Road in moderate condition overall, with all strata present. However, the vegetation around Long Swamp Road has signs of disturbance and erosion due to track usage. PCT 3387 within the flume footprint and Junction Creek is in lower condition due to severe erosion and periodic water influx and has very minimal tree coverage.

The native tree canopy in areas mapped as PCT 3387 includes but is not limited to *Eucalyptus blakelyi*, *Eucalyptus melliodora* and *Eucalyptus bridgesiana*. The shrub layer is sparse, and includes scattered *Acacia dealbata, Cassinia spp.* and *Bursaria spinosa*. The ground layer comprises native species like *Microlaena stipoides*, *Echinopogon ovatus*, *Poa labillardierei*, and *Themeda australis*, as well as *Carex appressa*, *Haloragis heterophylla*, *Juncus subsecundus*, *Geranium solanderi*, *Glycine clandestina*, *Gonocarpus tetragynus*, *Hypericum gramineum*, *Dichelachne micrantha*, *Hydrocotyle laxiflora* and *Acaena ovina*.

This area contains key diagnostic species and occurs within the correct IBRA 7 Bioregion to be considered to align with the BC Act Listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland. It also meets the condition classes to adhere to the Critically Endangered EPBC Act Listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (as listed in **Table 2**). As such, a test of significance has been undertaken for the areas of this PCT occurring within the Proposal Area.

Table 2. Minimum requirements to meet EPBC listing criteria for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (DEH 2006).

Thresholds	White Box Grassy Woodland
Has a predominantly native understorey	Yes
The patch size is 0.1ha or greater	Yes
Has twelve (12) or more native understorey species present (excluding grasses)	Yes

PCT 3747 Southern Tableland Western Hills Scribbly Gum Forest

PCT 3747 Southern Tableland Western Hills Scribbly Gum Forest within the Proposal Area is characterised by scattered trees and a minimal mid-storey, largely dominated by *Acacia dealbata* and *Ozothamnus diosmifolius*. This area appears to undergo continual management of the understorey through grazing and/or mowing, with a large proportion of the ground layer occupied by exotic pasture grasses. Notable tree species include, but were not limited to, *Eucalyptus macrorhyncha*, *Eucalyptus rossii* and *Eucalyptus goniocalyx*. Shrubs present, among others, were *Acacia dealbata*, *Acacia decurrens*, *Brachyloma daphnoides* and *Dillwynia sericea*. The ground layer hosted native species like *Lomandra filiformis*, *Poa sieberiana*, *Dichelachne micrantha*, *Gonocarpus tetragynus* and *Goodenia hederacea*.

Exotic vegetation/cleared land

According to the EPBC Listing Advice, where the native ground layer remains intact in the absence of a tree canopy or where relatively few trees are present, this is considered to be 'derived grassland' and may still be part of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. However, this is not considered to be the case for areas within the Proposal Area (pastures and the decommissioned quarry) mapped as Exotic Vegetation/Cleared Land, where the ground layer is dominated by exotic grasses such as *Lolium spp*, *Axonopus fissifolius*, *Digitaria sanguinalis* and *Cenchrus clandestinus*, among others. Other exotic species in these areas include the Priority Weed *Rubus fruticosus* and the environmental weed *Cirsium vulgare*. Minimal native species exist in these areas but include sporadic instances of species such as *Lomandra filiformis*, *Dichelachne micrantha*, *Goodenia hederacea* and *Wahlenbergia stricta*.

Key Fish Habitat

According to the policy definition of Key Fish Habitats (NSW DPI 2024), intermittently flowing rivers and creeks that retain water in a series of disconnected pools after flow ceases, including those where the flow is modified by upstream dams, are considered as such, extending up to the top of the natural bank regardless of physical modifications to the channel. Junction Creek meets this description. The site assessment conducted by Narla Ecologists Elly Baker and Brodie Miller on 5 December 2023, identified several shallow, small pools within the flume footprint. However, no fish were present during the assessment. An inventory of habitat features in the Project Area's waterways is given in **Terrestrial and** aquatic habitat features recorded in the Proposal Area during the site assessment on 5 December 2023 are listed in **Table 3**.

Table 3.

Habitat features

Terrestrial and aquatic habitat features recorded in the Proposal Area during the site assessment on 5 December 2023 are listed in **Table 3**.

Table 3. Habitat features recorded in the Proposal Area

Type of Habitat	Easting	Northing	Tree number (if applicable)
Burrow (Large)	217587	6171627	N/A
Burrow (Large)	218919	6174773	N/A
Burrow (Large)	219310	6169111	N/A
Soak (with tadpoles present as of site assessment)	219294	6169099	N/A

Type of Habitat	Easting	Northing	Tree number (if applicable)
Soak (with tadpoles present as of site assessment)	218999	6174831	N/A
Coarse Woody Debris	219011	6174838	N/A
Coarse Woody Debris	218921	6174851	N/A
Habitat Tree (3 x medium hollows)	217632	6171710	BHT1
Habitat Tree (1x medium hollow)	217890	6172192	BHT2
Habitat Tree (1x small hollow)	217939	6172281	BHT3
Habitat Tree (2x medium hollow)	218213	6173209	BHT4
Habitat Tree (1x large hollow)	218210	6173285	BHT5
Habitat Tree (2x medium hollow)	218205	6173297	BHT6
Habitat Tree (3 x medium hollows)	218143	6173528	BHT7
Habitat Tree (2x medium hollow)	218344	6174178	BHT8
Habitat Tree (3x small hollow)	219055	6174905	BHT9
Habitat Tree (2x small hollow)	217587	6171627	EBHT01
Habitat Tree (1x medium hollow)	218311	6174101	EBHT10
Habitat Tree (2x small hollow)	219006	6174796	EBHT11
Habitat Tree (1x medium hollow)	219185	6174963	EBHT12
Habitat Tree (3 x medium hollows)	219251	6174989	EBHT13
Habitat Tree (3 x medium hollows)	217587	6171627	EBHT02
Habitat Tree (4x small hollow)	218212	6173115	EBHT03
Habitat Tree (1x small hollow)	218213	6173129	EBHT04
Habitat Tree (1x large hollow)	218201	6173335	EBHT05
Habitat Tree (1x small hollow)	218184	6173376	EBHT06
Habitat Tree (1x small hollow)	218178	6173379	EBHT07
Habitat Tree (3 x medium hollows)	218142	6173476	EBHT08
Habitat Tree (1x medium hollow)	218224	6173837	EBHT09

Reference materials

Department of Climate Change, Energy, the Environment and Water (2023). Conservation Advice for the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. www.environment.gov.au/biodiversity/threatened/communities/pubs/43-conservation-advice.pdf

NSW Department of Primary Industries (2024) Key Fish Habitat Maps. www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/key-fish-habitat-maps

NSW DPE (2022) NSW State Vegetation Type Map

NSW DPE (2024) BioNet Vegetation Classification

NSW Threatened Species Scientific Committee (2020) Final Determination to list 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

Riverina Bioregions. www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Scientific-Committee/Determinations/2020/white-box-yellow-box-final-determination-ceec.pdf

Areas of outstanding biodiversity value or critical habitat

No areas of outstanding biodiversity value or critical habitat are present in or near the Proposal Area.

Environmental assets of intergenerational significance (AIS)

No areas declared to be an AIS are within or near the Proposal Area.

Threatened ecological communities

PCT 3387 Central West Creekflat Grassy Woodland is present within the northern extent of the Proposal Area.

This area contains key diagnostic species and occurs within the correct Bioregion to be considered to align with the BC Act Listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland. It also meets the condition classes to adhere to the Critically Endangered EPBC Act Listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Some impacts to this vegetation cannot be avoided due to construction requirements, especially the vegetation present within the flume footprint. Up to 2.48 ha of BC Act Listed White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and EPBC Act Listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland will be affected by the Proposal, however this area of impact has been calculated on the following assumptions:

- Full clearing of a 2 metre buffer on either side of Long Swamp Road for track upgrades
- Partial impacts to trees overhanging Long Swamp Road (e.g. pruning to allow vehicle access)
- Full clearing of the flume upgrade footprint.

Impacts to vegetation will be mitigated and so it is likely that the actual impacts resulting from the Proposed Activity will be lower than 2.48 ha.

Threatened species and populations

A thorough literature review of local information relevant to the Upper Lachlan LGA was undertaken. Searches using NSW Wildlife Atlas (also known as BioNet DPE 2024) and the Commonwealth Protected Matters Search Tool (DCCEEW 2024) were conducted to identify all current threatened flora and fauna, as well as migratory fauna records within a 10 km (BioNet) or 10 km (PMST) radius of the activity area. These data were used to assist in establishing the presence or likelihood of any ecological values as occurring on or adjacent to the activity area and helped inform the site assessments.

A site assessment was undertaken by Narla Ecologists, Brodie Miller and Elly Baker, on 5 December 2023. During the site assessments, the following activities were undertaken:

- recording a detailed list of flora species encountered on the Subject Site, with a focus on threatened species, species diagnostic of TECs and Priority Weeds
- recording opportunistic sightings of any fauna species seen or heard on or within the immediate surrounds of the Subject Site

- identifying and recording the locations of notable fauna habitat such as important nesting, roosting or foraging microhabitats
- assessing the connectivity and quality of the vegetation within the Subject Site and surrounding area
- any other habitat features that may support fauna (particularly threatened) species
- targeting the habitat of any threatened and regionally significant fauna including:
    - tree hollows (habitat for threatened large forest owls, parrots, cockatoos and arboreal mammals)
    - caves and crevices (habitat for threatened reptiles, small mammals and microbats)
    - termite mounds (habitat for threatened reptiles)
    - soaks (habitat for threatened frogs)
    - wetlands (habitat for threatened fish, frogs and water birds)
    - drainage lines (habitat for threatened fish and frogs)
    - fruiting trees (food for threatened frugivorous birds and mammals)
    - flowering trees (food for threatened nectivorous mammals and birds)
    - trees and shrubs supporting nest structures (habitat for threatened birds and arboreal mammals)
    - logs, bark, and artificial debris (habitat for threatened frogs, reptiles and snails.

'Clearing of native vegetation' is listed as a Key Threatening Process under the BC Act and applies to the Proposed Area. However, if the Proposed Activity was not to proceed it is likely that the vegetation within the flume footprint and on Junction Creek, would continue to degrade in condition. In addition, the vegetation clearing as a result of the Proposed Activity will be minimal with a large amount of habitat retained in the greater locality.

Koala Habitat

The Upper Lachlan Shire is a listed LGA in Schedule 2 of the Biodiversity and Conservation SEPP and is part of the Central and Southern Tablelands Koala Management Area (KMA). While the SEPP does not apply to land reserved under the NPW Act, it is NPWS policy that the Proposed Activity is consistent with Koala Plans of Management (KPOMs) and the landscape management of koalas and their habitat. No KPOM has been adopted for the Upper Lachlan Shire.

The Central and Southern Tablelands KMA (or KMA 5) extends from the Mudgee and Bathurst districts west of Sydney, south through Goulburn and Yass to the foothills of the Victorian Alps. Sparse and patchy koala populations live at high elevations, mostly to the east and north-east of Cooma and in the Bathurst–Cowra–Mudgee–Lithgow area. Other records of koalas scattered throughout this region include sightings around Goulburn, in Bungonia State Conservation Area and Mundoonen Nature Reserve. Koalas are mostly found in rugged, infertile woodlands and forests in this area, probably a consequence of land clearing and agricultural development in the fertile flats.

The impact on koalas resulting from the Proposed Activity will be minimal. The removal of trees will be selective, and the pre-clearing survey and clearing supervision will be conducted by a qualified ecologist, ensuring that any potential adverse effects on koalas and their habitat are minimised. Furthermore, the broader area has large habitat connectivity, providing alternative habitats for koalas to utilise. Additionally, revegetation efforts will follow the works, further enhancing the habitat for koalas and other wildlife.

8.3 Cultural values

8.3.1 Aboriginal cultural heritage

A search of the NSW Government's Aboriginal Heritage Information Management System (AHIMS), conducted on 5 December 2023, identified no registered sites within the Project Area or its immediate vicinity. The closest registered site at that time was an artefact site [redacted].

Given the proximity of the proposal to a waterway, the area is within a landscape with a high likelihood of evidence of previous Aboriginal occupation. A survey of the Project Area was carried out in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010). This survey was conducted by Kylie McDonald and James McGuiness of Heritage Now, along with Chris McAlister of Pejar Local Aboriginal Land Council, on 24 January 2024. The survey involved traversing the area on foot, typically maintaining a 2-metre spacing whenever feasible. Emphasis was placed on examining ground exposure and mature trees within the Project Area.

The primary objective of the survey was twofold: to identify surface-level material evidence of Aboriginal occupation and to assess the archaeological potential. This assessment aimed to uncover non-visible material traces or evidence of Aboriginal land use that may be present beneath the ground surface.

Two artefact scatters, along with associated areas of Potential Archaeological Deposit (PAD), were discovered at [redacted]. Additionally, an area of [redacted]

The artefacts and PADs found within the Project Area are characteristic of the archaeological record in the Upper Lachlan Shire, consisting of open sites with artefacts and/or PAD. As such, they are not considered rare. However, their location on the edge of the Tarlo River National Park, which has seen limited archaeological investigations, suggests that these sites hold research potential to enhance our understanding of Aboriginal occupation and land use in the area.

A summary of findings is provided in Table 4. More detail is available in the report by Heritage Now (2024) and the Aboriginal Cultural Heritage Assessment Report (in prep).

Table 4. Aboriginal sites found through site survey

Site ID	Description
TRNP-AFT01	• [redacted]

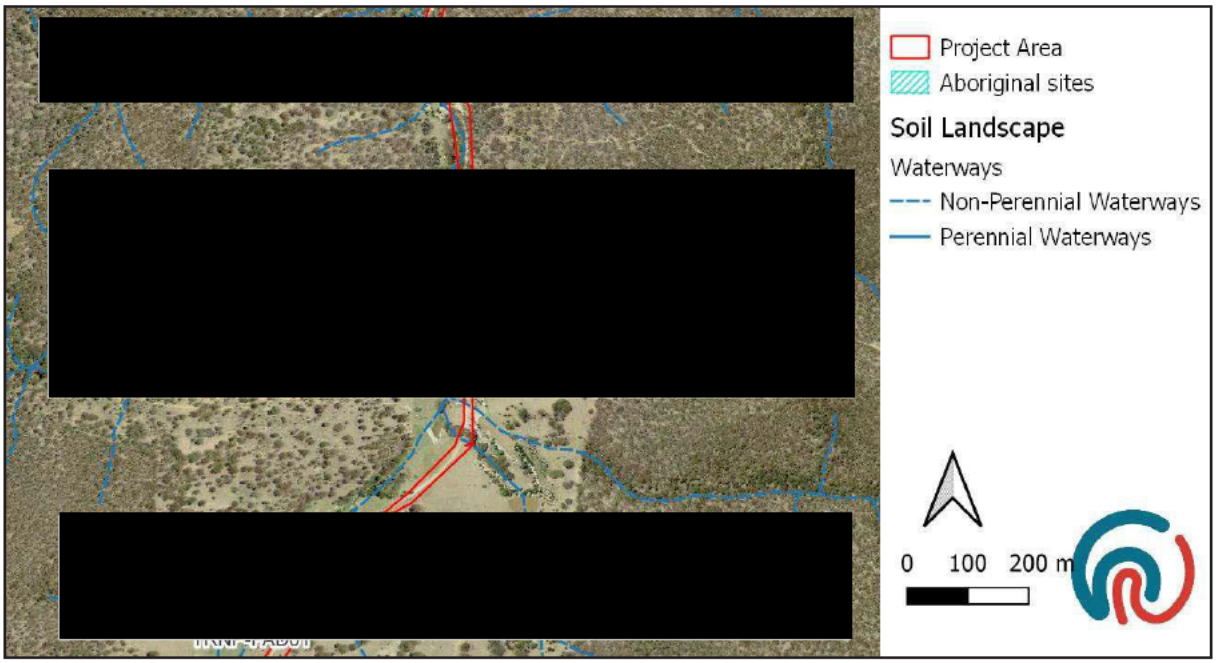
Site ID	Description
TRNP-AFT02	[redacted]
TRNP-PAD01	[redacted]

Reference material

Heritage Now (2024) Aboriginal Cultural Values Due Diligence Report: Flume Replacement and Track Upgrade, Tarlo River National Park.

Department of Environment, Climate Change and Water (2010), Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales, www2.environment.nsw.gov.au/publications/due-diligence-code-practice-protection-aboriginal-objects-new-south-wales.

Figure 5. Aboriginal sites identified during the survey



8.3.2 Historic heritage values

A search of the NSW State Heritage Inventory was undertaken on 20 February 2024. Tarlo River National Park is listed as an item of local heritage significance under the Upper Lachlan Shire Local Environmental Plan (LEP). The LEP listing (Item #160) relates purely to the national park's natural heritage and not to individual historic sites. Tarlo River National Park is valued as a scientific, educational and scenic resource within an extensively cleared pastoral district. NPWS consulted with Upper Lachlan Shire Council via email. See DOC25/97990.

Upper Lachlan Shire Council has no objections to the work.

Reference material

NSW Government (2024), State Heritage Inventory – Tarlo National Park, www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=1480182.

8.4 Social values

8.4.1 Recreation values

The area of Tarlo River National Park that intersects with the Proposal Area currently experiences limited recreational use due to restricted public access. This is primarily due to the presence of private properties in the southern extent of the Proposal Area. Recreation values are not expected to substantially change as a result of the Proposed Activity.

8.4.2 Scenic and visually significant areas

The Proposal Area does not provide much visual significance as it can only be viewed by those using the Long Swamp Road. The broader locality does contain scenic value however, owing to its location in Tarlo River National Park, these values are not expected to substantially change as a result of the Proposed Activity.

8.4.3 Education and scientific values

The proposed activity is unlikely to impact any educational or scientific values that the Proposal Area might contain.

8.4.4 Interests of external stakeholders

NPWS has signed an agreement with the landholder who owns land adjacent to Long Swamp Road, south of the flume site where work will be required. They have no objections to the work. See DOC24/755352.

NPWS has also consulted with the landholder to the north of the site who uses Long Swamp Road for access. They have no objections to the work.

8.5 Matters of National Environmental Significance

An EPBC Act Protected Matters Search was generated on 4 December 2023 within a 10 km radius surrounding the Proposal Area. **Table 5** provides a summary of the Matters of National Environmental Significance (MNES) assessment which is further addressed in **Section 9.7**.

Table 5. Matters of National Environmental Significance Summary.

MNES	Results	Comment
Threatened Ecological Communities	2	PCT 3387 Central West Creekflat Grassy Woodland is present within the northern extent of the Proposal Area. The vegetation in this area meets the condition classes to adhere to the Critically Endangered EPBC Act Listed White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
Threatened Species	46	No threatened flora or fauna species were observed within or near the Proposal Area during the site assessment on 5 December 2023. Breeding habitat, such as hollow-bearing trees, coarse woody debris, and burrows, were observed within the Proposal Area during the site assessment. Potential foraging habitat for threatened fauna species, including nectar and seed-bearing trees, was present. The likelihood of occurrence of threatened flora and fauna species along the Proposal Area is outlined in **Appendix A**. It was deemed that the Proposed Activity will have no significant impact on these species; therefore, no EPBC Act Referral to the Commonwealth will be required.
Migratory Species	11	No EPBC Act listed migratory species were identified within the Proposal Area, however these species have a potential to utilise habitat along the Proposal Area (e.g. foraging or passage) during part of their lifecycles. The Proposed Activity will have negligible impacts to potential foraging habitat and negligible impacts to potential breeding habitat for these species given their migratory nature and extensive areas of suitable foraging habitat in the surrounding area and in their migratory range. As such, the Proposal will have no significant impact on these species.
Ramsar Wetlands of International Importance	0	N/A
Commonwealth Marine Areas	0	N/A

MNES	Results	Comment
World Heritage Properties	0	N/A
National Heritage Places	0	N/A
Great Barrier Reef Marine Park	0	N/A
Nuclear Actions	0	N/A
A Water Resource, in relation to coal seam gas development and large coal mining development	0	N/A

9. Impact assessment during all stages of the activity

9.1 Physical and chemical impacts

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. impact on soil quality or land stability?	Yes	Low (negative) during construction High (positive) post-construction	The current state of the flume reveals severe erosion, and without intervention, the degradation is likely to continue. The proposed project, despite its potential to impact soil quality and land stability during demolition of the current structure and the construction of the new structure and track upgrades, is expected to have a low impact on the environment. The project aims to address the ongoing erosion issues by implementing measures that improve soil and land stability. While excavation and construction activities, especially in areas with dispersive soils, can lead to soil erosion and sedimentation, the project's focus on enhancing soil and land stability aims to mitigate these potential impacts. Additionally, the expansion of the flume's footprint is intended to alter the natural drainage patterns and improve the overall stability of the land, reducing the risk of future soil erosion and land instability.	A Construction Environmental Management Plan (CEMP) will be prepared to address: • Any requirements associated with statutory approvals • Details of how the project will implement the identified safeguards outlined in the REF • Issue-specific environmental management plans. The proposal shall be undertaken in accordance with the approved methods as detailed in Managing Urban Stormwater: Soils and Construction 4th Ed. The Blue Book (Landcom 2004), including the implementation of erosion and sedimentation controls. Site-specific Erosion and Sedimentation Control Plans (ESCP) will be developed where required. This will involve: • Early set up and implementation of sediment management devices • Measures to divert or capture and filter water prior to discharge. • Ground disturbance and vegetation clearing would be limited to the minimum extent required to undertake the proposal. • Stockpiling only in approved locations and surrounded by sediment fencing. • Work areas to be stabilised and rehabilitated where required, progressively during the works

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
2. affect a waterbody, watercourse, wetland, or natural drainage system – either physically or chemically (e.g. due to runoff or pollution)?	Yes	Low (negative – during construction) Medium (positive – post construction)	Some low negative impacts could arise from the Proposed Activity. The disturbance caused by the replacement process of the flume can lead to increased sedimentation in the creek. This can degrade water quality and harm aquatic organisms by reducing light penetration and oxygen levels. The construction process itself can introduce pollutants such as sediment, chemicals, or waste into the waterbody if not properly managed. However, a positive impact is that the rock flume is a more natural and porous option compared to a concrete flume, which means it allows for better water flow and groundwater recharge. This can improve the overall health of the waterbody by providing better habitat for aquatic organisms and reducing the risk of flooding or erosion.	• Management measures would be implemented in accordance with the proposed works procedures documented in a CEMP and would include appropriate surface water management measures to minimise impacts and the preparation of an erosion and sedimentation plan. • Drainage lines outside the Proposal Area should be monitored for siltation with erosion controls being put in place if required. This is particularly important following significant rain events. • Erosion and sediment controls designed in accordance with the Blue Book • Erosion and sediment control measures implemented prior to construction at any stockpiles or work areas to avoid impacts to waterways via stormwater runoff. • Sediment fencing being installed where works are occurring in close proximity to watercourses. • Erosion and sedimentation measures to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request. • Erosion and sediment control measures not being removed until the works are complete, and areas are stabilised. • Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment) entering waterways. • Limit time soils are exposed and revegetate disturbed soils (as required) immediately after construction ceases in those areas. • No release of dirty water into drainage lines and/or waterways
3. change flood or tidal regimes, or be affected by flooding?	No	N/A	N/A	N/A
4. affect or be affected by coastal processes and coastal hazards, including those under climate change	No	N/A	N/A	N/A

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
projections (e.g. sea level rise)?				
5. involve the use, storage, or transport of hazardous substances, or use or generate chemicals which may build up residues in the environment?	Yes	Low (negative)	The only use of potentially hazardous substances will be the fuels and fluids required for machinery and vehicle operation. There is negligible risk associated with the transportation of such fuels and fluids in well maintained vehicles.	• Any reportable spills will be immediately reported to the EPA in accordance with the POEO Act and DPIE. • Refuelling will be undertaken on flat, clear surfaces 40m away from tributaries and drains. • Plant and vehicles must not be cleaned or washed down on-site. Such activity must be undertaken in a suitable location outside of the Proposal Area or parks. Wash down of all plant equipment must follow the NSW DPI Decontamination of Vehicles and Equipment Policy (NSW DPI 2015). • Storage of chemicals should be undertaken in line with relevant legislation, policy and guidelines including the PoEO Act and its regulations as amended. • All chemical usage must be undertaken in line with relevant recommendations of a Material Safety Data Sheet (MSDS). • Pre-start vehicle checks should be conducted at the beginning of each day during construction works and any leaking fuel or fluid tanks must be repaired before access to Proposal Area.
6. involve the generation or disposal of gaseous, liquid, or solid wastes or emissions?	Yes	Negligible (negative)	Vehicular movements associated with the proposal will produce minor emissions. Some solid wastes may be excavated during the proposal.	• Vehicle access associated with the Proposal will be minimised to what is considered necessary. • Vehicles will not be left idling for longer than required. • Vegetation removed during construction to be mulched (if suitable) and reused on-site. • Woody debris will be relocated outside the Proposal Area where possible to retain habitat values and future nutrient cycling potential. • Contractors are to manage all wastes produced during construction phase under CEMP. • Waste shall be managed using the resource management hierarchy principals: avoid, minimise, reuse, and disposal. Materials not suitable for re-use on site (as determined by the stockpile testing) shall be classified in accordance with the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA 2014) and disposed of offsite or placed in

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
				areas that minimise potential impact (where possible) and where it is lawful to reuse. Disposal shall be compliant with the POEO Act and Regulations.
7. involve the emission of dust, odours, noise, vibration, or radiation?	Yes	Negligible (negative)	The project may involve emissions of dust and noise, particularly during activities such as excavation and material transport, especially in areas with dispersive soils. However, the proposed works are expected to have a negligible impact on sensitive receivers surrounding the Proposal Area due to the isolated nature of their proximity.	• Hoses will be used to suppress the emission of dust during construction if required. • Vehicles will not be left idling for longer than required. • Noise will be restricted to that involved with construction and occur only during normal daylight working hours. • As part of the CEMP, noise mitigation and complaint handling procedures would be addressed. • All vehicles and machinery will comply with industry noise guidelines. • Vehicles transporting waste or other materials that may produce odours or dust shall be covered during transportation. • Should wind and climatic conditions be such that dust cannot be controlled, and control strategies are not possible, then dust generating work would cease. • Implement work practices as per the Interim Construction Noise Guidelines (DEEC 2009).

9.2 Biodiversity impacts

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. affect any declared area of outstanding biodiversity value or critical habitat or environmental asset of intergenerational significance?	No	N/A	N/A	N/A
2. result in the clearing or modification of	Yes	Low (negative)	The proposal is expected to have a low impact on the vegetation of the Proposal	• Trees to be retained will require an adequate Tree Protection Zone (TPZ) for the duration of the works, with

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
vegetation, including ecological communities and plant community types of conservation significance?			Area, with approximately 2.94 hectares of native vegetation to be impacted. This includes 2.48ha hectares of PCT 3387 Central West Creekflat Grassy Woodland (BC and EPBC Act Listed TEC) and 0.46 hectares of PCT 3747: Southern Tableland Western Hills Scribbly Gum Forest. However, further refinement of the plans will allow for a greater retention of vegetation. A Test of Significance has been undertaken for PCT 3387 in **Appendix B**.	details for calculating TPZs provided within Australian Standard 4970-2009 – Protection of trees on development sites. • If the TPZ cannot be avoided during works, the Structural Root Zones (SRZ) of trees will be retained, with details for calculating the SRZs also provided within Australian Standard 4970-2009 – Protection of trees on development sites. • Pruning is to be selected for trees overhanging the track for vehicle access over complete tree removal where possible. • No go zones will be created prior to works to protect habitat and sensitive areas and these will be monitored throughout construction to prevent impacts. • Site induction and toolbox talks for ecologically sensitive areas will be undertaken.
3. endanger, displace, or disturb terrestrial or aquatic fauna, including fauna of conservation significance, or create a barrier to their movement?	Yes	Low (negative)	The proposed works have a negligible potential to impact upon fauna habitat. The impacts associated with the works are along a track (Long Swamp Road) and flume. It is possible that the removal of this vegetation may result in minor impacts to suboptimal foraging habitat, however it will not impact on connectivity or create a barrier to movement. Breeding habitat, such as hollow-bearing trees, coarse woody debris, and burrows, were observed within the Proposal Area during the site assessment. However, refined design of the plans for the Proposal Area can allow for the retention of breeding habitat features where possible.	• Site inductions to include a briefing regarding the local fauna of the Proposal Area and identification of protocols to be undertaken if fauna is encountered. • Prior to construction, the Proponent must commission the services of a qualified and experienced Ecologist with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. The Ecologist will be commissioned to Undertake an extensive pre-clearing survey; delineating habitat-bearing trees/shrubs and threatened flora to be retained and protected. • Avoid the removal or disturbance of shelter/denning habitat such as woody debris, fallen logs, burrows in the ground, dense shrubs, rock crevices and bush rocks during construction. Any fallen timber and dead wood encountered within the development footprint will be left in situ wherever possible or implement procedures for the relocation of habitat features to adjacent areas for habitat enhancement.

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
4. result in the removal of protected flora or plants or fungi of conservation significance?	No	Negligible (negative)	No threatened flora species were identified at the time of the site assessment and are not expected to be impacted by the proposed works.	• Prior to construction, the Proponent must commission the services of a qualified and experienced Ecologist with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act
6. contribute to a key threatening process to biodiversity or ecological integrity?	Yes	Negligible (negative)	The proposal will contribute to key threatening process (KTP), as listed in the BC Act, clearing of native vegetation, however, contribution of the proposal to this KTP is low considering the large area of high-quality connected bushland that will continue to occur within the locality.	• This REF document and consultation with Ecologists will allow for fine-scale planning to avoid and minimise ecological impacts. • Prior to construction, the Proponent will undertake pre-works surveys in consultation with the Ecological Site Assessment completed in this REF. • No go zones will be created prior to works to protect habitat and sensitive areas and these will be monitored throughout construction to prevent impacts
7. introduce weeds, pathogens, pest animals or genetically modified organisms into an area?	Yes	Low (negative)	The Proposal has the potential to introduce weeds and pathogens into the area during construction works primarily from the importation of plant, equipment, and materials. Some weeds will be removed through the track upgrades and the replacement of the existing flume.	Weed and Pathogen Management requirements must be implemented for the proposal. This would include: • Management protocol for declared priority weeds under the Biosecurity Act 2015 during and after construction. • Weed hygiene protocol in managing the clean importation of plant, equipment, and fill. • Any occurrences of pathogens such as Myrtle Rust and Phytophthora would be monitored, treated, and reported. • During construction only- No vehicles to travel in vegetation outside the track during their time on site. Inspect vehicles for mud and vegetation matter upon entering site. Vehicles to be washed before coming to site and then exclusively work within the Proposal Area. • The Weed and Pathogen Management procedure will be incorporated as part of the CEMP to be completed prior to construction.

9.3 Community impacts

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. affect community services or infrastructure?	No	N/A	N/A	N/A
2. affect sites important to the local or broader community for their recreational or other values or access to these sites?	No	N/A	N/A	N/A
3. affect economic factors, including employment, industry, and property value?	Yes	Low (positive)	The construction activity itself will provide employment for the local community through employment of local contractors.	Source local contractors and supply of materials, where possible.
4. have an impact on the safety of the community?	Yes	Low (negative)	Although Long Swamp Rd is locked and its use is restricted, two private landholders utilise Long Swamp Road for access.	A CEMP is required prior to the start of works and landholders will be notified in advance. Appropriate signage will be put in place on the road. Daily toolbox talks will re-assess site safety plans.
5. cause a bushfire risk?	Yes	Low (negative)	The proposal will see a low increase to bushfire risk during construction activities. Use of machinery with hot exhausts or any activities likely to emit sparks may be a fire hazard.	• No smoking is permitted within any area of the parks. • Contractors will be required to have an emergency evacuation plan including a fire prevention plan and reporting procedures as part of CEMP. • No mechanical works involving the use of welding equipment, machinery with hot exhausts or any activities likely to emit sparks, would be undertaken during total fire bans. Under the project risk register and CEMP, controls will be put in place to manage the risk of bushfire.
6. affect the visual or scenic landscape?	Yes	Low (negative)	The Proposal is largely restricted to the existing footprint flume and Long Swamp Road. However, the removal of vegetation is required to provide access for construction vehicles.	• Ground disturbance and vegetation clearing must be limited to the minimum required to allow for safe construction vehicle access.

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
			During construction works, machinery and equipment would be visible to the public, however this would be temporary and minor, given the remote location of the Proposal Area. Temporary signage may be erected to provide information about works prior to and during construction works.	• Where possible, materials used for construction would be chosen to blend in with the surrounding natural landscape or existing track. • Construction equipment, machinery and materials would be stored at nominated sites, away from any native vegetation to be retained. • Native vegetation cleared will either be mulched and reused on site or salvaged and reinstated to cover track edges and bare ground where possible. • Where possible, vegetation clearing will be undertaken using low impact techniques such as hand tools to ensure over-clearing and unrequired disturbance is not undertaken.

9.4 Natural resource impacts

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. result in the degradation of the park or any other area reserved for conservation purposes?	Yes	Low (negative)	The proposal is expected to have a low impact on the park and the values of the land subject to the conservation agreement.	• See safeguards in Table 1 and in section 9.2. The extent of clearing and ground disturbance will be minimised.
2. affect the use of, or the community's ability to use, natural resources?	Yes	Negligible (negative)	Use of large rock from a local quarry	The volume of hard rock required is not large, and so would not affect the public's access to the rock provided by the quarry.
3. involve the use, wastage, destruction, or depletion of natural resources including water, fuels, timber, or extractive materials? ^	Yes	Negligible (negative)	All materials to be utilised for the proposed works have been selected to be neutral to the naturally occurring landscapes.	• Structured planning to ensure only the quantity of materials required for the proposal will be undertaken to ensure minimal to no wastage. • Any vegetation cleared would either be mulched and reused on site or salvaged and reinstated outside of the Proposal Area.

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
4. provide for the sustainable and efficient use of water and energy? †	No	N/A	N/A	N/A

9.5 Aboriginal cultural heritage impacts

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. disturb the ground surface or any vegetation likely to contain culturally modified trees?	Yes	Low - negative	Earthworks will be involved in replacing the flume and the roadworks on Long Swamp Road. Some vegetation clearing will also be required.	• See below.
2. affect or occur near known Aboriginal objects, Aboriginal places, or an Aboriginal cultural asset of intergenerational significance? If so, can impacts be avoided? How?	Yes	Low - negative	[redacted] Avoiding any soil disturbance (such as track widening or realignment) within these areas would reduce impacts to the sites; however, vehicle access will still be required on the existing road, which will impact the sites. Hence, impacts cannot be avoided.	• An Aboriginal Cultural Heritage Assessment Report and Aboriginal Heritage Impact Permit will be required prior to commencing any works, including vehicle access, within the identified Aboriginal site areas. • No soil disturbance, including track widening or realignment, should occur within the site areas defined in Figure 5 to preserve identified Aboriginal sites (Tarlo River National Park TRNP-AFT01, TRNP-AFT02, and TRNP-PAD01). • Mitigation of impacts to these sites must be included in the Aboriginal Heritage Impact Permit (AHIP) if avoidance of disturbance is not achievable.
3. affect areas: • within 200 m of waters • within a sand dune system	Yes	Low (negative)	The Proposed Area is situated within 200 metres of several watercourses. Specifically: • Long Swamp Road typically runs within 50 metres of a 3rd/4th order watercourse, namely Junction Creek.	• Minimise ground disturbance through construction management practices, such as utilising existing tracks or employing non-invasive techniques. • Acknowledge that elevated areas adjacent to watercourses may be archaeologically sensitive.

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
• on a ridge top, ridge line or headland • within 200 m below or above a cliff face • in or within 20 m of a cave, rock shelter or a cave mouth? If so, can impacts be avoided? How?			• The Flume is positioned within Junction Creek. • The quarry site is located within 100 metres of two first-order non-perennial creeks. It is recognised that the majority of the banks and terraces of Junction Creek have been previously disturbed by the construction of flumes and water management bunds, potentially impacting the integrity of subsurface deposits in these areas. The anticipated impacts are expected to be isolated in nature and will not substantially affect a large area.	• If widening or realignment of Long Swamp Road becomes necessary, it should occur on the eastern side of the current trail, further away from Junction Creek and its associated landforms. • If relocation to the eastern side is not feasible, impacts must be mitigated under the AHIP.
4. affect wild resources which are used or valued by the Aboriginal community or affect access to these resources?	No	N/A	N/A	N/A
5. affect access to culturally important locations?	No	N/A	N/A	N/A

9.6 Other cultural heritage impacts

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. affect or occur near places, buildings, or landscapes of heritage significance? ^	Yes	Low (negative)	Tarlo River National Park is listed as an item under the Upper Lachlan Shire LEP. Tarlo River National Park is valued as a scientific, educational, and scenic resource within an extensively cleared pastoral district. Consultation with Upper Lachlan Shire Council has confirmed there are no concerns in terms of	• Ensure any activity in the vicinity follows strict guidelines to minimise disturbance to heritage sites should any be discovered. • Implement measures to protect the integrity and significance of heritage structures and landscapes, should any be discovered.

Is the Proposed Activity likely to…	Applies?	Impact level	Reasons	Safeguards/mitigation measures
			the potential for impacts to the local heritage significance of Tarlo River National Park.	
2. impact on relics or moveable heritage items, or an area with a high likelihood of containing relics?	No	N/A	N/A	N/A
3. impact on vegetation of cultural landscape value (e.g. gardens and settings, introduced exotic species, or evidence of broader remnant land uses)?	No	N/A	N/A	N/A

9.7 Impacts on matters of national environmental significance

Is the proposal likely to affect MNES, including:	Applies?	Likely impact	Reasons	Safeguards/mitigation measures
1. listed threatened species or ecological communities)?	Yes	Low (negative)	The proposal is expected to have a low impact on the vegetation of the Proposal Area, with approximately 2.48ha hectares of PCT 3387 Central West Creekflat Grassy Woodland (EPBC Act Listed TEC). However, further refinement of the plans will allow for a greater retention of vegetation. A Test of Significance under the EPBC Act has been undertaken for PCT 3387 in **Appendix B**.	Prior to construction, the principal contractor must commission the services of a qualified and experienced Ecologist. The Ecologist must be licensed with a current Animal Research Authority permit and Scientific Licence issued under the BC Act. The Ecologist will be commissioned to undertake an extensive pre-clearing survey to confirm the absence of threatened species and habitat.
2. listed migratory species?	Yes	Negligible (negative)	No EPBC Act listed migratory species were identified within the Proposal Area. However, these species have the potential to utilise habitat	See above.

Is the proposal likely to affect MNES, including:	Applies?	Likely impact	Reasons	Safeguards/mitigation measures
			within the Proposal Area (e.g., foraging or passage) during part of their life cycles. The Proposal will have low impacts on potential foraging habitat and negligible impacts on potential breeding habitat for these species.	
3. the ecology of Ramsar wetlands?	No	N/A	N/A	N/A
4. world heritage values of World Heritage properties?	No	N/A	N/A	N/A
5. the national heritage values of national heritage places?	No	N/A	N/A	N/A

9.8 Cumulative impacts

No other projects have been approved, are in construction or are being proposed in the vicinity of the proposal covered by this REF.

10. Proposals needing more information

10.1 Lease or licence proposals under s 151 National Parks and Wildlife Act

The Proposed Activity does not require lease or licence proposals under s 151 National Parks and Wildlife Act.

10.2 Telecommunications facilities

10.2.1 Consideration of s 153D National Parks and Wildlife Act

No telecommunications facilities are nominated by the Proposed Activity.

10.2.2Provision and maintenance of an asset protection zone

No telecommunications facilities are nominated by the Proposed Activity.

10.3 Activities within regulated catchments

The Proposed Activity occurs within a regulated catchment that is subject to the provisions of Chapter 6 of the Biodiversity and Conservation SEPP, namely the Sydney Drinking Water Catchment.

Hence, under s.171A of the EP&A Regulation, the REF must consider the matters listed in Table 6 and Table 7.

Table 6. Matters for all regulated catchments

Factors	Response
1. Water quality and quantity	
a. will the proposal have a neutral or beneficial effect on the quality of water entering a waterway?	Once completed, the proposal will have a beneficial effect on water quality by addressing bed lowering in Junction Creek and sediment and nutrient from entering Sydney's drinking water.
b. will the proposal have an adverse impact on water flow in a natural waterbody?	No
c. will the proposal increase the amount of stormwater runoff from a site?	No
d. will the proposal incorporate on-site stormwater retention, infiltration or reuse?	No
e. what is the impact of the proposal on the level and quality of the water table?	No long-term impact
f. what will be the cumulative environmental impact of the proposal on the regulated catchment?	Long term improvement

Factors	Response
g. does the proposal make adequate provision to protect the quality and quantity of ground water?	Yes – water quality risks during construction will be managed by a CEMP. Water quality will be improved by the proposal once completed.
2. Aquatic ecology	
a. will the proposal have a direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation? How?	The proposal will have a direct short-term impact on terrestrial and aquatic ecology through the initial disturbance to the bed of Junction Creek to remove the old concrete flume and replace with a rock flume. Minor vegetation removal will be required for the flume itself and the upgrade of Long Swamp Road. Both impacts will be to the minimum extent necessary and will facilitate the longer-term improvement of terrestrial and aquatic biodiversity by stabilising the bed of Junction Creek and preventing further bed lowering.
b. does the proposal involve the clearing of riparian vegetation?	The proposal does require minor clearing of riparian vegetation. Fisheries have been consulted and replied with no objections providing that environmental safeguards such as sediment fences are installed, and any material removed from the waterway is deposited or stockpiled well away from the waterway and contained.
c. will the proposal minimise or avoid the erosion of land abutting a natural waterbody and/or the sedimentation of a natural waterbody?	Completed works will prevent further bed lowering of Junction Creek and decrease sediment and nutrient entering Sydney's drinking water.
d. will the proposal have an adverse impact on wetlands (not including those in mapped coastal wetlands and littoral rainforests areas)?	Not Applicable.
e. does the proposal include adequate safeguards and rehabilitation measures to protect aquatic ecology?	The proposed works will be carried out according to the procedures documented in a CEMP. This includes implementing appropriate surface water management measures to minimise impacts, as well as preparing an erosion and sedimentation plan. Erosion and sediment controls will be designed in accordance with the Blue Book. Erosion and sediment control measures will be implemented before construction at any stockpiles or work areas to avoid impacts to waterways via stormwater runoff. Sediment fencing will be installed where works are occurring in close proximity to watercourses. Soil exposure will be limited in time, and disturbed soils will be revegetated immediately after construction ceases in those areas.
f. if the development site adjoins a natural waterbody, are additional measures required to ensure a neutral or beneficial effect on the water quality of the waterbody?	Not Applicable.

Factors	Response
3. Flooding	
What is the likely impact of the proposal on periodic flooding that benefits wetlands and other riverine ecosystems?	Not Applicable.
4. Recreation and public access	Note. does not apply to the Sydney Drinking Water catchment
a. what is the likely impact of the proposal on recreational land uses?	Not Applicable.
b. will the proposal maintain or improve public access to and around foreshores without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation?	Not Applicable.

Table 7. NorBE assessment for Sydney Drinking Water Catchment

NorBE assessment questions	Response
1. Are there any identifiable potential impacts on water quality? 2. What pollutants are likely? 3. At what stage do the impacts occur?	Potential impacts include increased sediment and nutrient during construction and oil/fuel spills during construction. Longer term impacts on water quality will be positive.
4. For each pollutant, what are the safeguards needed to prevent or mitigate potential impacts on water quality?	Sediment and nutrient: Undertaking works in accordance with a documented in a CEMP, which includes implementing appropriate surface water management measures to minimise impacts, as well as preparing an erosion and sedimentation plan. Erosion and sediment controls will be designed in accordance with the Blue Book. Erosion and sediment control measures will be implemented before construction at any stockpiles or work areas to avoid impacts to waterways via stormwater runoff. Sediment fencing will be installed where works are occurring in close proximity to watercourses. Soil exposure will be limited in time, and disturbed soils will be revegetated immediately after construction ceases in those areas. Oil and Fuel: Refuelling will be undertaken on flat, clear surfaces 40m away from tributaries and drains. Plant and vehicles must not be cleaned or washed down on-site. Such activity must be undertaken in a suitable location outside of the Proposal Area or parks. Pre-start vehicle checks should be conducted at the beginning of each day during construction works and any leaking fuel or fluid tanks must be repaired before access to Proposal Area.
5. Will the safeguards be adequate for the time required? 6. How will they need to be maintained?	Yes – regular monitoring and maintenance will be undertaken on sediment and nutrient controls. Regular tool box talks will ensure all personnel on site are following procedures as per the CEMP and Sediment and nutrient control plans.

NorBE assessment questions	Response
7. Will all impacts on water quality be effectively contained on the site by the identified safeguards (above) and not reach any watercourse, waterbody or drainage depression? 8. Or will impacts on water quality be transferred outside the site for treatment? How? Why?	Environmental safeguards (e.g. sediment fences, etc.) will be installed consistent with "Managing Urban Stormwater: Soils and Construction" (4th Edition Landcom, 2004, aka the Blue to ensure that there is no escape of turbid plumes into the adjacent aquatic environment; Re-fuelling will be undertaken in designated areas away from watercourses. Excess soil material will be stockpiled away from watercourses in the disused quarry on Towrang Road and appropriate sediment and nutrient controls will be implemented.
9. Is it likely that a neutral or beneficial effect on water quality will occur? Justify	Completed works will prevent further bed lowering of Junction Creek and decrease sediment and nutrient entering Sydney's drinking water.

10.4 Activities in River Murray riverine land

The Proposed Activity will not occur in any lands on the land application map of Chapter 5 of the Biodiversity and Conservation SEPP.

11. Summary of impacts and conclusions

Environmental factor	Consideration	Significance of impact*
(a) the environmental impact on the community	Social, economic, and cultural impacts as described in sections 9.3, 9.5 and 9.6	Not significant
(b) the transformation of the locality	Human and non-human environment as described in sections 9.1, 9.2 and 9.4	Not significant
(c) the environmental impact on the ecosystems of the locality	Amount of clearing, loss of ecological integrity, habitat connectivity/ fragmentation and changes to hydrology (both surface and groundwater) as described in sections 9.1, 9.2 and 9.4 and, for nationally listed threatened ecological communities, in section 9.7.	Not significant
(d) reduction of the aesthetic, recreational, scientific, or other environmental quality or value of the locality	Visual, recreational, scientific, and other impacts as described in section 9.3.	Not significant
(e) the effects on any locality, place or building that has— (I) aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific, or social significance, or (ii) other special value for present or future generations	Impacts to Aboriginal and historic heritage associated with a locality (including intangible cultural significance), architectural heritage, social/community values and identity, scenic values, and others, as described in sections 9.3, 9.5 and 9.6 and (for MNES heritage places) section 9.7.	Not significant
(f) the impact on the habitat of protected animals, within the meaning of the Biodiversity Conservation Act	Impacts to all native terrestrial species, including but not limited to threatened species, and their habitat requirements, as described in section 9.2.	Not significant
(g) the endangering of a species of animal, plant, or other form of life, whether living on land, in water or in the air	Impacts to all listed terrestrial and aquatic species, and whether the proposal increases the impact of key threatening processes, as described in section 9.2	Not significant
(h) long-term effects on the environment	Long-term residual impacts to ecological, social, and economic values as described in all parts of section 9.	Not significant
(i) degradation of the quality of the environment	Ongoing residual impacts to ecological, social, and economic as described in section 9.4.	Not significant
(j) risk to the safety of the environment	Impacts to public and work health and safety, from contamination, bushfires, sea level rise, flood, storm surge, wind speeds, extreme heat, rockfall and landslip, and other risks likely to increase due to climate change as described in sections 9.1, 9.3 and 9.4.	Not significant
(k) reduction in the range of beneficial uses of the environment	Impacts to natural resources, community resources and existing uses as described in sections 9.3 and 9.4.	Not significant

Environmental factor	Consideration	Significance of impact*
(l) pollution of the environment	Impacts due to air pollution (including odours and greenhouse gases); water pollution (water quality health); soil contamination; noise and vibration (including consideration of sensitive receptors); or light pollution, as described in sections 9.1 and 9.3.	Not significant
(m) environmental problems associated with the disposal of waste	Transportation, disposal, and contamination impacts as described in section 9.3.	Not significant
(n) increased demands on natural or other resources that are, or are likely to become, in short supply	Impacts to land, soil, water, gravel, minerals, and energy supply as described in section 9.4.	Not significant
(o) the cumulative environmental effect with other existing or likely future activities	The negative synergisms with existing development or future activities as considered in section 9.8.	Not significant
(p) the impact on coastal processes and coastal hazards, including those under projected climate change conditions	Impacts arising from the Proposed Activity on coastal processes, and impacts on the Proposed Activity from those coastal processes and hazards, both current and future, as considered in section 9.1.	Not significant
(q) applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1	Inconsistency with the objectives, policies and actions identified in local, district and regional plans, as considered in section 3.2.2.	Not significant
(r) other relevant environmental factors.	Any other factors relevant in assessing impacts on the environment to the fullest extent, such as native title implications.	Not significant

In conclusion:

- There **is not** likely to be a significant effect on the environment and an environmental impact statement is not required.

  This conclusion is based on the proposed implementation of comprehensive mitigation strategies and safeguards designed to minimise and manage potential impacts effectively. The detailed impact assessment and the inclusion of specific environmental management plans, such as the Construction Environmental Management Plan (CEMP), Erosion and Sediment Control Plans (ESCP), and pre-construction ecological surveys, further ensure that the project's potential negative impacts are addressed proactively.

- There **is not** likely to be a significant effect on threatened species, populations, ecological communities or their habitats and a species impact statement **is not** required.

  The proposal impacts approximately 2.94 hectares of native vegetation, which includes areas of BC Act and EPBC Act listed Threatened Ecological Communities (TECs). The impact is assessed as low due to the implementation of safeguard measures such as Tree Protection Zones and conducting pre-clearance surveys to minimise effects on flora and fauna. In addition, a Test of Significance was undertaken under the BC Act and EPBC Act and impacts were deemed not significant. Although the proposal contributes to key threatening processes, such as clearing of native vegetation, this

contribution is assessed as low. This is due to the large area of high-quality connected bushland that will continue to exist within the locality, which helps preserve ecological integrity and biodiversity.

- The activity **is not** likely to have a significant impact on matters of national environmental significance listed under the Commonwealth Environment Protection and Biodiversity Conservation Act

  The proposal impacts approximately 2.94 hectares of native vegetation, which includes areas of EPBC Act listed Threatened Ecological Communities (TECs). The impact is assessed as low due to the implementation of safeguard measures such as Tree Protection Zones and conducting pre-clearance surveys to minimise effects on flora and fauna. In addition, a Test of Significance was undertaken under the BC Act and EPBC Act and impacts were deemed not significant. Although the proposal contributes to key threatening processes, such as clearing of native vegetation, this contribution is assessed as low. This is due to the large area of high-quality connected bushland that will continue to exist within the locality, which helps preserve ecological integrity and biodiversity. No other MNES are affected by the Proposed Activity.

- The activity **will** require certification in accordance with the NPWS Construction Assessment Procedures for the applicable parts of the Australian Standard for demolition. Note: there is no Australian Standard for the construction of a flume. Instead, NPWS will request written confirmation from the Soil Conservation Service that works are 'best practise'.

12. Supporting documentation

Document title	Author	Date
1. DOC24/649373 Aboriginal Cultural Values Due Diligence Report	Heritage Now	29/02/2024
2. DOC25/18972 HN733-B Tarlo River ACHAR Draft v3	Heritage Now	10/01/2025
3. DOC24/1067078 Advice from DPIRD Fisheries	DPIRD Fisheries	13/12/2024
4. DOC24/775210 Upper Lachlan Shire Council Signed Agreement	NPWS	20/09/2024
5. DOC24/755352 Signed Landholder Agreement	NPWS	13/09/2024
6. DOC25/97990 Council response to Tarlo NP LEP listing	NPWS	5/02/2025
7. DOC24/649367 Consultation with the BCT regarding VCA00382	NPWS	9/08/2024

13. Fees for external proponents

Not Applicable.

14. Declarations

As the person responsible for the preparation of the REF, I certify that, to the best of my knowledge, this REF is in accordance with the EP&A Act, the EP&A Regs and the Guidelines approved under section 170 of the EP&A Regs, and the information it contains is neither false nor misleading.

Signature	[redacted]
Name (printed)	Brodie Miller
Position	Project Manager/Ecologist
Date	28.02.2024

By endorsing the REF, the proponent confirms that the information in the REF is accurate and adequate to ensure that all potential impacts of the activity can be identified.

Signature	[redacted]
Name (printed)	Andrew Wall
Position	Area Manager – Illawarra Highlands
Date	24/02/2025

Appendix A: Likelihood of Occurrence Tables

Threatened flora (inclusive of fungi)

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further assessment required
Acacia bynoeana (Bynoe's Wattle)	Endangered	Vulnerable	This species is typically found in heath or dry sclerophyll forests, particularly on sandy soils. It tends to favour open areas that are occasionally disturbed, such as trail margins, the edges of roadside spoil mounds, and recently burnt patches. Other species commonly found in the same habitat include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia, and Narrow-leaved Apple. This type of habitat is present within the Proposal Area.	Moderate – the species has potential habitat within the proposal area; however, the species is not cryptic in nature and is not known to form a persistent seedbank. There are no historic records in the Proposal Area.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As such, no impact is anticipated.	No further assessment required.
Dodonaea procumbens (Trailing Hop-Bush)	Vulnerable	Vulnerable	This species grows in Natural Temperate Grassland or fringing eucalypt woodland of Snow Gum (*Eucalyptus pauciflora*). It thrives in open bare patches where there is little competition from other species. It is typically found on sandy-clay soils, usually on or near vertically-tilted shale outcrops. It often occurs on roadside batters. Marginal habitat is present within the Proposal Area.	Low – potential habitat for the species is marginal, the species is not cryptic in nature and is not known to form a persistent seedbank.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As such, no impact is anticipated.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further assessment required
Eucalyptus aggregata (Black Gum)	Vulnerable	Vulnerable	This species has a moderately narrow distribution, primarily occurring in the wetter, cooler, and higher parts of the tablelands. It tends to grow in the lowest parts of the landscape, particularly on alluvial soils. It thrives in cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Marginal habitat is present within the Proposal Area.	Low – potential habitat for the species is marginal, the species is not known to form a persistent seedbank. Known populations are sparse and highly fragmented.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As such, no impact is anticipated.	No further assessment required.
Galium australe (Tangled Bedstraw)	Endangered	Not Listed	In NSW this species has been recorded in Turpentine forests and coastal Acacia shrublands. In other states, the species is found in a range of near-coastal habitats, including sand dunes, sand spits, shrublands, and woodlands. No suitable habitat is present within the Proposal Area.	None – potentially suitable habitat is absent from the study area.	Negligible.	No further assessment required.
Hibbertia acaulothrix	Not listed	Endangered	This species is found on rocky outcrops and has been recorded growing in *Eucalyptus sieberi* woodland or in association with *Allocasuarina littoralis* (black she-oak), *Corymbia gummifera* (red bloodwood), and *Leptospermum trinervium* (flaky-barked tea-tree). No suitable habitat or associated species are present within the Proposal Area.	None – potentially suitable habitat is absent from the study area.	Negligible.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further assessment required
Kunzea cambagei (Cambage Kunzea)	Vulnerable	Vulnerable	This species is restricted to damp, sandy soils in wet heath or mallee open scrub at higher altitudes on sandstone outcrops or Silurian group sediments. No suitable habitat is present within the Proposal Area.	None – potentially suitable habitat is absent from the study area.	Negligible.	No further assessment required.
Lepidium aschersonii (Spiny Peppercress)	Vulnerable	Vulnerable	This species is found on ridges of gilgai clays dominated by Brigalow (*Acacia harpophylla*), Belah (*Casuarina cristata*), Buloke (*Allocasuarina luehmanii*), and Grey Box (*Eucalyptus microcarpa*). In the south, it has been recorded growing in Bull Mallee (*Eucalyptus behriana*). Often, the understorey is dominated by introduced plants. The species grows as a component of the ground flora, in grey loamy clays. The vegetation structure varies from open to dense, with sparse grassy understorey and occasional heavy litter. No suitable habitat or associated species are present within the Proposal Area.	None – potentially suitable habitat is absent from the study area.	Negligible.	No further assessment required.
Lepidium hyssopifolium (Aromatic Peppercress)	Endangered	Endangered	In NSW this species is known to have occurred in both woodland with a grassy understorey and in grassland. It may be a disturbance opportunist, as it was discovered at the most recently discovered site (near Bungendore) following soil disturbance. The cryptic and non-descript nature of the species, appearing like several weed species,	Low – the species has potential habitat within the Proposal Area and is cryptic in nature. However, there are no records within the locality of the Proposal Area.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further assessment required
			makes it hard to detect. Potential habitat could be present in the Proposal Area.		such, no impact is anticipated.	
Leucochrysum albicans subsp. *Tricolor* (Hoary Sunray)	Endangered	Endangered	This species is known to inhabit a diverse range of grassland, woodland, and forest habitats, particularly on heavy soils. It can also be found in altered environments like semi-urban areas and roadsides. Its germination process is highly reliant on the availability of bare ground. Such habitats are present within the Proposal Area.	Low – the species potential habitat within the proposal area is large; however, the species is not cryptic in nature and is not known to form a persistent seedbank.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As such, no impact is anticipated.	No further assessment required.
Pomaderris cotoneaster (Cotoneaster Pomaderris)	Endangered	Endangered	This species is known to inhabit a variety of habitats, primarily in forested areas. These habitats include forests with deep, crumbly soil, areas with rocky outcrops beside creeks, rocky forested slopes, and steep gullies between sandstone cliffs. Marginal habitat is present within the Proposal Area.	Low – the species has marginal potential habitat within the proposal area; however, the species is not cryptic in nature and is not known to form a persistent seedbank.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As such, no impact is anticipated.	No further assessment required.
Pomaderris pallida (Pale Pomaderris)	Vulnerable	Vulnerable	This species grows in shrub communities that are surrounded by Brittle Gum (*Eucalyptus mannifera*) and Red Stringybark (*E. macrorhyncha*) or Callitris spp. woodland. Marginal habitat is present within the Proposal Area.	Low – the species has marginal potential habitat within the proposal area; however, the species is not cryptic in nature and is not known to form a persistent seedbank.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further assessment required
					Activity is minimal. As such, no impact is anticipated.	
Rhizanthella slateri (Eastern Australian Underground Orchid)	Vulnerable	Endangered	The species' habitat requirements are poorly understood, and no particular vegetation type has been associated with it, although it is known to occur in sclerophyll forests. In New South Wales, it is currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, the Wiseman's Ferry area, Agnes Banks, and near Nowra. It is highly cryptic, given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore, it is usually located only when the soil is disturbed. Marginal habitat is present within the Proposal Area.	Low – the species has marginal potential habitat within the proposal area; however, has not been recorded within the locality of the Proposal Area.	Minimal. A targeted survey was undertaken and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As such, no impact is anticipated.	No further assessment required.
Rutidosis leptorhynchoides (Button Wrinklewort)	Endangered	Endangered	The species is typically found in Box-Gum Woodland, secondary grassland that has developed from Box-Gum Woodland, or in Natural Temperate Grassland. It is often located in ecotone between these two ecosystems. It thrives in soils that are typically shallow and stony, with a red-brown clay loam composition. It tends to occupy areas where there is relatively less competition from herbaceous	Low – the species potential habitat is marginal, the species is not cryptic in nature or known to have a persistent seedbank, and the species has not been recorded in the locality.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As such, no impact is anticipated.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further assessment required
			species, which may be due to the shallow nature of the soil or, in some instances, to the competitive influence of woodland trees. Marginal habitats are present within the Proposal Area.			
Thesium australe (Austral Toadflax)	Vulnerable	Vulnerable	This species is known to inhabit grassland areas and is considered a root parasite, drawing water and some nutrients from other plants, particularly Kangaroo Grass. Such habitats are present within the Proposal Area.	Moderate – potential habitat is present within the Proposal Area; however, Kangaroo Grass was not dominant in the Proposal Area nor has the species been recorded in the locality.	Minimal. A targeted survey was undertaken during the DPE endorsed survey period and no individuals were identified within the Proposal Area. Vegetation clearing as a result of the Proposed Activity is minimal. As such, no impact is anticipated.	No further assessment required.

Threatened fauna (inclusive of invertebrates)

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
Anthochaera phrygia (Regent Honeyeater)	Critically Endangered	Critically Endangered	This species is a generalist forager, although it primarily feeds on the nectar of a relatively small number of eucalypt species that produce high volumes of nectar. This species breeds in Box-Ironbark and other temperate woodlands, as well as riparian gallery forests dominated by River Sheoak.	Low – species has not been recorded within the locality of the Proposal Area; Proposal Area does not contain mapped Important Areas for this species.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species. The	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			Potential foraging habitat for this species was identified within the Proposal Area. No breeding habitat occurs within the Proposal Area.		Proposal Area does not contain mapped Important Areas for this species (DPE 2024). The species is mobile in nature.	
Aphelocephala leucopsis (Southern Whiteface)	Vulnerable	Vulnerable	This species is known to inhabit open woodlands ranging from near-arid habitats, such as Acacia scrub and hummock grassland, to the wetter grassy woodlands of southeastern Australia where Eucalypts dominate. The species constructs a large, untidy domed nest made of grass, bark, and roots. These nests are commonly found on tree stumps, hollow limbs, fence posts, foliage of shrubs and low trees, or sheds. No nests were identified within the Proposal Area during December 2023 surveys. Potential foraging habitat is present within the Proposal area.	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species. The species is mobile in nature.	No further assessment required.
Aprasia parapulchella (Pink-tailed Worm-lizard)	Vulnerable	Vulnerable	This species is known to inhabit sloping, open woodland areas characterised by predominantly native grassy ground layers and well-drained soils, often with rocky outcrops or scattered, partially-buried rocks. It feeds on the larvae and eggs of ants with which it shares its burrows. It is	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified. No records of species in the locality of the Proposal Area.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			commonly found beneath small, partially-embedded rocks and appear to spend a considerable amount of time in burrows below these rocks. The burrows are typically constructed by and are often still inhabited by small black ants and termites. Potential foraging habitat is present surrounding the proposal area. No burrows of a suitable size were identified in the Proposal Area during December 2023 surveys.		December 2023 did not detect this species.	
Artamus cyanopterus cyanopterus (Dusky Woodswallow)	Vulnerable	Not Listed	This species primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations. These areas typically have an open or sparse understorey of eucalypt saplings, acacias, and other shrubs, as well as ground cover consisting of grasses, sedges, and fallen woody debris. The species primarily feeds on invertebrates, particularly insects. It nests in trees, constructing an open, cup-shaped nest made of twigs, grass, fibrous rootlets, and occasionally casuarina needles. No nests were identified within the Proposal Area during December 2023 surveys. Potential foraging habitat is	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species. The species is mobile in nature.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			present within the Proposal area.			
Botaurus poiciloptilus (Australasian Bittern)	Endangered	Endangered	This species prefers permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes and spikerushes. During the day, it hides among dense reeds or rushes and feeds mainly at night on a diet that includes frogs, fish, yabbies, spiders, insects, and snails. Breeding occurs in summer, from October to January. Nests are typically built in secluded places within densely-vegetated wetlands, on a platform of reeds. Clutches usually consist of six olive-brown eggs. No nests were identified within the Proposal Area during November 2023 surveys. No potential foraging habitat is present within the Proposal area.	None – no potential breeding or foraging habitat identified within the Proposal Area.	No impact to foraging habitat or breeding habitat is expected as no appropriate habitat is within the Proposal Area.	No further assessment required.
Calidris ferruginea (Curlew Sandpiper)	Endangered	Critically Endangered	The bird primarily inhabits coastal areas, especially mudflats along sheltered coasts in New South Wales. It can also be found in non-tidal swamps, lakes, and lagoons, both near the coast and occasionally further inland. The bird feeds in shallow water or at the water's edge, and sometimes on algal mats, waterweed, or beach-cast	None – no potential breeding or foraging habitat identified within the Proposal Area.	No impact to foraging habitat or breeding habitat is expected as no appropriate habitat is within the Proposal Area.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			seagrass or seaweed. It roosts on beaches, spits, or islets along the coast or in wetlands, and occasionally in salt marshes, among beach-cast seaweed, or on rocky shores. It is omnivorous, consuming a diet that includes worms, molluscs, crustaceans, insects, and some seeds. No potential breeding or foraging habitat is present within the Proposal area.			
Callocephalon fimbriatum (Gang-gang Cockatoo)	Vulnerable	Endangered	During spring and summer, this species is typically found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. However, in autumn and winter, the species often moves to lower altitudes, favouring drier, more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages. It may also be found in dry forests in coastal areas and urban areas. The species prefers old-growth forest and woodland attributes for nesting and roosting. Nests are typically located in hollows that are 10 cm in diameter or larger in eucalypts. Potential foraging habitat is present in the	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging or breeding habitat as only small areas require clearing. Large areas of habitat will continue to exist in the locality. Hollow-bearing trees will be retained and protected where practical. A suitably qualified ecologist will conduct pre-clearance surveys and supervise clearing works.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			Proposal Area. No hollows of a suitable size identified during December 2023 surveys.			
Calyptorhynchus lathami (Glossy-black Cockatoo)	Vulnerable	Not Listed	This species is typically found in open forests and woodlands along the coast and the Great Dividing Range, where stands of Sheoak occur. Important food sources for this species include Black Sheoak (Allocasuarina littoralis) and Forest Sheoak (A. torulosa). This species feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with its massive bill. For nesting, the species is highly dependent on large hollow-bearing eucalypts. However, no Allocasuarina were identified in the Proposal Area for this species, and no hollows of a suitable size were detected in the proposal area.	Low – very marginal foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging or breeding habitat as only small areas require clearing. Large areas of habitat will continue to exist in the locality. Hollow-bearing trees will be retained and protected where practical. A suitably qualified ecologist will conduct pre-clearance surveys and supervise clearing works.	No further assessment required.
Chalinolobus dwyeri (Large-eared Pied Bat)	Vulnerable	Vulnerable	This species is typically found in well-timbered areas that contain gullies. It likely forages for small, flying insects below the forest canopy. Potential breeding habitat for this species includes rocky areas containing caves, overhangs or crevices, cliffs or escarpments, and old mines,	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			tunnels, culverts, and derelict concrete buildings. Marginal foraging habitat was identified in the Proposal Area, no potential breeding habitat exists within the Proposal Area.			
Climacteris picumnus victoriae (Brown Treecreeper)	Vulnerable	Not Listed	This species is typically found in eucalypt woodlands, including Box-Gum Woodland, and dry open forests of the inland slopes and plains inland of the Great Dividing Range. Their diet mainly consists of insects, but they have also been observed foraging on invertebrates, nectar, and sap. Hollows in standing dead or live trees and tree stumps are essential for nesting. Potential foraging and breeding habitat for this species was identified within the Proposal Area.	Moderate - Potential foraging and breeding habitat for this species was identified within the Proposal Area. Species has been recorded in Proposal Area however last record dates from 1997 (BioNet 2023). The species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging or breeding habitat as only small areas require clearing. Large areas of habitat will continue to exist in the locality. Hollow-bearing trees will be retained and protected where practical. A suitably qualified ecologist will conduct pre-clearance surveys and supervise clearing works. The species is mobile in nature.	No further assessment required.
Dasyurus maculatus (Spotted-tailed Quoll)	Vulnerable	Endangered	This species is a generalist predator with a preference for medium-sized mammals weighing between 500g and 5kg. It consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles, and insects. For den sites, this species uses hollow-bearing trees, fallen logs, small caves, rock outcrops, and rocky-cliff	Moderate - Potential foraging and breeding habitat for this species was identified within the Proposal Area.	Minimal impact to potential foraging and habitat as prey items will persist post-construction. Large areas of habitat will continue to exist in the locality. Hollow-bearing trees will be retained and protected where practical. A suitably qualified ecologist will conduct pre-clearance surveys and supervise clearing works.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			faces. Potential foraging and breeding habitat for this species was identified within the Proposal Area			
Delma impar (Striped Legless Lizard)	Vulnerable	Vulnerable	This species typically inhabits grasslands that are dominated by perennial, tussock-forming grasses such as Kangaroo Grass, spear-grasses, and poa tussocks, with occasional sightings in modified grasslands that have a significant content of exotic grasses or with significant amounts of surface rocks. It actively hunts for spiders, crickets, moth larvae, and cockroaches. During winter, it goes below ground or under rocks or logs for shelter. Sometimes, it uses dried cowpats for shelter. Potential habitat is present within the Proposal Area.	Moderate – potential habitat is present however no records of the species within the locality of the Proposal Area. Grass tussocks in Proposal Area were not dense.	Minimal impact to foraging habitat and minimal anticipated impact to breeding habitat, due to the small scale of the development and the remaining habitat present across the wider Subject Property.	No further assessment required.
Falco hypoleucos (Grey Falcon)	Vulnerable	Vulnerable	This species is widely but sparsely distributed in New South Wales, mainly occurring in inland regions. Potential foraging habitat was identified surrounding the Proposal Area. This species uses old stick nests, typically in the top of an emergent live or sometimes dead tree in woodland, often in riparian areas. No nests were	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging or habitat as only small areas require clearing. Large areas of habitat will continue to exist in the locality. The species is mobile in nature.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			identified within the Proposal Area during December 2023 surveys. Potential foraging habitat is present within the Proposal area.			
Grantiella picta (Painted Honeyeater)	Vulnerable	Vulnerable	This species is a specialist feeder on the fruits of mistletoes that grow on woodland eucalypts and acacias, with a preference for mistletoes of the genus Amyema. It nests from spring to autumn, constructing a small and delicate nest that hangs within the outer canopy of drooping eucalypts, she-oak, paperbark, or mistletoe branches. No nests were identified within the Proposal Area during December 2023 surveys. Potential foraging habitat is present within the Proposal area.	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging or habitat as only small areas require clearing. Large areas of habitat will continue to exist in the locality. The species is mobile in nature.	No further assessment required.
Haliaeetus leucogaster (White-bellied Sea-Eagle)	Vulnerable	Not Listed	This species is typically found in habitats characterised by the presence of large areas of open water, including larger rivers, swamps, lakes, and the sea. It occurs at sites near the sea or seashore, such as around bays and inlets, beaches, reefs, lagoons, estuaries, and mangroves, as well as at or in the vicinity of freshwater swamps, lakes, reservoirs,	None – no potential breeding or foraging habitat identified within the Proposal Area.	No impact to foraging habitat or breeding habitat is expected as no appropriate habitat is within the Proposal Area.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			billabongs, and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grasslands, heathlands, woodlands, and forests, including rainforests. Breeding habitat for this species consists of mature tall open forests, open forests, tall woodlands, and swamp sclerophyll forests close to foraging habitat. Nests are large structures built from sticks and lined with leaves or grass. No nests were identified within the Proposal Area during December 2023 surveys. No potential foraging habitat is present within the Proposal area.			
Hirundapus caudacutus (White-throated Needletail)	Not listed	Vulnerable	The bird is migratory and typically seen in eastern Australia from October to April. It breeds in forests in southeastern Siberia, Mongolia, the Korean Peninsula, and northern Japan from June to August. It is most often seen in eastern Australia before storms, low-pressure troughs, and approaching cold fronts, and occasionally during bushfires. These conditions often cause insects to swarm (e.g., termites and ants) or be lifted away from the surface, favoring sightings of White-	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species. The species is mobile in nature.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			throated Needletails as they feed. Potential foraging habitat present within the Proposal Area; no potential breeding habitat present within Proposal Area.			
Lathamus discolor (Swift Parrot)	Endangered	Critically Endangered	On the mainland, this species occurs in areas where eucalypts are flowering profusely or where there are abundant lerp infestations (from sap-sucking bugs). Potential foraging habitat for this species is present within the Proposal Area. However, no areas of mapped Important Habitat for this species were located within the Proposal Area.	Low – species has not been recorded within the locality of the Proposal Area; Proposal Area does not contain mapped Important Areas for this species.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species. The Proposal Area does not contain mapped Important Areas for this species (DPE 2024). The species is mobile in nature.	No further assessment required.
Litoria booroolongensis (Booroolong Frog)	Endangered	Endangered	Found in habitats along permanent streams, often with some vegetation cover such as ferns, sedges, or grasses. Adults are commonly found on or near cobble banks and other rock structures within stream margins. They often seek shelter under rocks or amidst nearby ground-level vegetation. During summer, they may occasionally bask in the sun on exposed rocks near flowing water.	None – whilst tadpoles were identified in soaks within the Proposal Area, the Proposal Area did not contain permanent streams or sufficient vegetation cover.	No impact to foraging habitat or breeding habitat is expected as no appropriate habitat is within the Proposal Area.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			Breeding typically occurs in spring and early summer, and tadpoles undergo metamorphosis from late summer to early autumn. Eggs are laid in submerged rock crevices, and tadpoles grow in slow-flowing connected or isolated pools. No suitable habitat identified within Proposal Area.			
Melanodryas cucullata cucullata (South-eastern Hooded Robin)	Endangered	Endangered	The species prefers lightly wooded country, typically open eucalypt woodland, acacia scrub, and mallee, often in or near clearings or open areas. It requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs, and a ground layer of moderately tall native grasses. often seen perching on low dead stumps, fallen timber, or low-hanging branches, using a perch-and-pounce method of hunting insect prey. The nest is a small, neat cup made of bark and grasses bound with webs, usually located in a tree fork or crevice, ranging from less than 1 metre to 5 metres above the ground. Potential foraging habitat is present within the Proposal Area however no nests	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging or breeding habitat as only small areas require clearing. Large areas of habitat will continue to exist in the locality. The species is mobile in nature.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			were identified during December 2023 surveys.			
Ninox strenua (Powerful Owl)	Vulnerable	Not listed	Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. It requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine (Syncarpia glomulifera), Black She-oak (Allocasuarina littoralis), Blackwood (Acacia melanoxylon), Rough-barked Apple (Angophora floribunda), Cherry Ballart (Exocarpus cupressiformis), and a number of eucalypt species. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum, and Sugar Glider. There may be marked regional differences in the prey taken by Powerful Owls. Flying-foxes are important prey in some areas; birds comprise about 10-50% of the diet depending on the availability of preferred	Low – only marginal foraging habitat present; no associated tree species within Proposal Area. Potential prey items within Proposal Area. No breeding habitat identified.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species. The species is mobile in nature.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			mammals. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. They nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. Marginal foraging habitat present within the Proposal Area. No hollows of a suitable size identified within the Proposal Area at time of December 2023 Surveys.			
Paralucia spinifera (Purple Copper Butterfly)	Endangered	Vulnerable	The species occurs above 850 m elevation. Geology, soils, topographic position, and dominant vegetation canopy species vary between habitat locations. However, vegetation structure is consistent, commonly open woodland or open forest with a sparse understorey that is dominated by the shrub, Native Blackthorn (Bursaria spinosa subsp. lasiophylla). The Proposal Area does not occur at this elevation.	None – the Proposal Area does not occur at a suitable elevation for this species, nor was Bursaria spinosa subsp. Lasiophylla recorded at the time of survey (December 2023).	No impact to foraging habitat or breeding habitat is expected as no appropriate habitat is within the Proposal Area.	No further assessment required.
Petauroides volans (Greater Glider)	Endangered	Endangered	This species is typically found in eucalypt forests and woodlands, where it feeds exclusively on eucalypt leaves, buds, flowers, and mistletoe. During the day, individuals shelter in tree	Moderate - Potential foraging and breeding habitat for this species was identified within the Proposal Area.	The Proposed Activity is expected to have a minimal impact on potential foraging or breeding habitat as only small areas require clearing. Large areas of habitat will	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			hollows and will use up to 18 hollows within their home range. Potential foraging habitat for this species is present surrounding the Proposal Area. Hollows were observed surrounding the Proposal Area during the Site assessment in November 2023.		continue to exist in the locality. Hollow-bearing trees will be retained and protected where practical. A suitably qualified ecologist will conduct pre-clearance surveys and supervise clearing works.	
Petaurus australis (Yellow-bellied Glider)	Vulnerable	Not Listed	This species is typically found in tall, mature eucalypt forests, generally in areas with high rainfall and nutrient-rich soils. It primarily feeds on plant and insect exudates, including nectar, sap, honeydew, and manna, with pollen and insects providing protein. They live in small family groups of two to six individuals and are nocturnal. Dens, often in family groups, are located in hollows of large trees. Both foraging and breeding habitat for this species were identified within the Proposal Area.	Moderate - Potential foraging and breeding habitat for this species was identified within the Proposal Area. Species has been recorded in Proposal Area however last record dates from 2004 (BioNet 2023).	The Proposed Activity is expected to have a minimal impact on potential foraging or breeding habitat as only small areas require clearing. Large areas of habitat will continue to exist in the locality. Hollow-bearing trees will be retained and protected where practical. A suitably qualified ecologist will conduct pre-clearance surveys and supervise clearing works.	No further assessment required.
Petrogale penicillata (Brush-tailed Rock-wallaby)	Endangered	Vulnerable	This species is known to occupy rocky escarpments, outcrops, and cliffs, with a preference for complex structures that have fissures, caves, and ledges, often facing north. However, no such habitat was present within the Proposal Area.	None – no suitable habitat is present within the Proposal Area.	Minimal. No anticipated impact to foraging or breeding habitat.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
Petroica boodang (Scarlet Robin)	Vulnerable	Not Listed	This species typically lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. Scarlet Robin habitat usually contains abundant logs and fallen timber, which are important components of its habitat. Both potential breeding and foraging habitat for this species were present within the Proposal Area.	Moderate – potential breeding and foraging habitat is present within the Proposal Area. No records of species in the locality of the Proposal Area.	The Proposed Activity is expected to have a minimal impact on potential foraging and breeding habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species.	No further assessment required.
Phascolarctos cinereus (Koala)	Endangered	Endangered	This species forages on the foliage of more than 70 eucalypt species and 30 non-eucalypt species. It breeds in eucalypt woodlands and forests. Potential foraging and breeding habitat for this species was identified within the Proposal Area.	Moderate – potential breeding and foraging habitat is present within the Proposal Area. No records of species in the Proposal Area.	The Proposed Activity is expected to have a minimal impact on potential foraging and breeding habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species.	No further assessment required.
Polytelis swainsonii (Superb Parrot)	Vulnerable	Vulnerable	This species inhabits Box-Gum, Box-Cypress-pine, and Boree woodlands, as well as River Red Gum Forests. They feed in trees, understorey shrubs, and on the ground, with their diet consisting mainly of grass seeds and herbaceous plants, as well as fruits, berries, nectar, buds, flowers, insects, and grain. For nesting, they typically use tree	Moderate – potential breeding and foraging habitat is present within the Proposal Area. No records of species in the locality of the Proposal Area.	The Proposed Activity is expected to have a minimal impact on potential foraging or breeding habitat as only small areas require clearing. Large areas of habitat will continue to exist in the locality. Hollow-bearing trees will be retained and protected where practical. A suitably qualified ecologist	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			hollows with an entrance diameter of 6 cm or wider, located at least 3.5 m above the ground. They often nest in small colonies, with more than one nest in a single tree. Potential foraging and breeding habitat for this species was identified within the Proposal Area.		will conduct pre-clearance surveys and supervise clearing works.	
Pteropus poliocephalus (Grey-headed Flying-fox)	Vulnerable	Vulnerable	This species primarily feeds on the nectar and pollen of native trees, particularly Eucalyptus, Melaleuca, and Banksia, as well as on the fruits of rainforest trees and vines. Potential foraging habitat for this species is present surrounding the Proposal Area. Roosting camps for this species are typically located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Potential foraging habitat present within Proposal Area. However, no known roosting camps occur within or in close proximity to the Proposal Area.	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species. The species is mobile in nature.	No further assessment required.
Rostratula australis (Australian Painted Snipe)	Endangered	Endangered	This species prefers fringes of swamps, dams, and nearby marshy areas where there is a cover of grasses, lignum, low scrub, or open timber. They	None – no suitable habitat is present within the Proposal Area.	Negligible. No anticipated impact to foraging or breeding habitat.	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
			forage nocturnally on mud-flats and in shallow water, feeding on worms, molluscs, insects, and some plant matter. They nest on the ground amongst tall vegetation, such as grasses, tussocks, or reeds. No nests were identified within the Proposal Area during November 2023 surveys. No foraging habitat is present within the Proposal area.			
Stagonopleura guttata (Diamond Firetail)	Vulnerable	Not Listed	This species is typically found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum (Eucalyptus pauciflora) Woodlands. It also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. It is often found in riparian areas, such as rivers and creeks, and sometimes in lightly wooded farmland. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. potential foraging habitat for this species as identified within the Proposal Area. No nests were identified in the Proposal Area at time of December 2023 surveys.	Low – potential foraging habitat is present within the Proposal Area however no breeding habitat was identified; species is mobile in nature.	The Proposed Activity is expected to have a minimal impact on potential foraging habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species. The species is mobile in nature	No further assessment required.

Species (common name)	BC Act	EPBC Act	Habitat present	Likelihood of occurrence	Impact	Further Assessment Required
Synemon plana (Golden Sun Moth)	Vulnerable	Vulnerable	Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which the ground layer is dominated by wallaby grasses (Austrodanthonia spp.). The larvae are thought to feed exclusively on the roots of wallaby grasses. Marginal habitat presents within the Proposal Area.	Low – potential habitat is present however no records of the species within the locality of the Proposal Area. Occurrences of Austrodanthonia in Proposal Area was sporadic in nature.	The Proposed Activity is expected to have a minimal impact on potential habitat, as only small areas require clearing, with large areas of habitat continuing to occur in the locality. The site assessments conducted in December 2023 did not detect this species.	No further assessment required.

Appendix B. Threatened species tests of significance

Listed species and communities – Biodiversity Conservation Act

The following table outlines the Test of Significance as per s.7.3 of the Biodiversity Conservation Act for 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 Riverina Bioregions.

Criterion		Assessment
A. In the case of a threatened species, whether the Proposed Activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,		Not a threatened species.
B. In the case of an endangered ecological community or critically endangered ecological community, whether the Proposed Activity 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	The Proposed Activity is not 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. Only 2.48 ha (44 ha estimated to remain in 1500m buffer surrounding Proposal Area) of low to moderate condition White Box – Yellow Box – Blakely's Red Gum Grassy Woodland on the edge of tracks and within a highly disturbed creek and surrounds will be impacted. A significant portion of the ecological community will be retained in the broader area. Measures will be implemented to mitigate the impacts on vegetation, including further refinement of the plans. Additionally, rehabilitation efforts will involve planting species that are representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
	II. Is likely to modify the composition of the ecological community substantially and adversely such that its local occurrence is likely to be placed at risk of extinction,	The Proposed Activity is not likely to modify the composition of the ecological community in such a way that its local occurrence is likely to be placed at risk of extinction. Only 2.48 ha (44ha estimated to remain in 1500m buffer surrounding Proposal Area) of low to moderate condition White Box – Yellow Box – Blakely's Red Gum Grassy Woodland on the edge of tracks and within a highly disturbed creek and surrounds will be impacted. A significant portion of the ecological community will be retained in the broader area. Measures will be implemented to mitigate the impacts on vegetation, including further refinement of the plan. Additionally, rehabilitation efforts will involve planting species that are representative

Criterion		Assessment
		of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland.
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 Activity or activity, and	Only 2.48 ha (44ha estimated to remain in 1500m buffer surrounding Proposal Area) of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland on the edge of tracks and within a highly disturbed creek and surrounds is proposed to be impacted with a significant amount being retained in the greater locality.
	II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the Proposed Activity or activity, and	The Proposed Activity will not fragment or increase the fragmentation of the ecological community. This is because works are planned to occur on the edges of existing patches, specifically alongside a track (Long Swamp Road) and within a highly disturbed creek. A significant portion of the ecological community will be retained in the broader area. Measures will be implemented to mitigate the impacts on vegetation, including further refinement of the plan. Additionally, rehabilitation efforts will involve planting species that are representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland.
	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 to be removed is not of high quality or importance for the ongoing survival of the ecological community in the locality. It has been assessed as being of low to moderate condition, indicating that it may not be providing the sole resources or support for the ecological community. Additionally, there are higher-quality habitats in the surrounding area that are providing better support for the ecological community and will be retained. Measures will be implemented to mitigate the impacts on vegetation, including further refinement of the plan. Additionally, rehabilitation efforts will involve planting species that are representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland.
D. Whether the Proposed Activity or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),		The Proposed Activity is not likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).
E. Whether the Proposed Activity or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.		The proposal will contribute to key threatening process (KTP), as listed in the BC Act, clearing of native vegetation, however, contribution of the proposal to this KTP is low considering the large area of high-quality connected bushland that will continue to occur within the locality.

Listed species and communities – Environment Protection and Biodiversity Conservation Act

The following table outlines the Assessment of Significant Impact Criteria as per EPBC Act 1999 for White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will…

Criterion	Assessment
… reduce the extent of an ecological community	The Proposed Activity will not significantly reduce the extent of the ecological community. Only 2.48 ha (44ha estimated to remain in 1500m buffer surrounding Proposal Area) of low to moderate condition White Box – Yellow Box – Blakely's Red Gum Grassy Woodland on the edge of tracks and within a highly disturbed creek and surrounds will be impacted. A significant portion of the ecological community will be retained in the broader area. Measures will be implemented to mitigate the impacts on vegetation, including further refinement of the plan. Additionally, rehabilitation efforts will involve planting species that are representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
… fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The Proposed Activity will not fragment or increase the fragmentation of the ecological community. This is because works are planned to occur on the edges of existing patches, specifically alongside a track (Long Swamp Road) and within a highly disturbed creek. A significant portion of the ecological community will be retained in the broader area. Measures will be implemented to mitigate the impacts on vegetation, including further refinement of the plan. Additionally, rehabilitation efforts will involve planting species that are representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
… adversely affect habitat critical to the survival of an ecological community	The Proposed Activity will not adversely affect habitat critical to the survival of an ecological community. This is because only 2.48 ha (44ha estimated to remain in 1500m buffer surrounding Proposal Area) of low to moderate condition White Box – Yellow Box – Blakely's Red Gum Grassy Woodland on the edge of tracks and within a highly disturbed creek and surrounds is to be impacted. A significant amount of the ecological community will be retained in the greater locality. Mitigation of vegetation impacts will occur through further plan refinement. Additionally, rehabilitation works will include the planting of species representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
… modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	The Proposed Activity will not modify or destroy abiotic (non-living) factors necessary for an ecological community's survival. Specifically, the activity will not change groundwater levels. A significant portion of the ecological community will be retained in the broader area. Measures will be implemented to mitigate the impacts on vegetation, including further refinement of the plan. Additionally, rehabilitation efforts will involve planting species that are representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

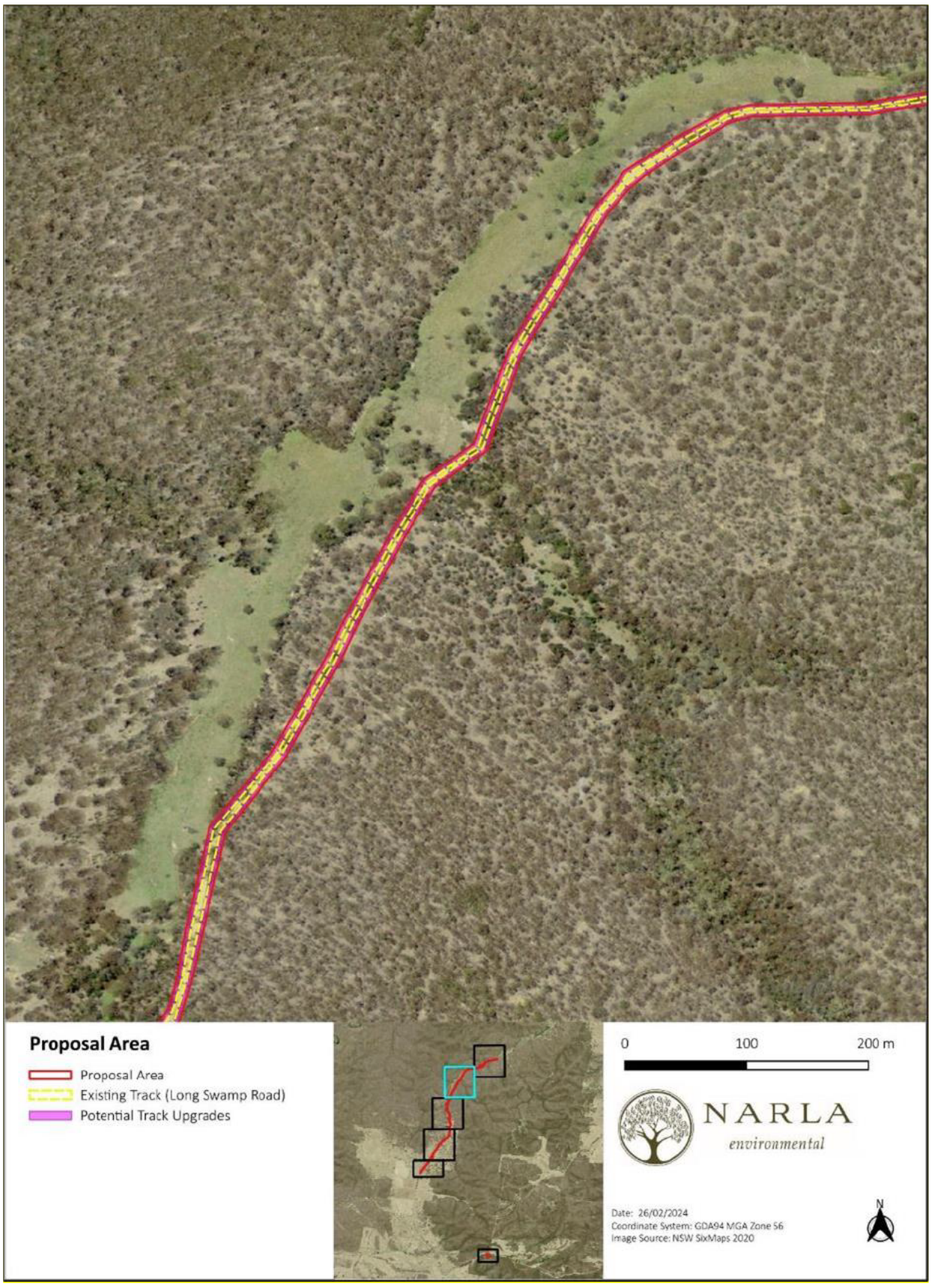
Criterion	Assessment
… cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The Proposed Activity will not cause a substantial change in the species composition of the ecological community. This is because a significant amount of the ecological community will be retained in the greater locality, mitigating the impact of the activity. Additionally, the proposed mitigation measures, such as the further refinement of the plan and the rehabilitation works, will include the planting of species representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. No regular burns, flora, or fauna harvesting are proposed as a result of the Proposed Activity.
… cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:	
• assisting invasive species, that are harmful to the listed ecological community, to become established, or	The Proposed Activity will not assist invasive species in becoming established. While there is potential for the introduction of weeds and pathogens into the area during construction works, primarily due to the importation of plant, equipment, and materials, measures will be taken to manage this. Some weeds will be removed through track upgrades and the replacement of the existing flume. A Weed and Pathogen Management plan will be implemented, including a protocol for managing declared priority weeds under the Biosecurity Act 2015 during and after construction, a weed hygiene protocol for managing the clean importation of plant, equipment, and fill, and monitoring, treating, and reporting occurrences of pathogens such as Myrtle Rust and Phytophthora. During construction, vehicles will not be allowed to travel in vegetation outside the track, and they will be inspected for mud and vegetation matter upon entering the site. Vehicles will also be washed before coming to the site and will exclusively work within the proposal area. The Weed and Pathogen Management procedure will be incorporated as part of the Construction Environmental Management Plan (CEMP), which will be completed prior to construction.
• causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	The Proposed Activity will not cause the regular mobilisation of fertilisers, herbicides, or other chemicals or pollutants into the ecological community that could kill or inhibit the growth of species. Any reportable spills will be immediately reported to the EPA in accordance with the Protection of the Environment Operations Act (POEO Act) and the Department of Planning, Industry and Environment (DPIE). Refuelling will be conducted on flat, clear surfaces at least 40 metres away from tributaries and drains. Plant and vehicles will not be cleaned or washed down on-site. This activity must be carried out in a suitable location outside of the Proposal Area or parks. The wash down of all plant equipment must follow the New South Wales Department of Primary Industries (NSW DPI) Decontamination of Vehicles and Equipment Policy (NSW DPI 2015). Storage of chemicals will be undertaken in line with relevant legislation, policy, and guidelines including the POEO Act and its regulations. All chemical usage will be conducted in accordance with the relevant recommendations of a Material Safety Data Sheet (MSDS). Pre-start vehicle checks will be conducted at the beginning of each day during construction works, and any leaking fuel or fluid tanks must be repaired before access to the Proposal Area is permitted.

Criterion	Assessment
• interfering with the recovery of an ecological community.	The Proposed Activity will not interfere with the recovery of any ecological community. This is because only 2.48 ha of low to moderate condition White Box – Yellow Box – Blakely's Red Gum Grassy Woodland on the edge of tracks and within a highly disturbed creek and surrounds is to be impacted. A significant amount of the ecological community will be retained in the greater locality. Mitigation of vegetation impacts will occur through further plan refinement. Additionally, rehabilitation works will include the planting of species representative of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

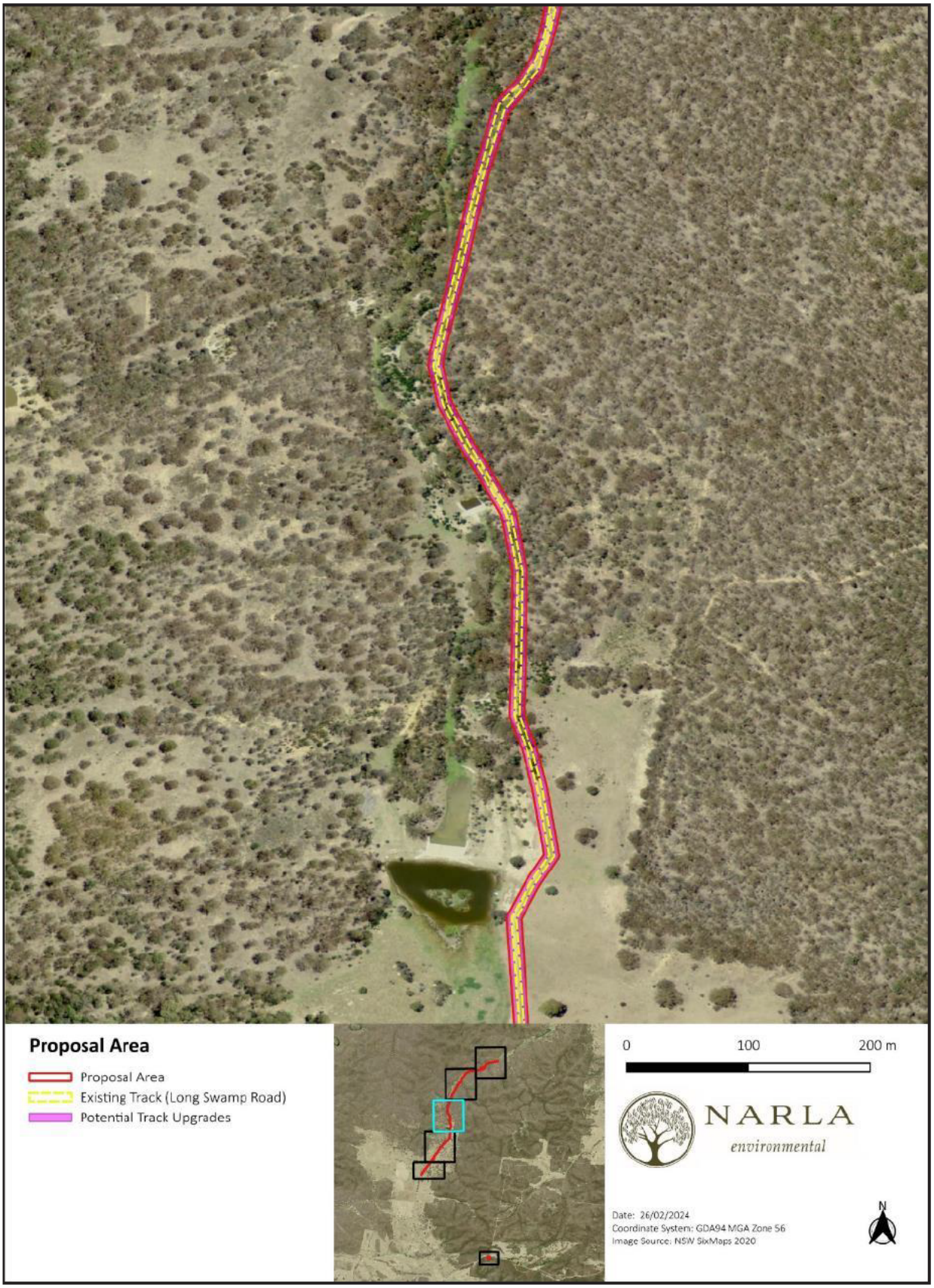
Appendix C. Detailed maps of the Proposal Area

Area 1:

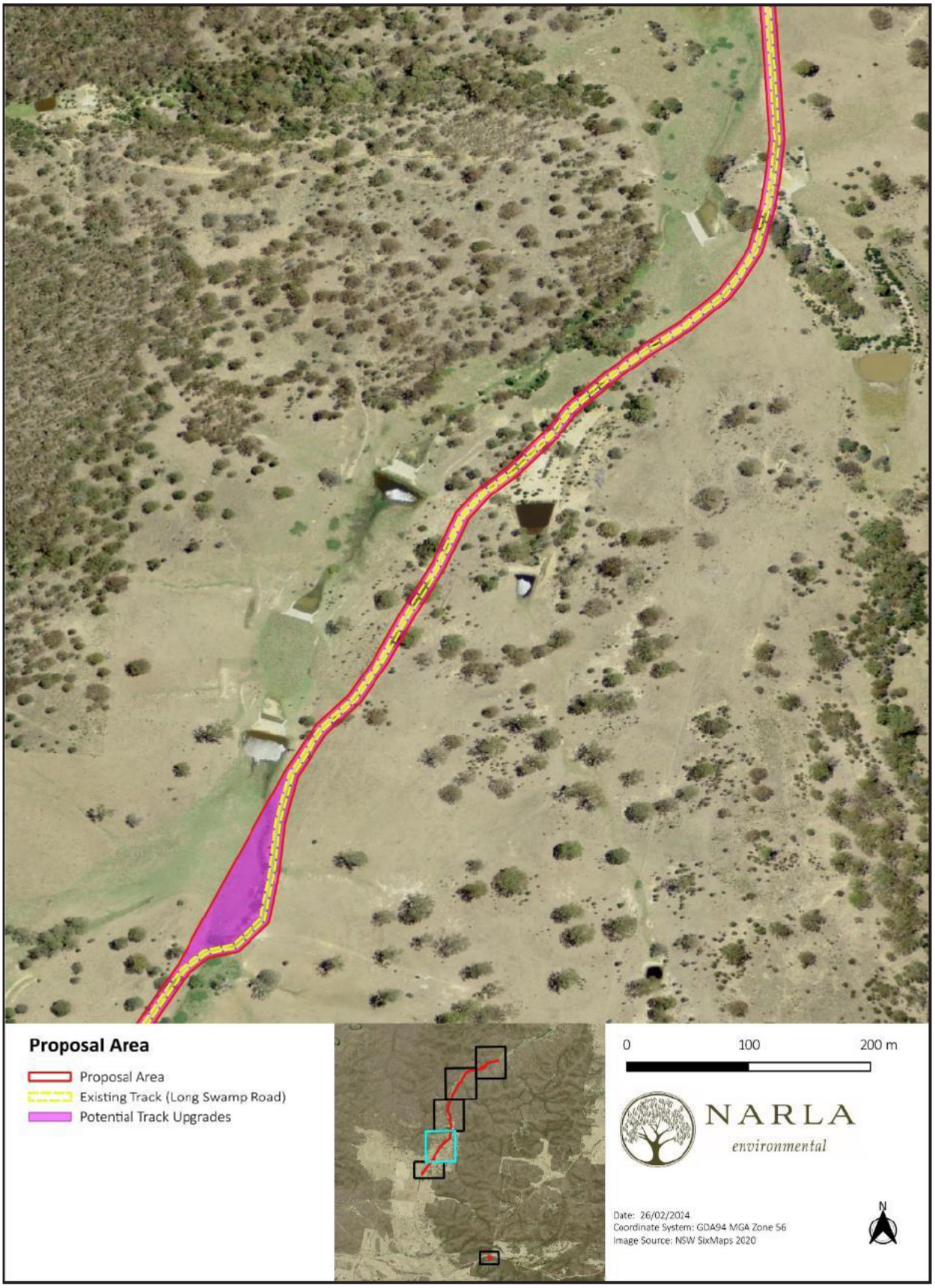
Area 2:


Proposal Area
Proposal Area
Existing Track (Long Swamp Road)
Potential Track Upgrades
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

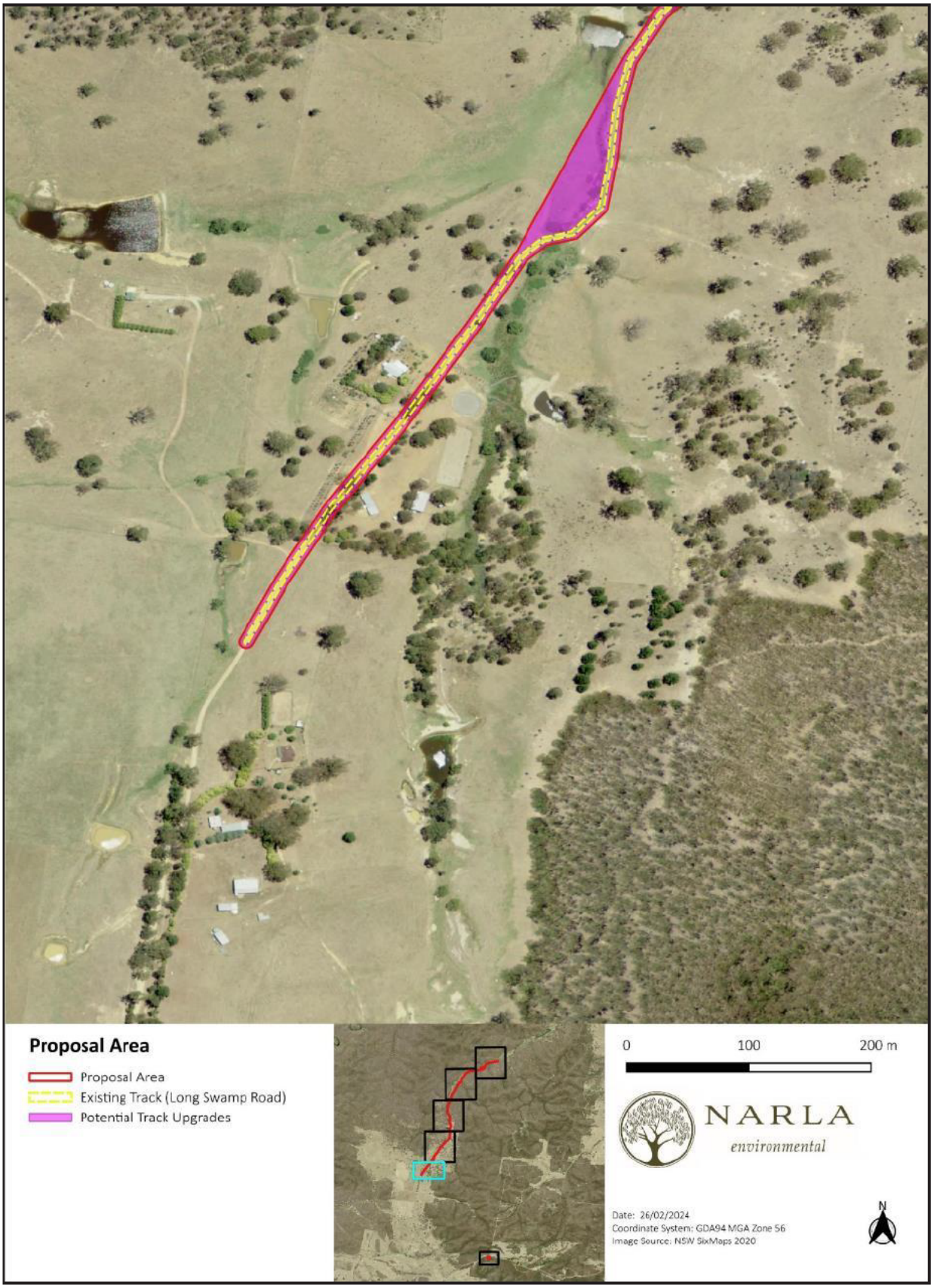
Area 3:


Proposal Area
Proposal Area
Existing Track (Long Swamp Road)
Potential Track Upgrades
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

Area 4:


Proposal Area
Proposal Area
Existing Track (Long Swamp Road)
Potential Track Upgrades
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

Area 5:

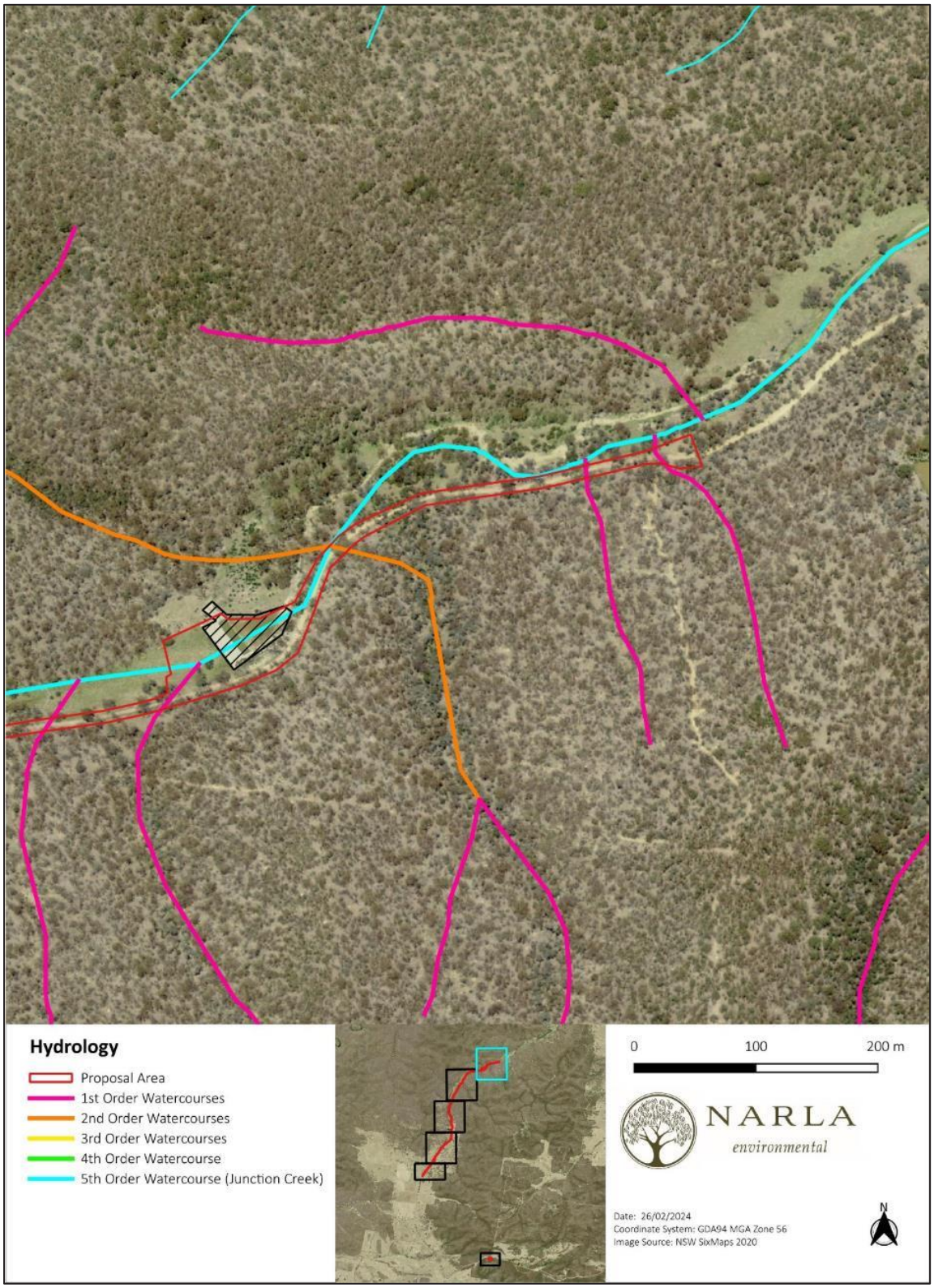

Proposal Area
Proposal Area
Existing Track (Long Swamp Road)
Potential Track Upgrades
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

Area 6:

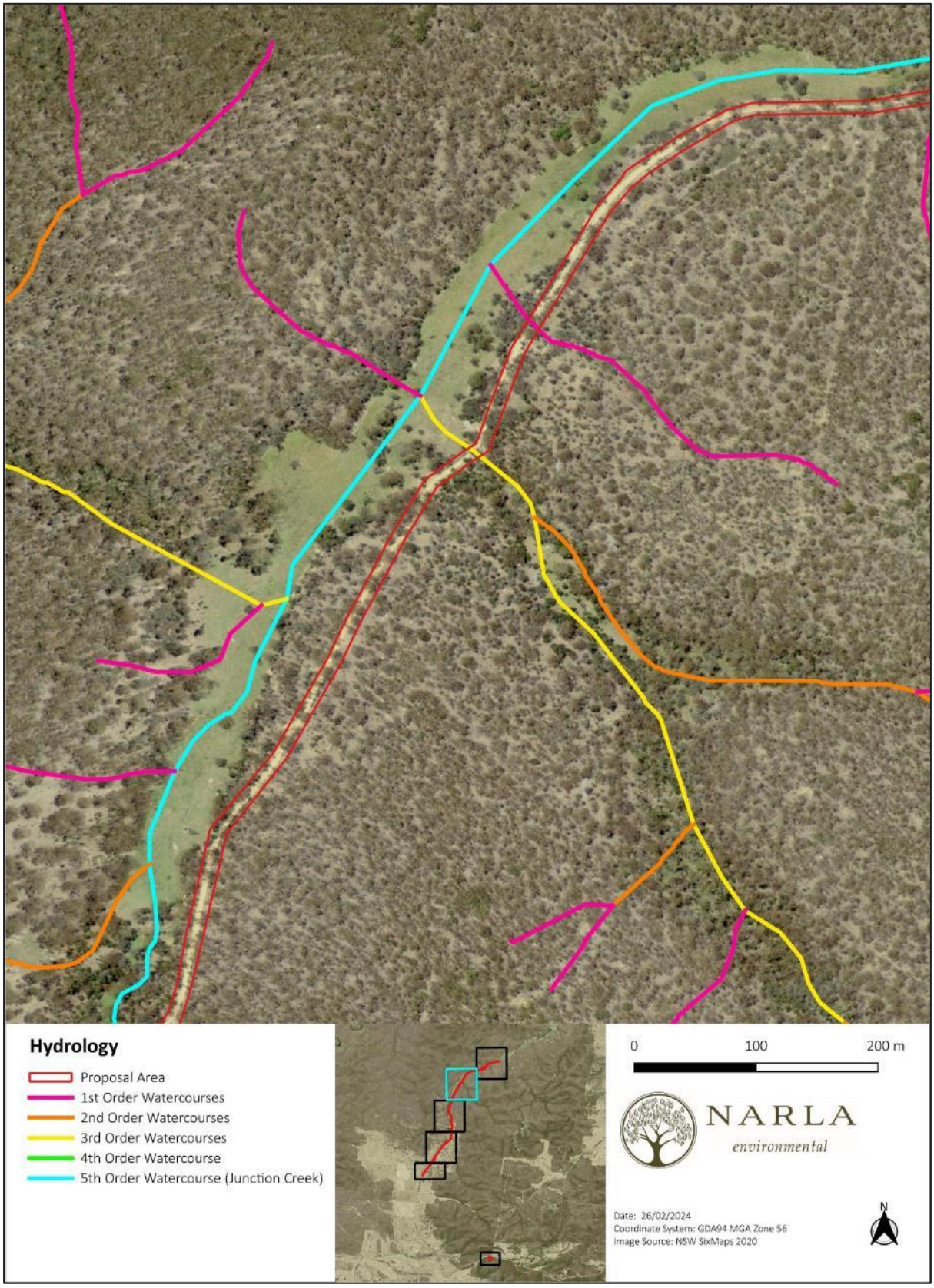

Proposal Area
Proposal Area
Decomissioned Quarry
0
50
100 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020

Appendix D. Mapped watercourses in Proposal Area

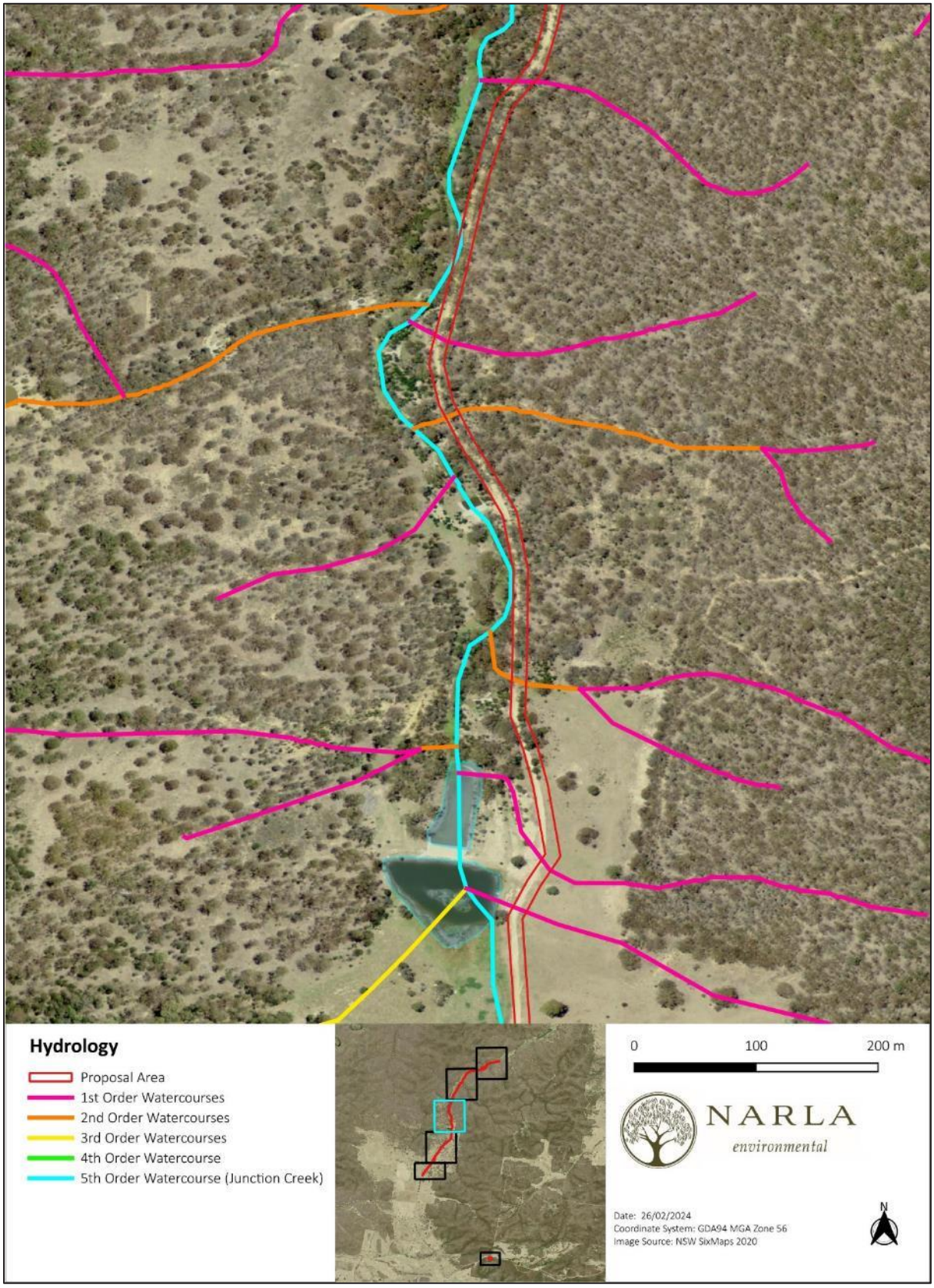
Area 1:



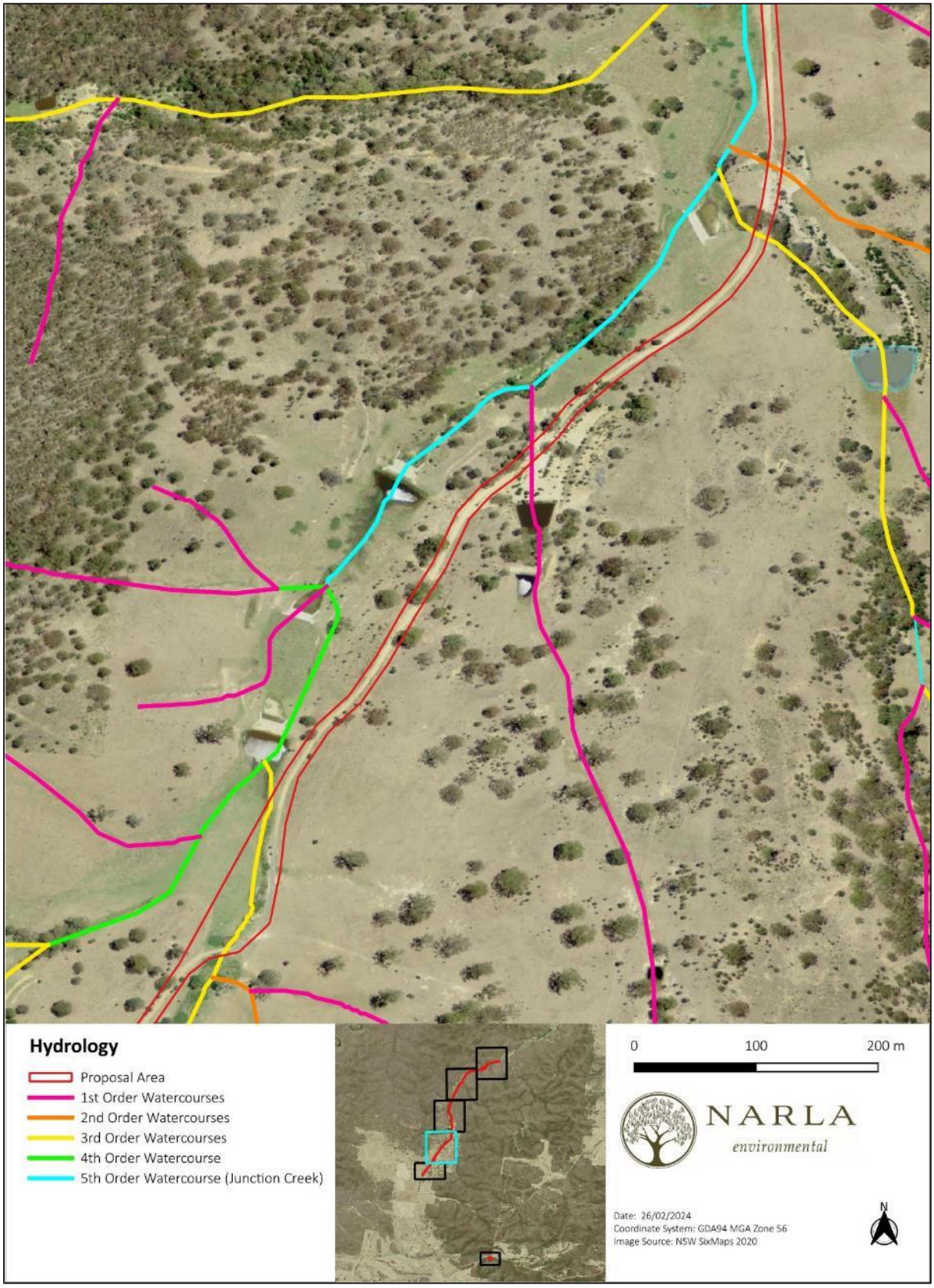
Area 2:


Hydrology
Proposal Area
1st Order Watercourses
2nd Order Watercourses
3rd Order Watercourses
4th Order Watercourse
5th Order Watercourse (Junction Creek)
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

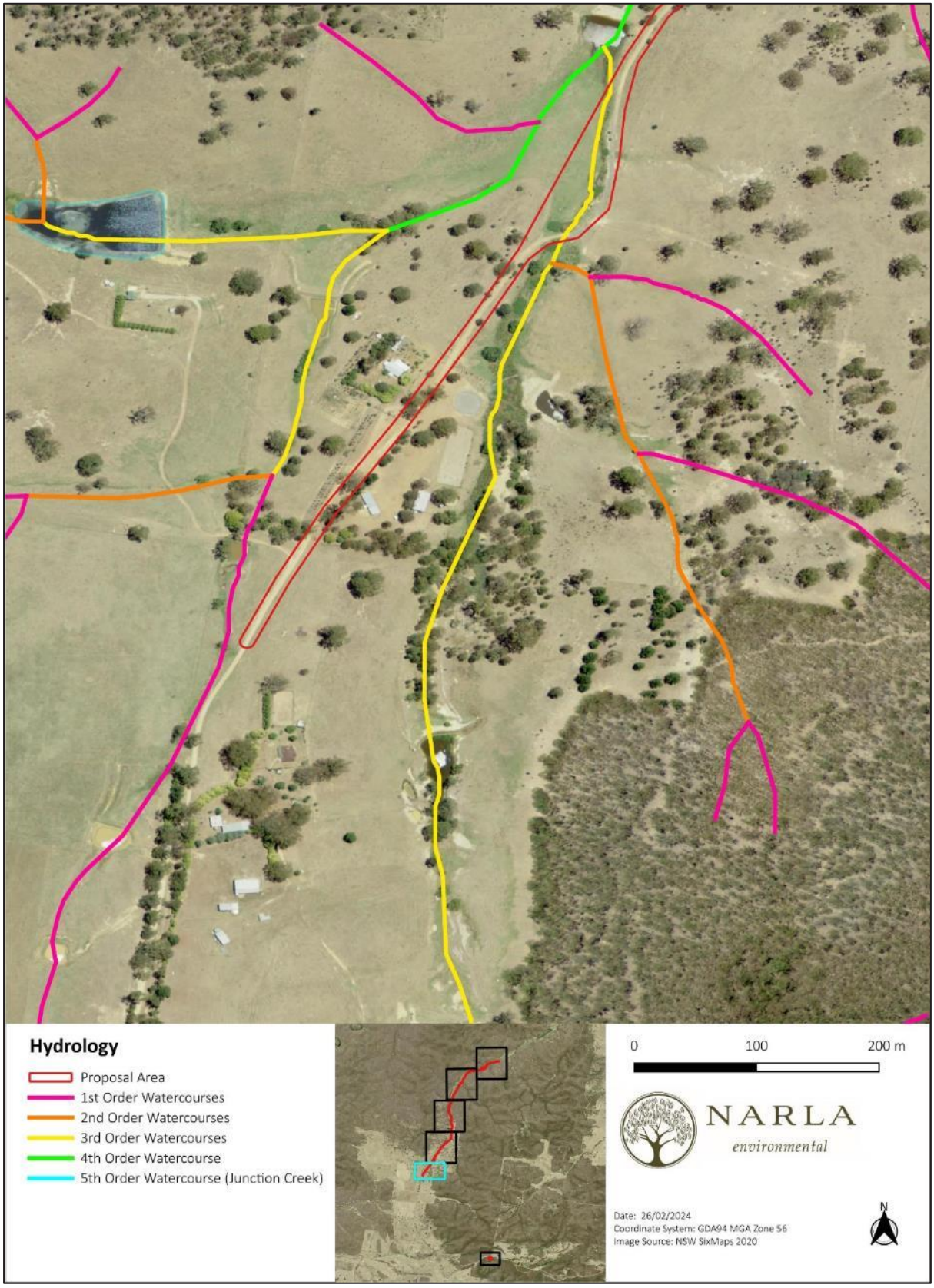
Area 3:


Hydrology
Proposal Area
1st Order Watercourses
2nd Order Watercourses
3rd Order Watercourses
4th Order Watercourse
5th Order Watercourse (Junction Creek)
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

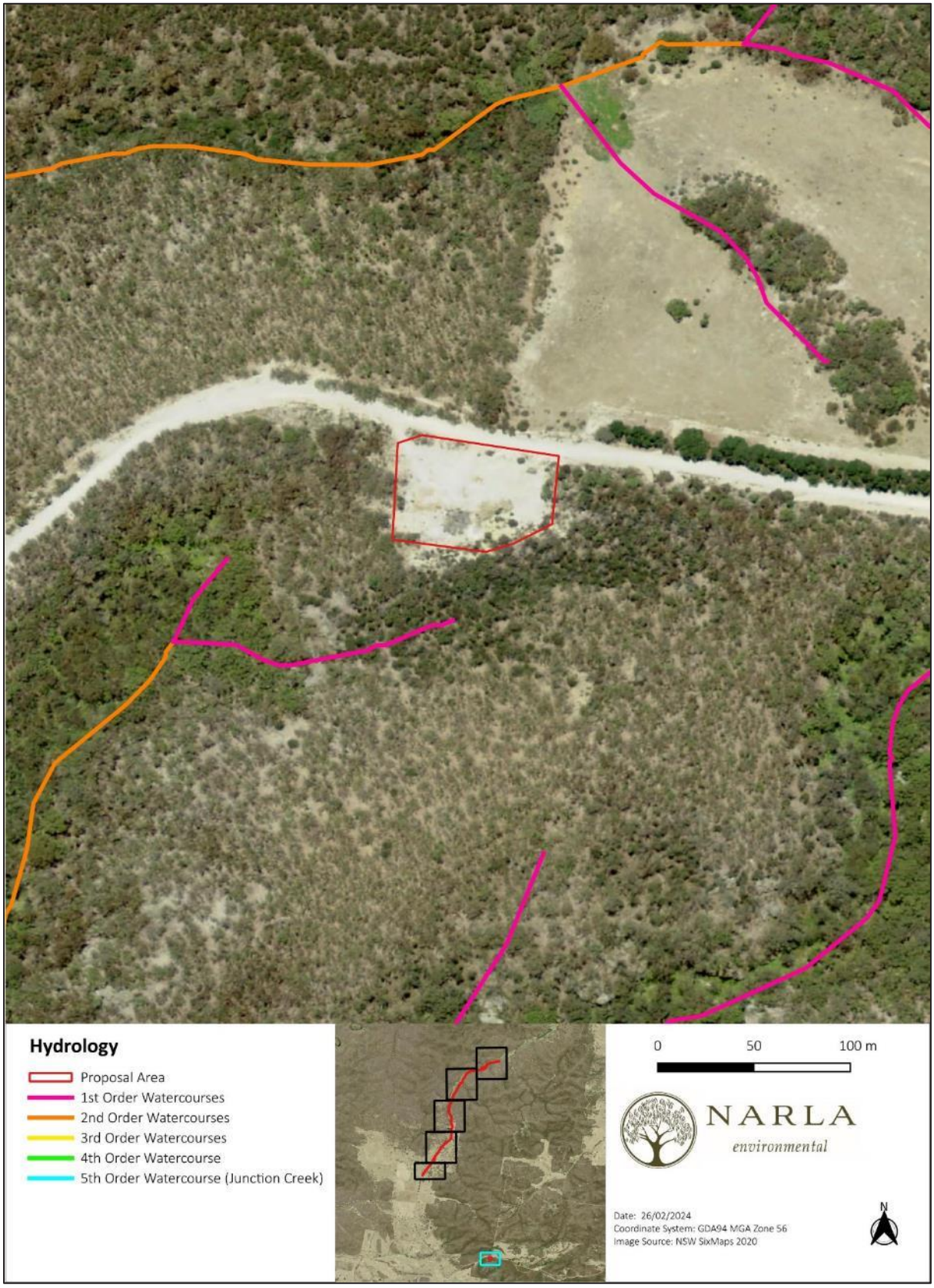
Area 4:


Hydrology
Proposal Area
1st Order Watercourses
2nd Order Watercourses
3rd Order Watercourses
4th Order Watercourse
5th Order Watercourse (Junction Creek)
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

Area 5:

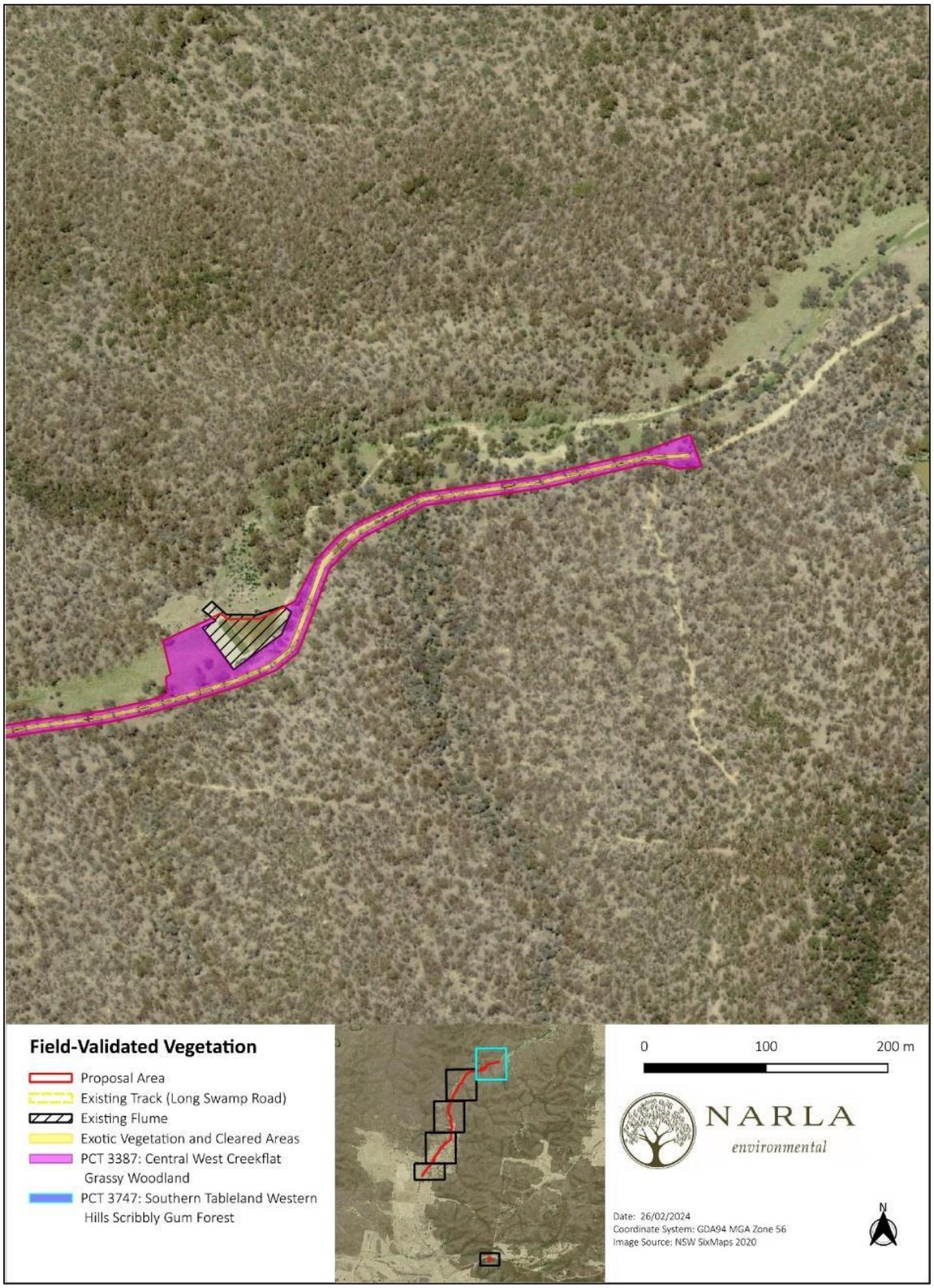

Hydrology
Proposal Area
1st Order Watercourses
2nd Order Watercourses
3rd Order Watercourses
4th Order Watercourse
5th Order Watercourse (Junction Creek)
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

Area 6:

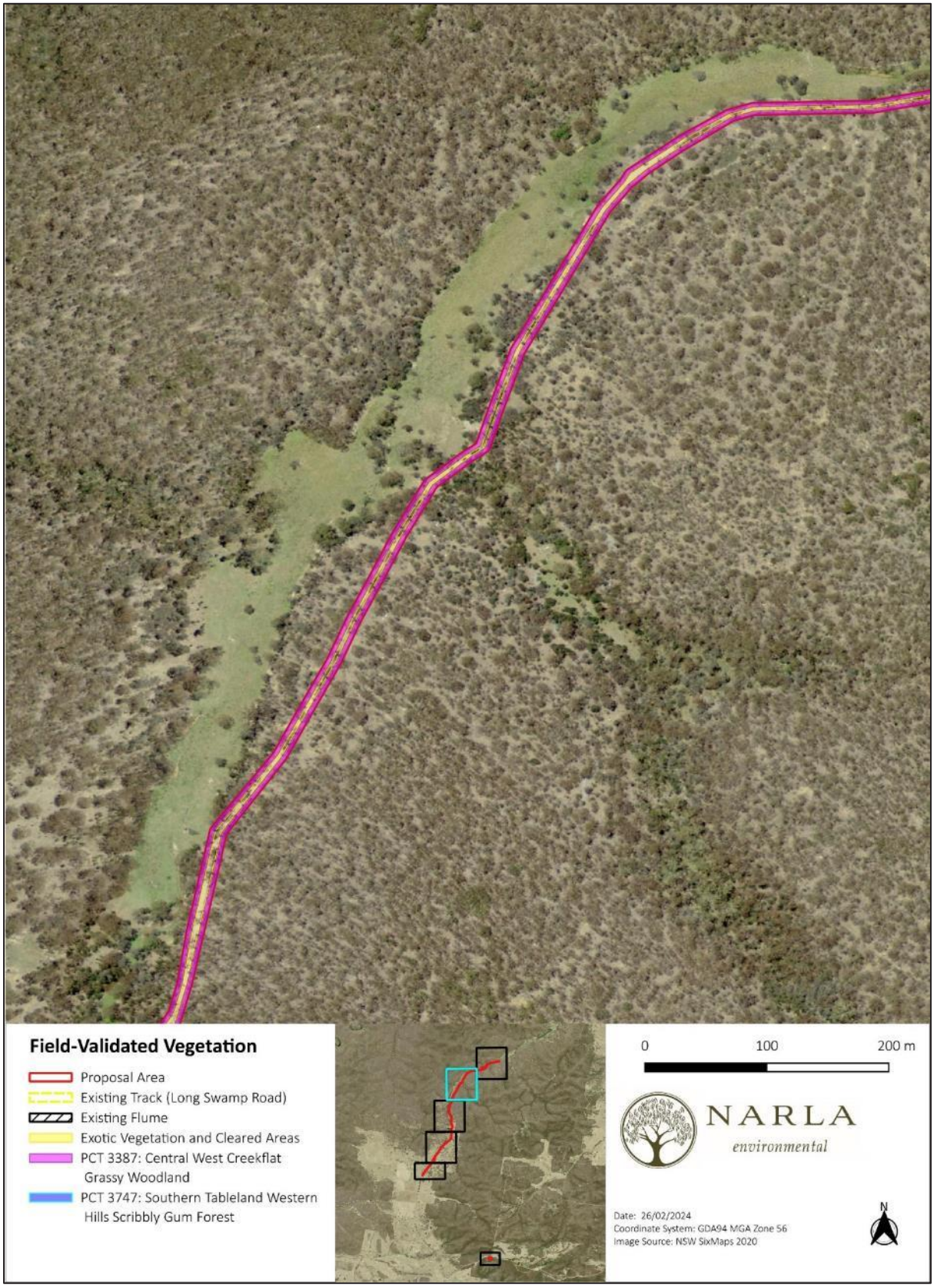

Hydrology
Proposal Area
1st Order Watercourses
2nd Order Watercourses
3rd Order Watercourses
4th Order Watercourse
5th Order Watercourse (Junction Creek)
0
50
100 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

Appendix E. Field validated vegetation in Proposal Area

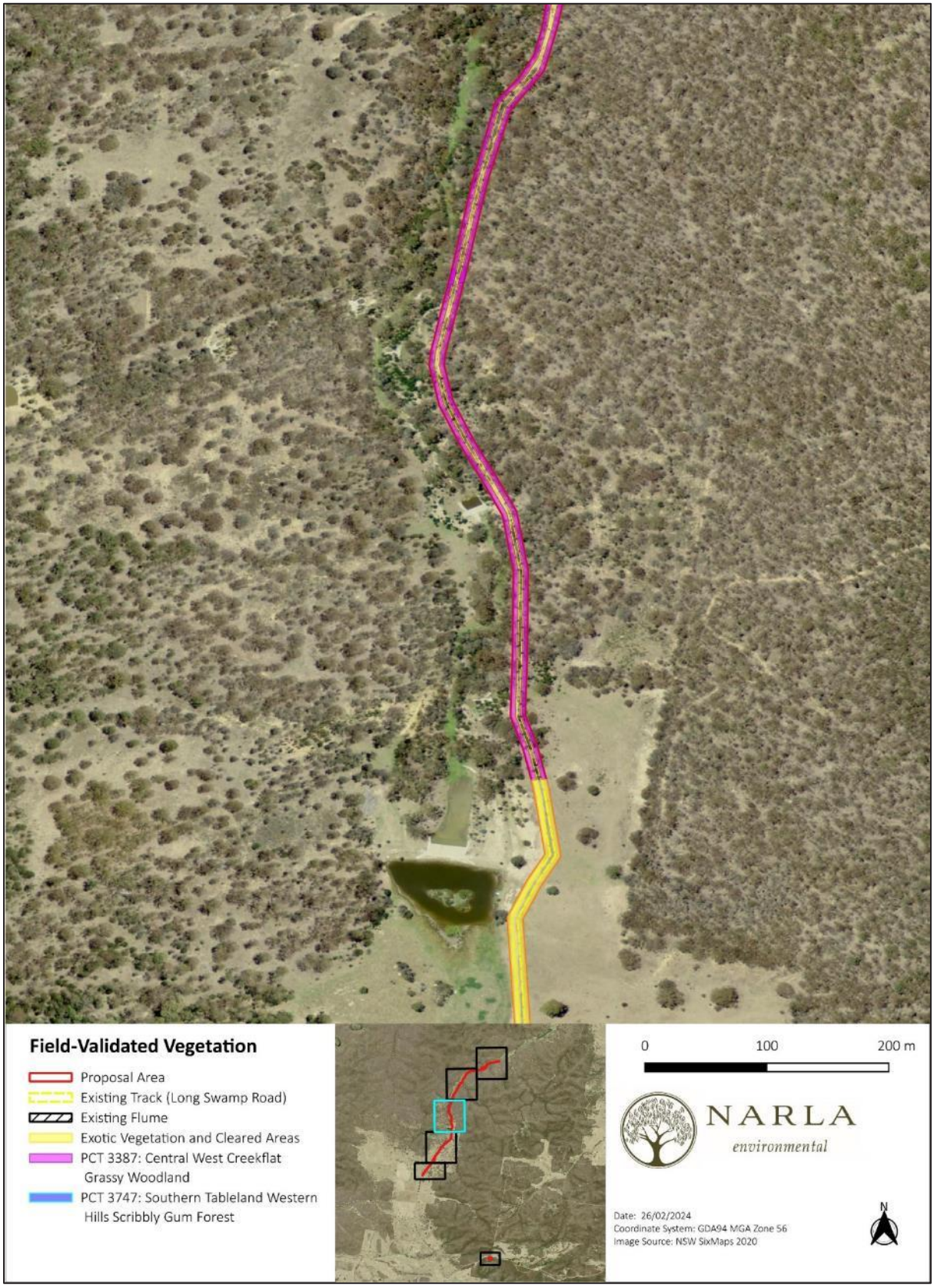
Area 1:



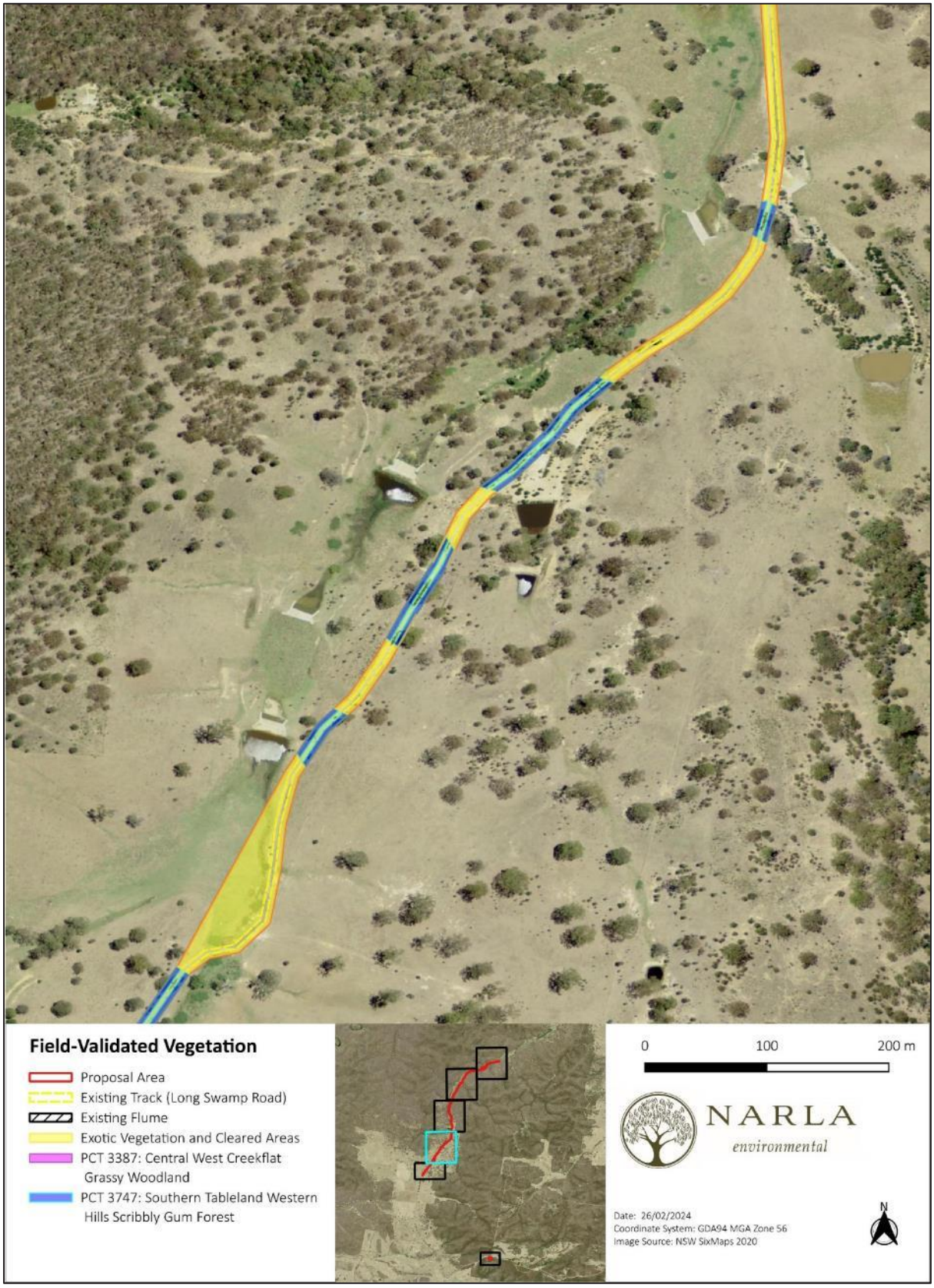
Area 2:


Field-Validated Vegetation
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Exotic Vegetation and Cleared Areas
PCT 3387: Central West Creekflat Grassy Woodland
PCT 3747: Southern Tableland Western Hills Scribbly Gum Forest
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

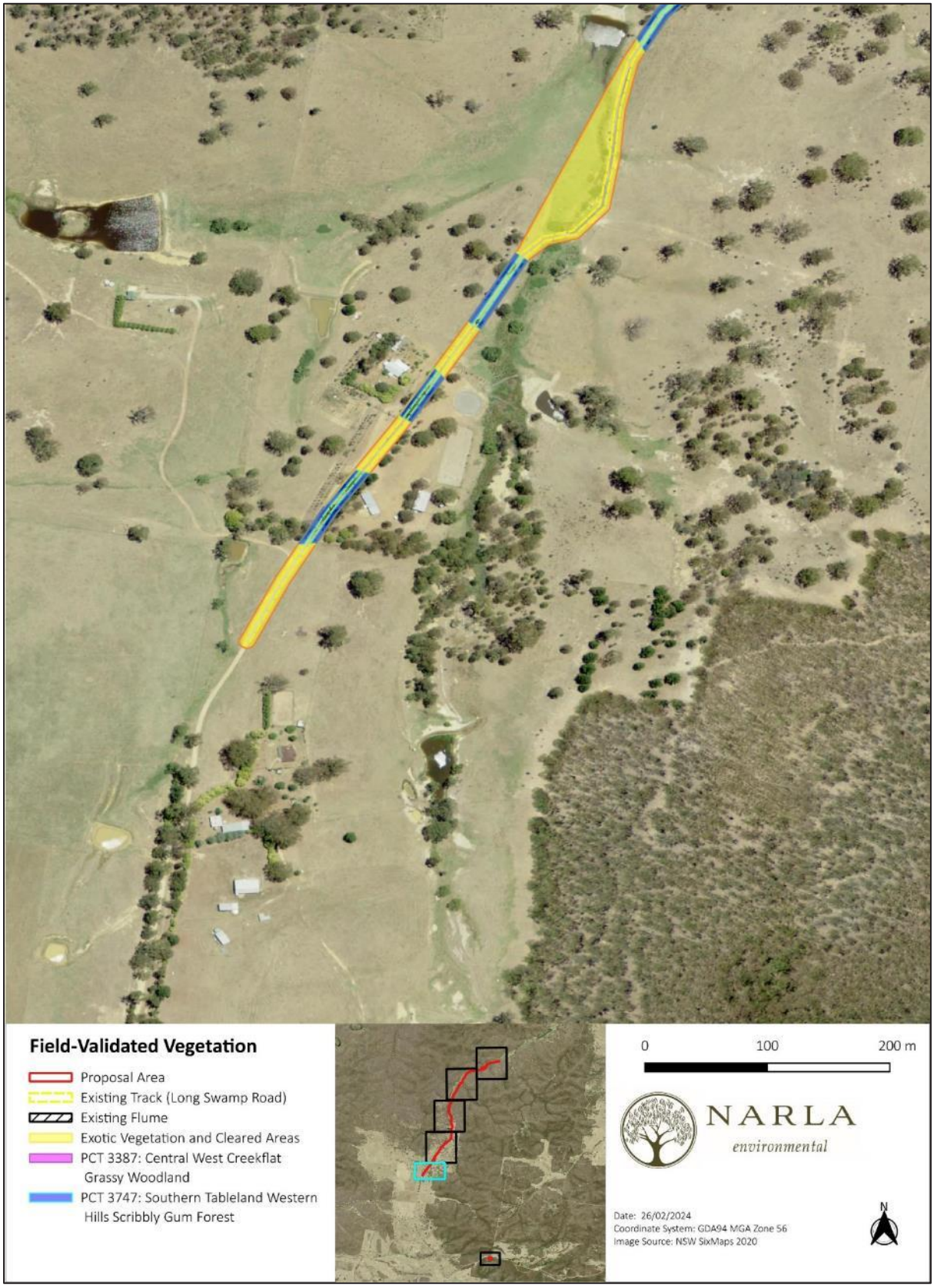
Area 3:


Field-Validated Vegetation
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Exotic Vegetation and Cleared Areas
PCT 3387: Central West Creekflat Grassy Woodland
PCT 3747: Southern Tableland Western Hills Scribbly Gum Forest
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

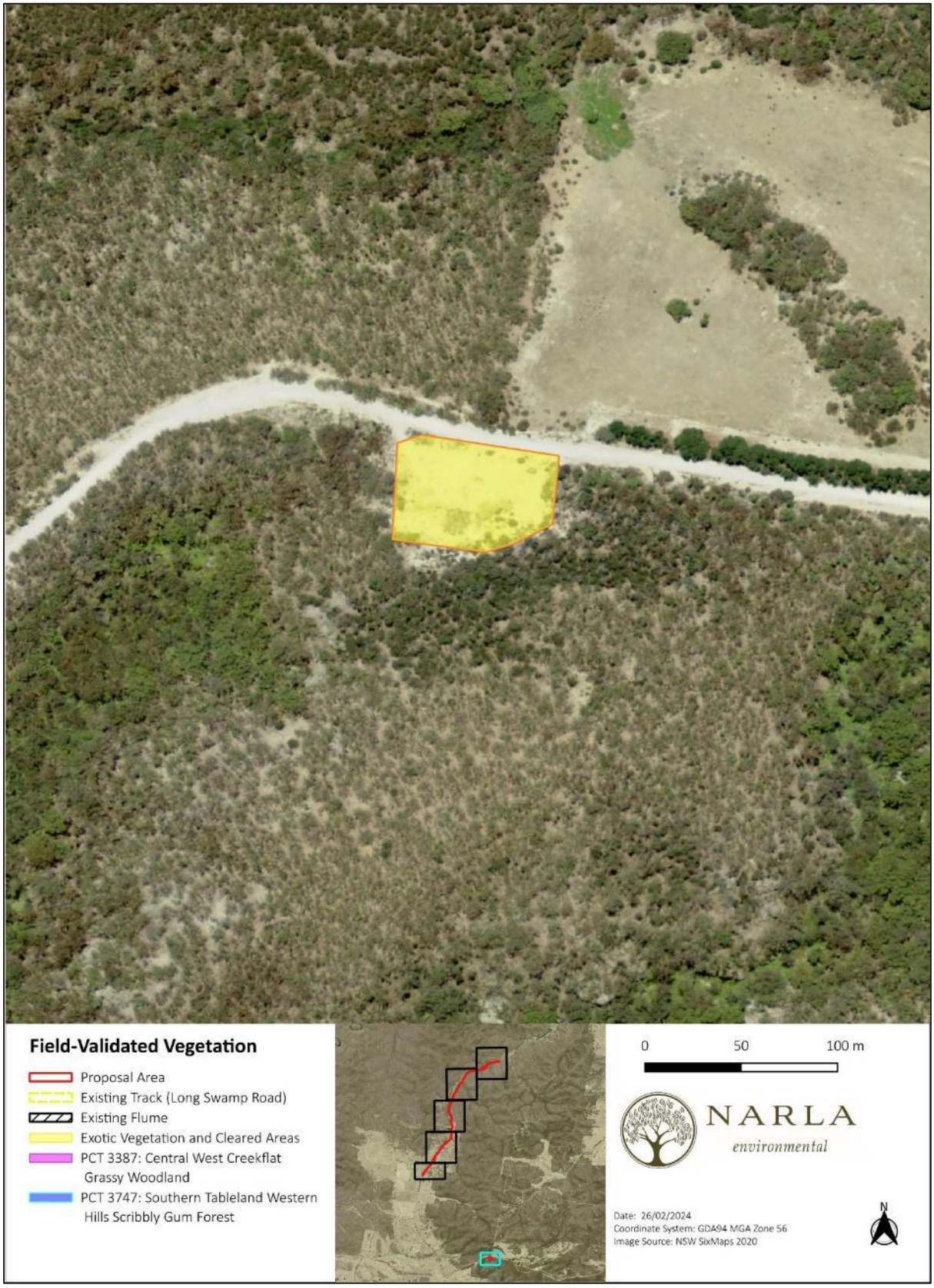
Area 4:


Field-Validated Vegetation
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Exotic Vegetation and Cleared Areas
PCT 3387: Central West Creekflat Grassy Woodland
PCT 3747: Southern Tableland Western Hills Scribbly Gum Forest
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

Area 5:


Field-Validated Vegetation
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Exotic Vegetation and Cleared Areas
PCT 3387: Central West Creekflat Grassy Woodland
PCT 3747: Southern Tableland Western Hills Scribbly Gum Forest
0
100
200 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

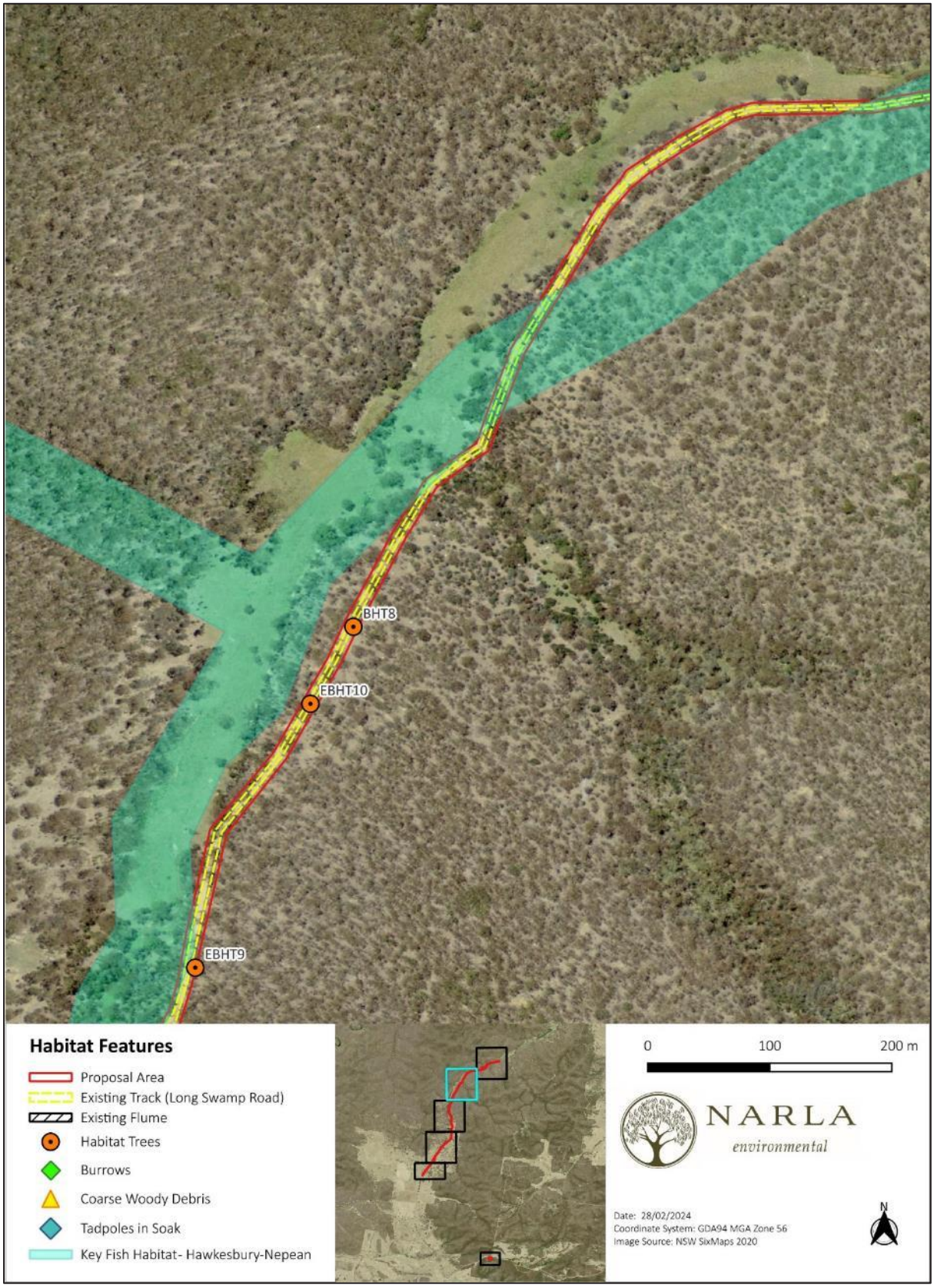
Area 6:


Field-Validated Vegetation
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Exotic Vegetation and Cleared Areas
PCT 3387: Central West Creekflat Grassy Woodland
PCT 3747: Southern Tableland Western Hills Scribbly Gum Forest
0
50
100 m
NARLA
environmental
Date: 26/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

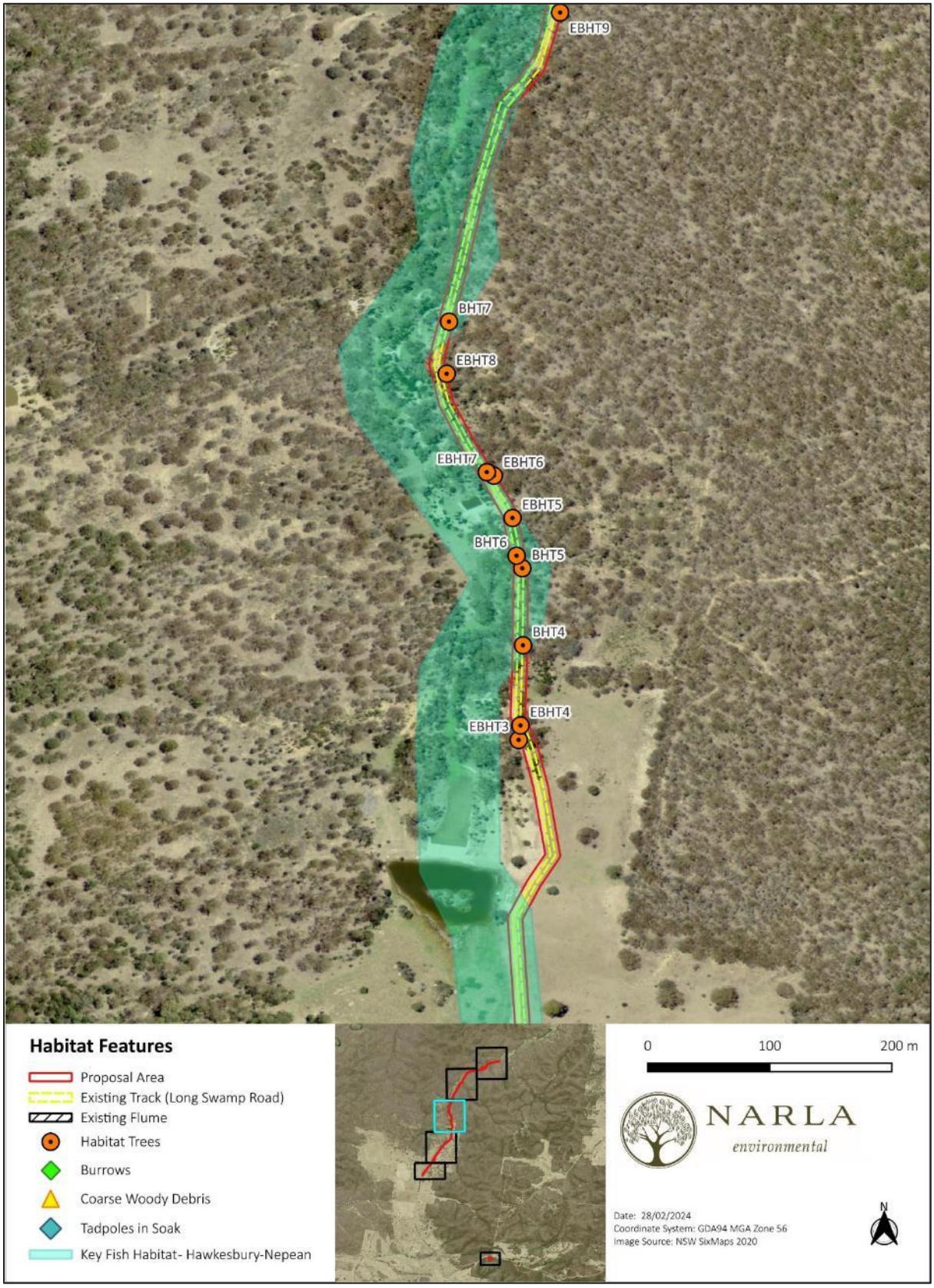
Appendix F. Habitat features present in Proposal Area

Area 1:

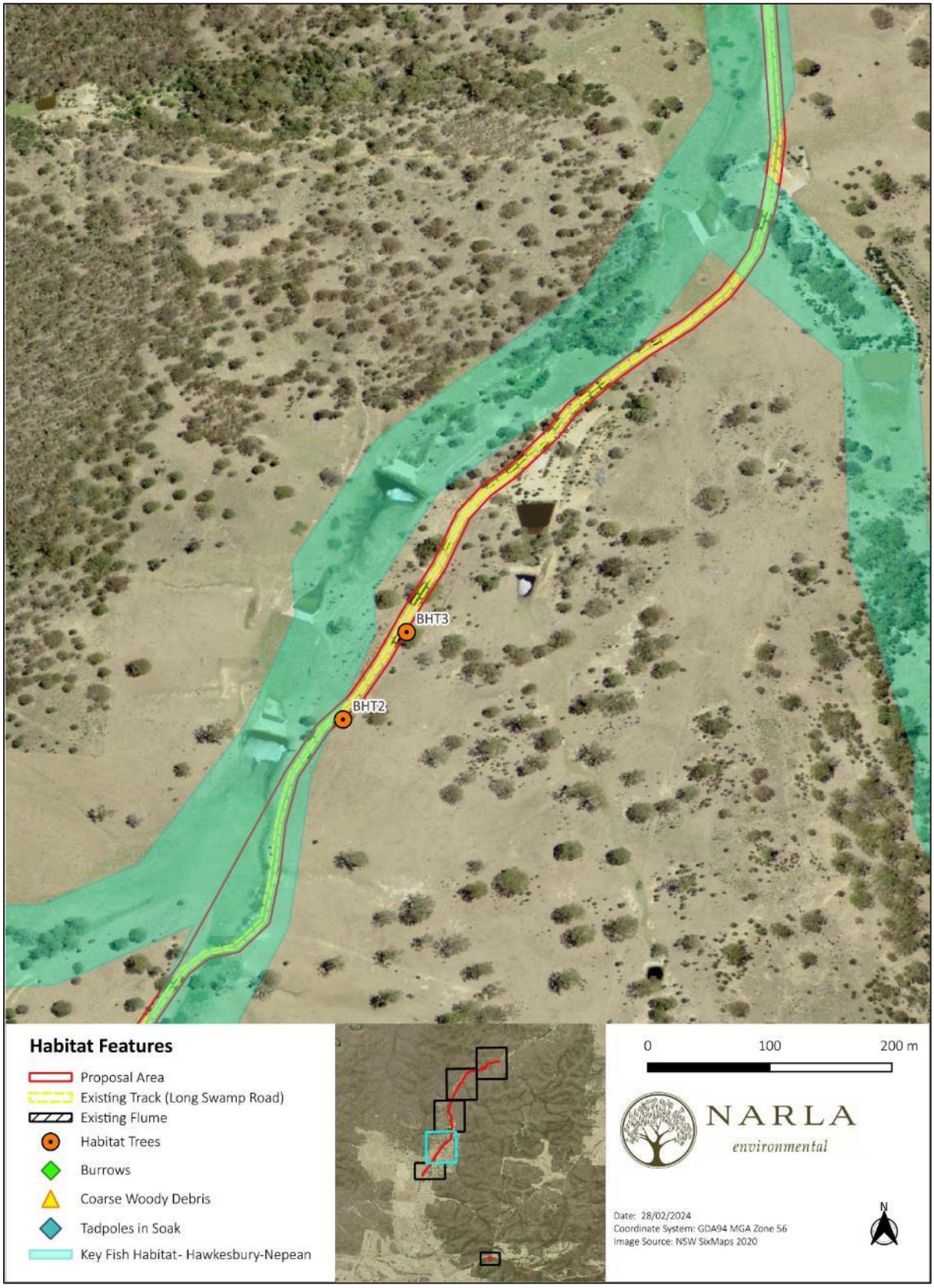
Area 2:


BHT8
EBHT10
EBHT9
Habitat Features
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Habitat Trees
Burrows
Coarse Woody Debris
Tadpoles in Soak
Key Fish Habitat- Hawkesbury-Nepean
0
100
200 m
NARLA
environmental
Date: 28/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

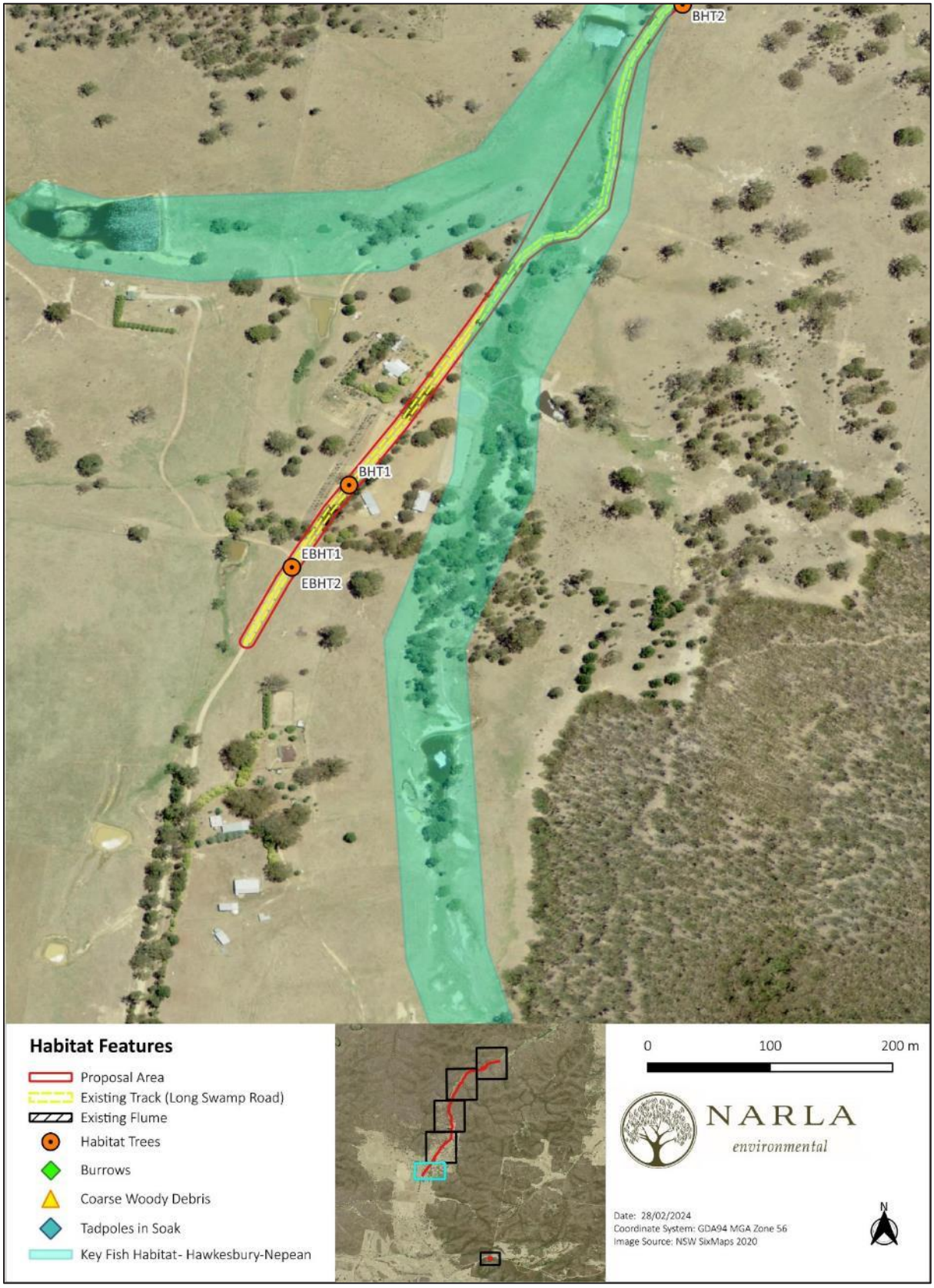
Area 3:


EBHT9
BHT7
EBHT8
EBHT7
EBHT6
EBHT5
BHT6
BHT5
BHT4
EBHT4
EBHT3
Habitat Features
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Habitat Trees
Burrows
Coarse Woody Debris
Tadpoles in Soak
Key Fish Habitat- Hawkesbury-Nepean
0
100
200 m
NARLA
environmental
N
Date: 28/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020

Area 4:


BHT3
BHT2
Habitat Features
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Habitat Trees
Burrows
Coarse Woody Debris
Tadpoles in Soak
Key Fish Habitat- Hawkesbury-Nepean
0
100
200 m
NARLA
environmental
Date: 28/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N

Area 5:


BHT2
BHT1
EBHT1
EBHT2
Habitat Features
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Habitat Trees
Burrows
Coarse Woody Debris
Tadpoles in Soak
Key Fish Habitat- Hawkesbury-Nepean
0
100
200 m
NARLA
environmental
N
Date: 28/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020

Area 6:


Habitat Features
Proposal Area
Existing Track (Long Swamp Road)
Existing Flume
Habitat Trees
Burrows
Coarse Woody Debris
Tadpoles in Soak
Key Fish Habitat- Hawkesbury-Nepean
0
50
100 m
NARLA
environmental
Date: 28/02/2024
Coordinate System: GDA94 MGA Zone 56
Image Source: NSW SixMaps 2020
N