

REPORT

Bank Rehabilitation Works at 6 Sites Along the Nepean River

Addendum to Review of Environmental Factors

Reference: PA3130-RHD-AU-WM-RP-EN-0002

Date: 21 June 2024

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1 Introduction

1.1 Overview

This document comprises a Review of Environmental Factors (REF) for the scour and erosion protection works at six sites along the Nepean River at Camden. It is a written statement prepared for Camden Council (Council) that considers the impact of the proposed scour and erosion protection works on the natural and built environment, and the proposed methods of mitigating or ameliorating any adverse effects.

1.2 Background

The Nepean River has experienced frequent flooding during the most recent La Nina cycle that has been experienced by Eastern Australia during 2020 – 2022. This has included four flood events in 2022 events that had a recurrence interval estimated to be between a 20% and 10% AEP event.

The flooding has resulted in erosion at five sites along the western bank of the Nepean River from the Camden Bypass bridge crossing to the Argyle Street bridge crossing. A sixth site is located on the eastern bank, immediately downstream of Argyle Street road bridge.

Camden Council has engaged Soil Conservation Services (SCS) to prepare designs to stabilise the erosion. This REF has been prepared to assess the environmental impacts associated with these works and nominate mitigation measures where appropriate.

1.3 Structure of this Document

This REF was prepared in support of the proposed bank stabilisation construction activities on behalf of the proponent and determining authority, Council, under Part 5 of the *Environmental Planning & Assessment Act, 1979 (EP&A Act)*.

In summary this REF details:

- The introduction and background to the project (Section 1);
- A description of the project proposal and consideration of alternatives (Section 2);
- A review of the environmental planning framework (Section 3);
- An assessment of the environmental effects (Section 4);
- Identification of the proposed mitigation and control measures that should be employed (Section 5), and,
- A summary of the REF and its findings (Section 6).

The location of the subject sites in the context of the Greater Sydney metropolitan area is shown in **Figure 1-1**. The location plan showing the position of the six sites along the Nepean River is shown in **Figure 1-2**.

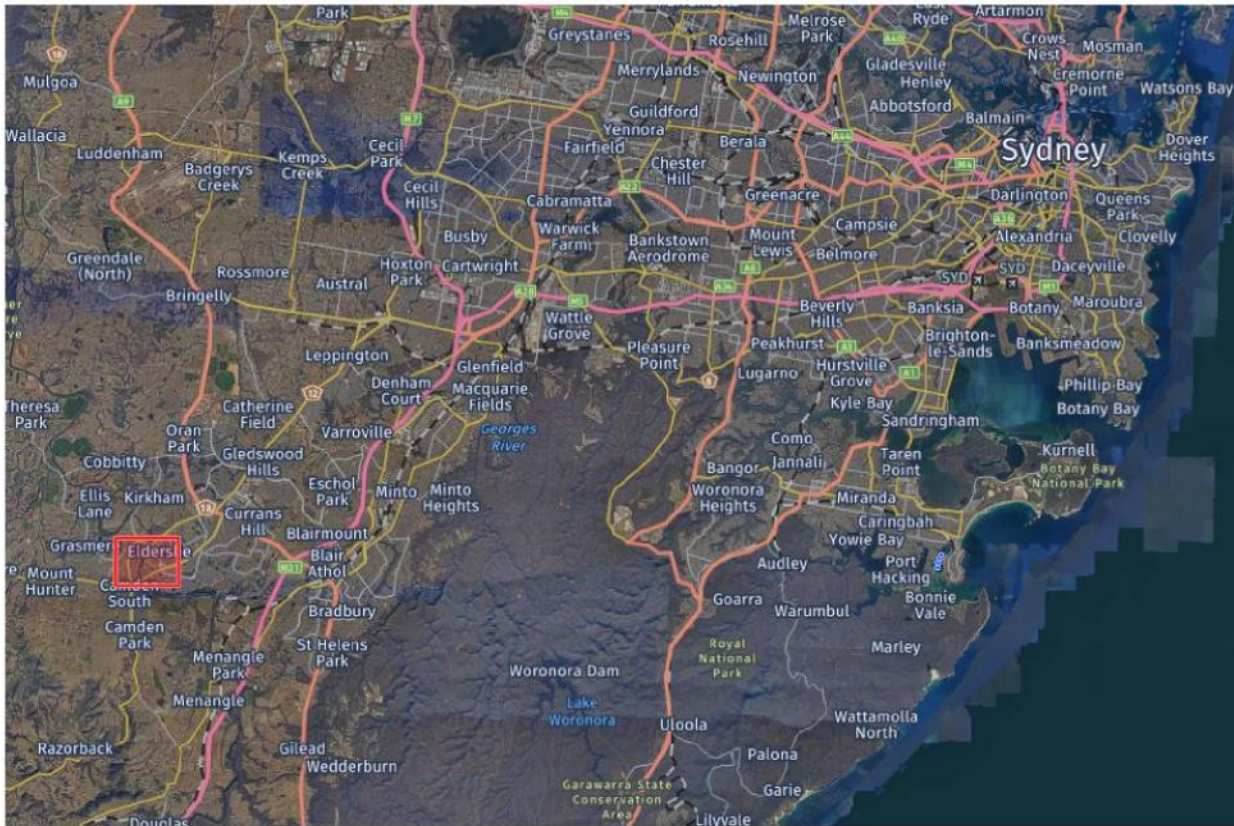


Figure 1-1 Overview of Subject Site Location

The six sites are located as per the summary in **Table 1-1**.

Table 1-1 Location of Erosion Sites

Site No.	Description of Location	Lot & DP Number
1	Towards the northern extent of Belgenny Oval	Lot 47 DP29126
2	Adjoining the rear of 2 -4 Hawkey Crescent	Lot 64 DP29251
3	Adjoining 2A Macquarie Avenue	Lot 224 DP809954
4	Chellaston Reserve Playground	Lot 58 DP17988 & Lot 57 DP239467
5	Southern end of Cowpasture Reserve	Lot 1 DP570803
6	North of Argyle Street bridge – east bank	Null

Figure 1-2 Location of Six Erosion Sites Along the Nepean River



2 Project Proposal

2.1 Description of Proposed Works

Camden Council has engaged Soil Conservation Services to prepare design documentation for the stabilisation of a six erosion sites along the Nepean River at Camden. The location of the erosion sites is shown in **Figure 1-2**.

The stabilisation of the river bank at the sites will include in the installation of logs, rock revetment and revegetation of the river bank slope. The details and configuration of the works will vary between the individual sites. Drawings showing the proposed works are provided in **Appendix A**.

The project seeks to stabilise erosion points located along the Nepean River and undertake associated weed removal and replanting of local native species. The project is consistent with the delivery of Council's *Connecting Camden Community Strategic Plan 2022 – 2036*, which seeks to provide sustainable and responsible solutions that enhance the natural environment. This includes LB2.2 to enhance town centres and public spaces, B1.1 to invest in environmental protection, restoration and urban greening, and B1.5 to maintain and enhance the natural environment.

The project also aligns with actions identified in Council's Biodiversity Strategy to implement the riparian management recommendations of the Nepean River Biodiversity Corridor Masterplan and actions to undertake bank restoration and stabilisation works at priority erosion points in accordance with *Caring for the Nepean: A Guide for the Camden Community*.

2.2 Consideration of Alternatives and Justification of Proposal

With the design objectives in mind, a number of options were identified. These options are (1) “do nothing”, allowing the river bank to regress, potentially exposing existing infrastructure and facilities to erosion, (2) other bank protection stabilisation solutions that were rejected and (3) implementing the proposed concept options are provided in **Appendix A**.

2.2.1 “Do Nothing”

The first option that has been considered involves doing nothing, leaving the river bank to respond to natural fluvial processes and possibly resulting in further instability and erosion of the bank, particularly during times of flooding. Do nothing is not considered an acceptable outcome, given the amenity and usage of the area adjoining the river.

2.2.2 Alternative Bank Stabilisation Solutions

As part of the concept design development, Council considered alternatives including the placement of gabion baskets and rock revetment. These alternatives were discounted due to potential scour issues.

2.2.3 Rock Protection with Logs

Concept Designs have been developed for the six sites in question. The general design for each site comprises a combination of log/rootballs 3 to 4 metres in length embedded at the water level of the eroded section of river bank. The logs are aligned 45 degrees to the direction of flow, pointing in a downstream direction. An example of the design is shown below in **Figure 2-1**.

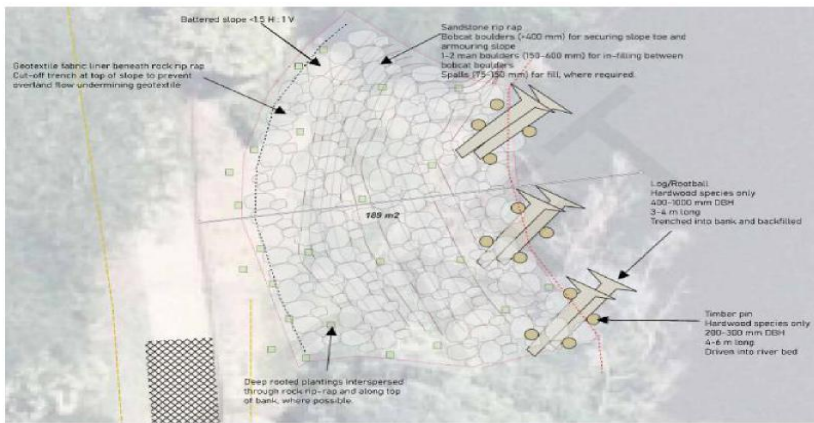


Figure 2-1 Example Design for Stabilisation of River Bank Erosion Sites

The intention is also to plant out the re-established bank with trees and other vegetation.

2.3 Preferred Option

Implementation of the proposed concept design comprising the provision of logs with rock revetment is the preferred option. This is for the following reasons:

- The “do nothing” option is not considered practical or in line with short to medium term usage of the river frontage.
- Other options explored are expected to result in excessive erosion, according to the designers.
- The proposed use of logs has the potential re-use existing flood debris and other materials. It therefore provides a sustainable solution.
- There is the opportunity to replace existing logs as they rot or are displaced following future flood events.

2.4 Construction Methodology

The proposed works methodology would comprise the following stages of construction:

- Site establishment installation of environmental controls including silt curtain
- Protection of trees not to be removed.
- Installation of path protection
- Site Clearing and grubbing
- Supply and installation of logs.
- Construction of ramp to work zone
- Protection of trees to remain
- Identification and removal of Privett and other weeds
- Removal of existing loose fill
- Placement of geotextile underlayer
- Installation of timber pins into embankment
- Placement of rock armor
- Reconstruction of damaged concrete footpaths
- Landscaping and planting
- Tidying up of works

2.4.1 Construction Materials

The main material components of the construction works would be logs/root balls, rock, geotextile and plants. The exact volume of materials is not known.

2.4.2 Plant and Equipment

A range of plant and equipment would be utilised on the project, these would include:

- Small excavator for placement of rock and rootballs
- Small barge to install silt curtain and to place some rock
- Low floatation dump trucks to cart materials to sites from stockpile
- Trucks for delivery of building materials such as rock and geotextile

2.4.3 Contractor Compounds

The following locations are proposed as the compound available for contractors.

- For Sites 1, 2 and 3, the location previously shown below in **Figure 2-2, will no longer be used**. Site Compound will be as shown adjacent to Site 1 instead. The contractor's compound with storage areas and worker facilities is proposed to be located in in Belgenny Reserve off Peter Avenue. The compound must be located outside of any sportsfield. The compound should be located to avoid any damage to trees.
- For Site 4, the compound location is shown below in **Figure 2-3**. The compound is proposed to adjoin the car park in Chellaston Reserve. The compound should be placed to avoid damage trees. It will be necessary to temporarily close the playground for the duration of the works.
- For Site 5, the compound location is shown below in **Figure 2-4**. The compound is proposed to be located towards the southern end of Cowpasture Reserve.
- For Site 6, the compound location is shown in **Figure 2-5**. It will be in the cleared area immediately adjoining the works zone.

All Site compound locations should be confirmed with Council prior to any contractor mobilising to site, ensuring that appropriate consultation occurs with Council's recreation team to ensure there are no conflicts between use of the reserve and playground areas and the proposed works. Impacts and mitigation measures have been considered under the relevant zones of the impact assessment in **Table 5-1**.



Figure 2-2 Contractor Compound Location for Sites 1, 2 and 3



Figure 2-3 Contractor Compound and Associated Features for Site 4



Figure 2-4 Contractor Compound Location for Site 5



Figure 2-5 Contractor Compound Location for Site 6

2.5 Construction Duration/Program

The estimated construction time for the works would be approximately 4 weeks per site. It is assumed sites 1 -3 would be undertaken collectively, with works at sites 4 to 6 mobilised separately.

2.5.1 Working Hours

The following working hours are proposed:

- Monday to Friday 7am to 5pm
- Saturday 7am to 1pm
- No work on Sunday or Public Holidays

2.5.2 Restoration

At the completion of the works the site would be cleared of all surplus materials, temporary fences and the like and restored to not less than the pre-construction condition. A pre-construction dilapidation survey would be used as a basis of assessing the pre-construction condition of the site.

A post-construction dilapidation survey would be undertaken to ensure satisfactory restoration of the site. Any damage to the roads, pathways and other site features would be made good.

3 Planning and Legislative Requirements

3.1 Land Use and Ownership

The land classification of the five sites south of Argyle Street is RE1 – public recreation under the Camden Local Environmental Plan 2010 (refer **Figure 3-1**). Site 6 is located in SP2 – Infrastructure.

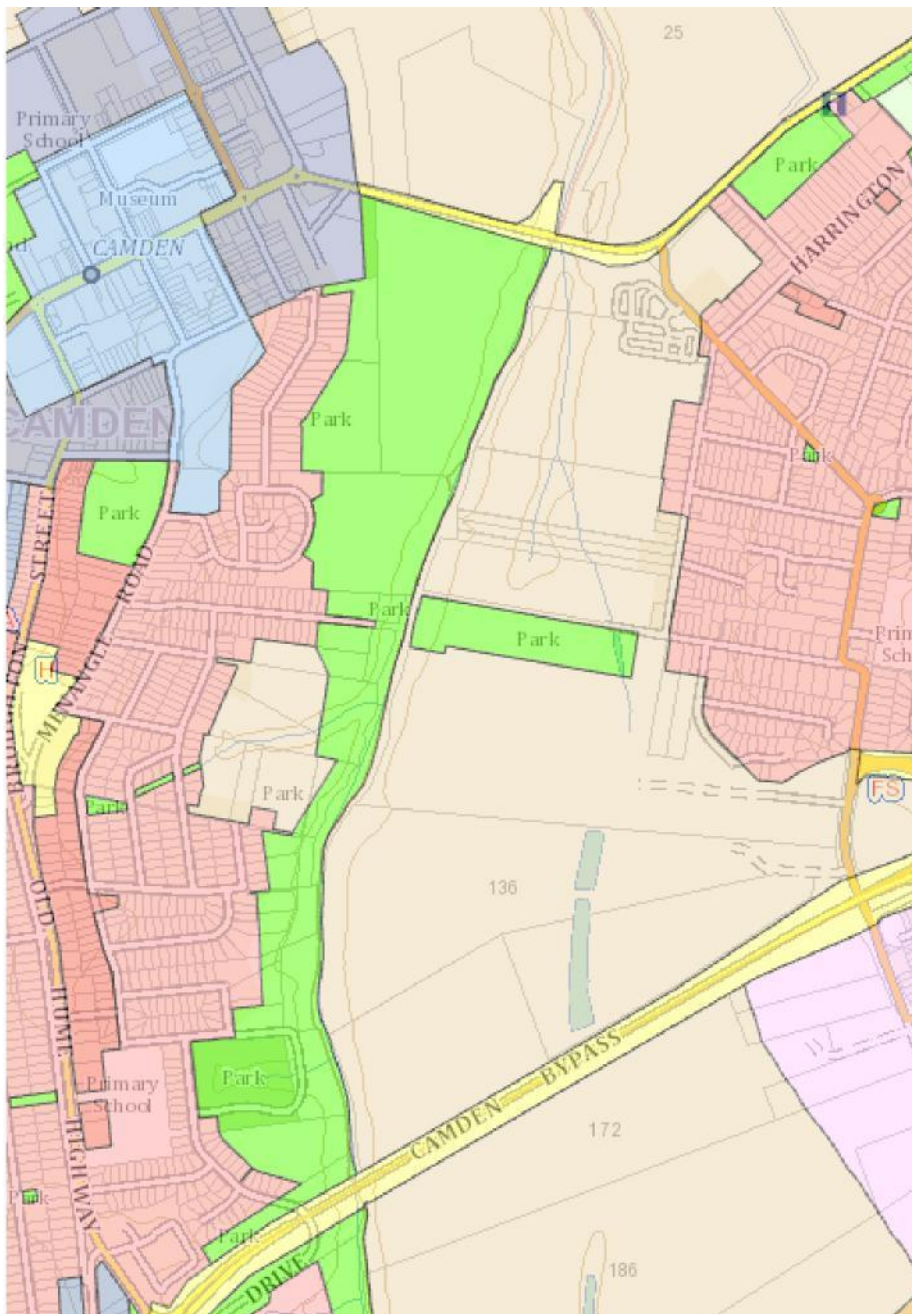


Figure 3-1 Land Use Planning Map

The proposed erosion sites are located on the following lots and with the following zonings as summarised below in **Table 3-1**.

Table 3-1 Summary of Lot Details and Zoning.

Site	Lot/ DP	Zoning
1	Lot 47 DP29126	RE1
2	Lot 64 DP29251	RE1
3	Lot 224 DP809954	RE1
4	Lot 58 DP17988 & Lot 57 DP239467	RE1
5	Lot 1 DP570803	RE1
6	Null	SP2

3.2 NSW Planning and Approvals

The New South Wales (NSW) environmental planning legislative framework provides for the classification of developments, and the assessment of impacts from developments and activities. This framework comprises:

- EP&A Act 1979
- EP&A Regulations 2021
- Environmental Planning Instruments (EPI) made under the EP&A Act (i.e. State Environmental Planning Policies (SEPP), Regional Environmental Plans (REP), and Local Environmental Plans (LEP)); and
- Other planning codes, policies, guidelines and strategies that relate to any proposed development of a site including Development Control Plans (DCP) and Council codes and policies.

The statutory basis for planning and environmental assessment in NSW is set out in the EP&A Act 1979 and the EP&A Regulations 2021.

Part 4 of the EP&A Act sets out the development assessment requirements for those developments that require consent. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by or on behalf of public authorities that are permissible without development consent.

As set out in **Section 3.2.2**, the proposed works fall under Part 5 of the EP&A Act. Under Part 5 of the EP&A Act, the Minister or public authority which is responsible for deciding whether to approve or proceed with an activity (called a “determining authority”) must examine and take into account to the fullest extent possible all matters which are likely to affect the environment if the activity goes ahead (Division 5.1 EP&A Act). As such, the proposed works require the preparation of an Environmental Assessment. The factors to be taken into account in an Environmental Assessment are listed under Clause 171 of the EP&A Regulation.

Where it is identified that an activity under Part 5 of the EP&A Act is likely to significantly affect the environment, threatened species, populations, ecological communities or their habitats, an Environmental Impact Statement (EIS) must be prepared. On the basis of items listed under Clause 171 of the EP&A Regulation, it is considered that the proposed works at the erosion sites are not likely to significantly affect the environment and an EIS is not required. Therefore, the REF contained herein represents the environmental assessment as required under Part 5 of the EP&A Act.

3.2.1 Local government planning and policy

The *Environmental Planning and Assessment Act 1979* is the governing legislation for planning and controlling land uses and development within NSW. Central Coast Council's planning provisions as enabled by this Act include the Camden Local Environmental Plan 2010.

The Camden Local Environmental Plan 2010 has been developed in accordance with NSW Planning and Infrastructure (P&I) to control development via land zonings and other relevant planning provisions.

The objectives of the RE1 zoning the works at Sites 1 to 5 fall within are:

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.

The objectives of the SP2 zoning the works at Site 6 fall within are:

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

The *State Environmental Planning Policy (Transport and Infrastructure) 2021* legislation discussed below overrides the LEP however, it is considered that the proposed stabilisation works fall within the objectives.

3.2.2 State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021

SEPP (Transport and Infrastructure) 2021 aims to facilitate the effective delivery of infrastructure within NSW by public authorities. It does this by prescribing the infrastructure related works that may be undertaken without development consent, although the public authority may still be required to obtain an approval, licence or permit under another Act, such as the Fisheries Management Act 1994.

Division 19 of the SEPP (Transport and Infrastructure) 2021 allows for development for the purpose of soil conservation works may be carried out by or on behalf of a public authority without consent on any land. The works, being for the purpose of halting erosion are consistent with this provision. Therefore, development consent is not required for the works and the works are classified as an activity under Part 5 of the EP&A Act.

3.2.3 Other State legislative and policy requirements

Relevant additional State Legislation that would potentially apply to the proposed works includes the following:

- Protection of the Environment Operations Act 1997 (POEO Act) - Activities should be carried out in a manner which does not result in the pollution of waters.
- Crown Lands Management Act 2016 - To undertake activities on Crown Land, a licence is required from the Department of Industry – Lands (Crown Land). In this instance, the works are on Council Land or in the case of the Nepean River, Crown Land under the care and management of Council. A licence is therefore not required.

- Biodiversity Conservation Act 2017 - The potential impact of the proposal on threatened species has been assessed. The assessment for this REF determined that there is not likely to be a significant effect on threatened species, populations and/or ecological communities listed in the NSW Fisheries Management Act or NSW Biodiversity Conservation Act, or their habitats from the proposed activities. Therefore, a species impact statement is not required.
- Fisheries Management Act 1994 (FM Act) - Permits under Part 7 of the Act are required for dredging and reclamation, temporarily or permanently obstructing fish passage, and harming marine vegetation. As the works involve placement of rock within the waterway, a permit for dredging and reclamation is required under Part 7 of the FM Act is required.
- Water Management Act 2000 – Under the Water Act, approval is required to undertake controlled activities on waterfront land. However, the Water Management Regulation 2011 outlines a number of exemptions for controlled activities. Where a public authority is carrying out the controlled activity on or in waterfront land, approval from the Office of Water is not required.
- National Parks and Wildlife Act 1974- Under the act, consent is required from Heritage NSW for destruction or damage of Aboriginal cultural heritage objects and also outlines whether it's likely that the project will disturb any of these items.

3.2.4 Standards Applying to Construction

The following standards (see **Table 3-2**) would apply to the works themselves in terms of the monitoring and auditing of performance.

Table 3-2 Standards for Monitoring and Auditing of Construction Performance

Item	Regulation
Water	<i>Protection of the Environment Operations Act 1997</i> <i>Protection of the Environment Operations (General) Regulation 2009</i> ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.
Soil Erosion and Sediment Control	Soil and Water Management for Urban Development' (NSW Department of Housing, 1993). 'Urban Erosion Sediment Control' (Department of Conservation and Land Management, 1992). Soil Erosion and Sediment Control – Engineering Guidelines for Construction sites - Institution of Engineers 1996. Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004)
Air	<i>Protection of the Environment Operations Act 1997</i> <i>Protection of the Environment Operations (General) Regulation 2009</i> AS3580 Methods of Sampling and Analysis of Ambient Air.
Noise and Vibration	<i>Protection of the Environment Operations Act 1997</i> <i>Protection of the Environment Operations (General) Regulation 2009</i> NSW EPA Noise Manual

Item	Regulation
	AS1055.1 and AS1055.2 Acoustics - Description and Management of Environmental Noise. AS2436 Guide to Noise Control on Construction, Maintenance and Demolition sites. AS2659.1 Guide to the Use of Sound Measuring Equipment. AS2659 Sound Level Meters.
Flora and Fauna	<i>Biodiversity Conservation Act 2017</i> <i>Fisheries Management Act 1994</i>
Cultural Heritage	<i>Heritage Act 1977</i> <i>Heritage Regulations 2012</i>
Dangerous Goods	<i>Dangerous Goods Act 2008</i> <i>Dangerous Goods (General) Regulation 2014</i> <i>Environmentally Hazardous Chemicals Act 2017</i> <i>Environmentally Hazardous Chemicals Regulation 1994</i> AS1216 Classification, Hazard Identification and Information Systems for Dangerous Goods. AS1678 Emergency Procedure Guides - Transport AS1940 Storage and Handling of Flammable and Combustible Liquids. AS2508 Safe Storage and Handling Information Cards for Hazardous Materials. AS2809 Road Tank Vehicles for Dangerous Goods. AS2931 Selection and Use of Emergency Procedure Guides for Transport of Dangerous Goods.

3.3 Commonwealth Legislation

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) requires that proposals **for development or “actions” that have, will have, or are likely to have, a significant impact** on any matter of national environmental significance are to be referred to the Commonwealth Environment Minister for consideration and approval.

The EPBC Act identifies the following matters of national environmental significance:

- World heritage.
- National heritage.
- Wetlands of international importance.
- Listed threatened species and communities.
- Listed migratory species.
- Protection of the environment from nuclear actions, and
- Marine environment.

The proposed works would not have a significant impact on any of the above, therefore, referral to the Federal Minister for approval is not required.

3.4 Consultation

No formal consultation has been deemed necessary as part of the REF. A Fisheries permit will be required as part of the proposed works.

A communications plan has been prepared for this project to ensure that nearby residents and users of the shared pathway and sporting fields are provided with information prior to the project commencement, and that timing of the works can be managed to minimise impacts on the community.

A direct point of contact will be provided in all communications to ensure that community members can seek further information or have any concerns or questions addressed.

The communications plan includes the use of temporary signage at the project locations, development of a fact sheet for nearby residents and sporting groups, and provision of information on Council's website and social media channels.

Camden Council has advised that internal consultation has also been undertaken during the planning of the project, including consultation with:

Team Leader Major Projects

- Team Leader Sport and Community Facilities Planning
- Manager Open Space and Sustainability
- Natural Resources Officer
- Team Leader Open Spaces
- Team Leader Floodplain Management
- Communications Advisor

4 Environmental Assessment

This section considers the existing site conditions and the potential impacts for those environmental sensitivities considered relevant at the site. Mitigation and control measures are provided for both construction and operational phases in **Section 5** and **Table 5-1**.

4.1 Initial Overview of Site and Impacts

The sites of the proposed stabilisation works are limited to six locations of riverbank of varying length with a contractor compound located as described in **Section 2.4.3**. The works would have discrete and localised environmental impacts, with potential effects upon:

- a. Hydrodynamics
- b. Soils and Geology
- c. Water quality
- d. Ecology
- e. Visual quality
- f. Noise levels
- g. Air Quality
- h. Waste levels
- i. Traffic
- j. Public access, use and safety
- k. Heritage and archaeology

4.2 Hydrodynamics

4.2.1 Site Conditions

The Nepean River has its headwaters near Robertson, about 100 kilometres south of Sydney. The river flows north in an unpopulated water catchment area into Nepean Reservoir. From the dam, the river continues to flow north and forms the western edge of Sydney, flowing past the town of Camden.

Water level conditions in the Nepean River at between the Camden Bypass and Argyle Street are governed by catchment rainfall and release from dams in the upper Nepean system including Cataract, Cordeaux, Nepean and Avon dams. The Nepean River is subject to flooding. Hydraulic modelling to define the existing hydraulic regime has been undertaken for the river reach. As the works proposed are intended to replace the existing bank, an impact assessment has not been undertaken.

4.2.2 Potential Impacts

As the works reinstate the existing bank to at or near the condition pre-failure, the impacts to hydrodynamics of the river are taken to be negligible.

There is the potential for the construction works to be affected should flooding occur during the construction of the stabilization structures. Potential mitigation measures to manage the impact of flooding during construction are outlined in **Section 5.2**.

4.3 Soils and Geology

4.3.1 Site Conditions

No geotechnical investigations have been undertaken at the individual sites in question. However, geotechnical investigations were completed by JK Geotechnics for a site at Little Sandy Bridge, which falls within the overall river reach and is taken to provide some representation of the potential sub-soil conditions. The investigations are described below.

The investigations encountered a sandy fill layer of up to 0.9 m (possible fill) overlying alluvial sand and clay down to the limit of the investigation. No observations (visual or odour) indicated the presence of contamination. No potential acid sulfate soils (PASS) was identified at the site. The strata were described as:

- Poorly compacted sandy fill;
- Very loose to loose alluvial sands; and
- Stiff to very stiff alluvial clay.

Based on the investigations and a review of available geological information, the alluvial sand soils are present at the site to a considerable depth, and well beyond the depth of the proposed excavation and rock placement.

4.3.2 Potential Impacts

The sand that will be disturbed during the placement of rock is considered to be uncontaminated and a natural material. In accordance with the principals of waste minimisation, and to reduce the volume of materials required to be imported to site, wherever possible any sand recovered during the works will be reused on site.

There is a risk of erosion of exposed excavations during the works. This will be managed through erosion and sediment controls presented in **Table 5-1**. An example of an erosion and sediment control plan required for the works, prepared for Sites 1, 2 and 3 is included in **Appendix B**.

The likelihood of any unexpected material or areas of contamination is considered low. However, adoption of mitigation and control measures if this were to eventuate is recommended and these have been identified and presented in **Table 5-1**.

4.4 Water Quality

4.4.1 Site Conditions

The Nepean River is a highly dynamic and naturally turbid environment. Turbidity levels are influenced by river flow and inflows from smaller creeks and tributaries. High turbidity is generally observed during large rainfall events. Water quality at the site would also be influenced by catchment land uses such as agriculture and residential areas.

Overall, it is considered that water quality in the vicinity of the erosion sites is good and not subject to any apparent or known significant contamination issues.

4.4.2 Potential Impacts

There is potential for a short term and localised reduction in water quality due to the disturbance of the riverbank during excavation, placement of new material and stockpiling of materials.

There is potential for waste material from construction activities to enter the surrounding river, including fuel and oil from construction machinery, garbage and waste materials from the works.

Movement and stockpiling of materials could lead to additional sediment entering creek waters if not handled and stored correctly. This would also include material stuck to excavator tracks and moved offsite during transit.

Any water quality issues would be short term and confined to the construction phase only (i.e. approximately four weeks per site). It is anticipated that all of these impacts could be mitigated or avoided through standard construction site good practice, as detailed in the ESCP included in **Appendix B** and presented in **Table 5-1**.

As such, potential impacts on water quality have been assessed as being limited and of low risk.

The completed works are expected to result in improved localised water quality as a result of the reduced potential for scour and erosion of the riverbank. The materials used in the works are essentially inert and should not lead to any water quality concerns in the short-term or long-term.

4.5 Ecology

4.5.1 Site Conditions

In the area of the proposed bank stabilisation works, the landward zone is principally a vegetated riverine corridor extending approximately 50m in width. Behind sites 1 to 5, a Council reserve of cleared grassed land is located behind the riverine corridor (refer **Figure 4-1**) within which, it is proposed to locate the contractor's work compound. Landward of Site 6 is a narrow zone of vegetation, followed by farmland (refer **Figure 4-2**).

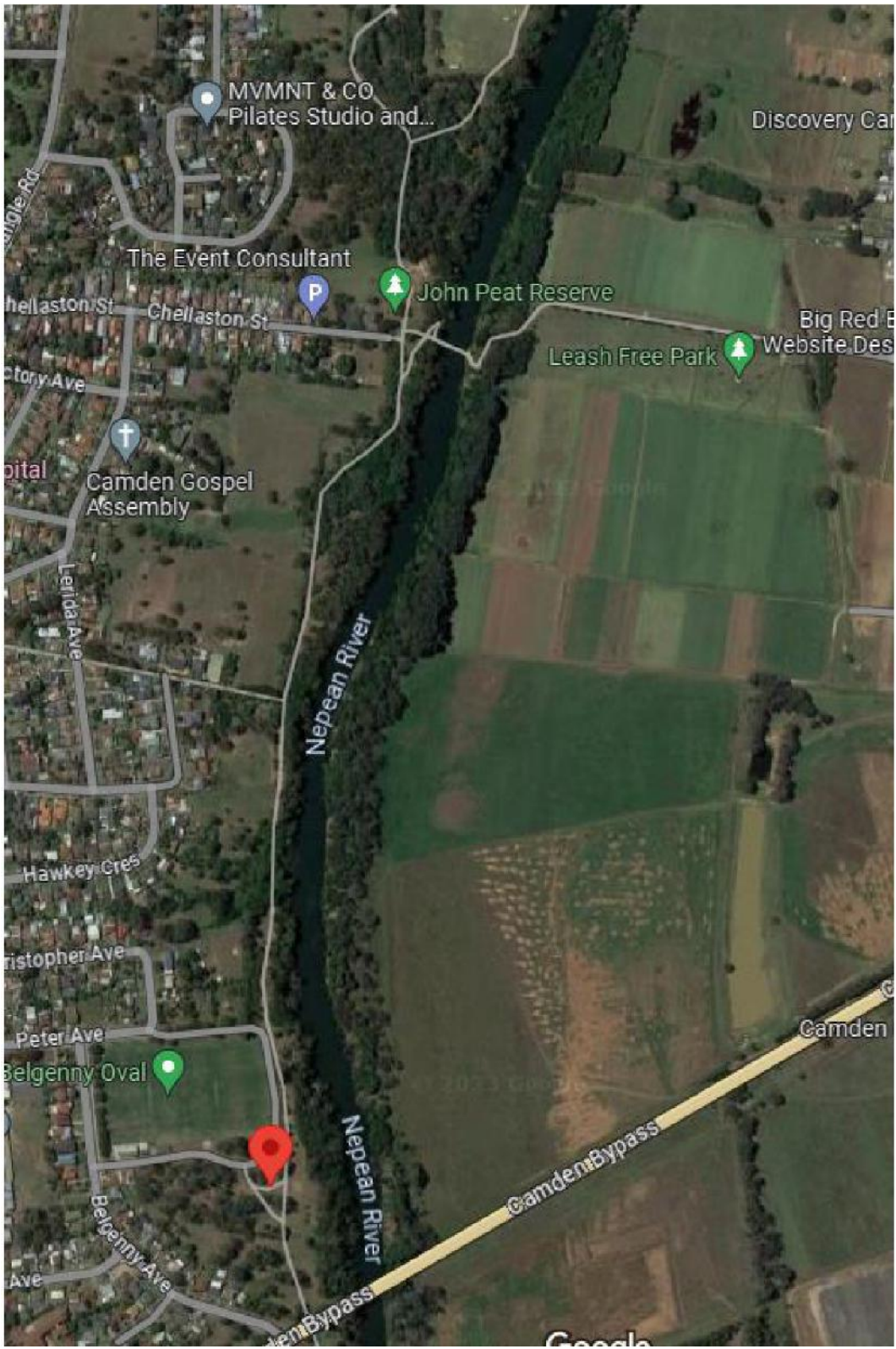


Figure 4-1 Vegetated riverine corridor on the western bank



Figure 4-2 Vegetated riverine corridor on the eastern bank near site 6

The riverine vegetation comprises grasses, weeds, small casuarinas and small eucalypts. Taller trees are located towards the top of the bank. An example of the vegetation encountered at two of the sites is shown in **Figure 4-3** and **Figure 4-4**.



Figure 4-3 *Example of vegetation occurring near Site 3*



Figure 4-4 Vegetated riverine corridor on the eastern bank near site 1

The forest in the vicinity of the erosion sites is considered to be in a disturbed and degraded condition. No aquatic vegetation was observed in the waterway. A number of dead branches were observed upstream and downstream of the works, some partly in the waterway.

Vegetation mapping describes the riverine corridor as Riparian Forest/Woody Weeds and Riparian Forest (DCP 2019) (refer **Figure 4-5**).

At each site there are some native species that have been recorded as per the Vegetation List set out in **Appendix C**. Native species are small, having regenerated since the sites slumped. The dominant weeds species have been recorded and as noted all sites are comprised of a very small component and small number of native species.

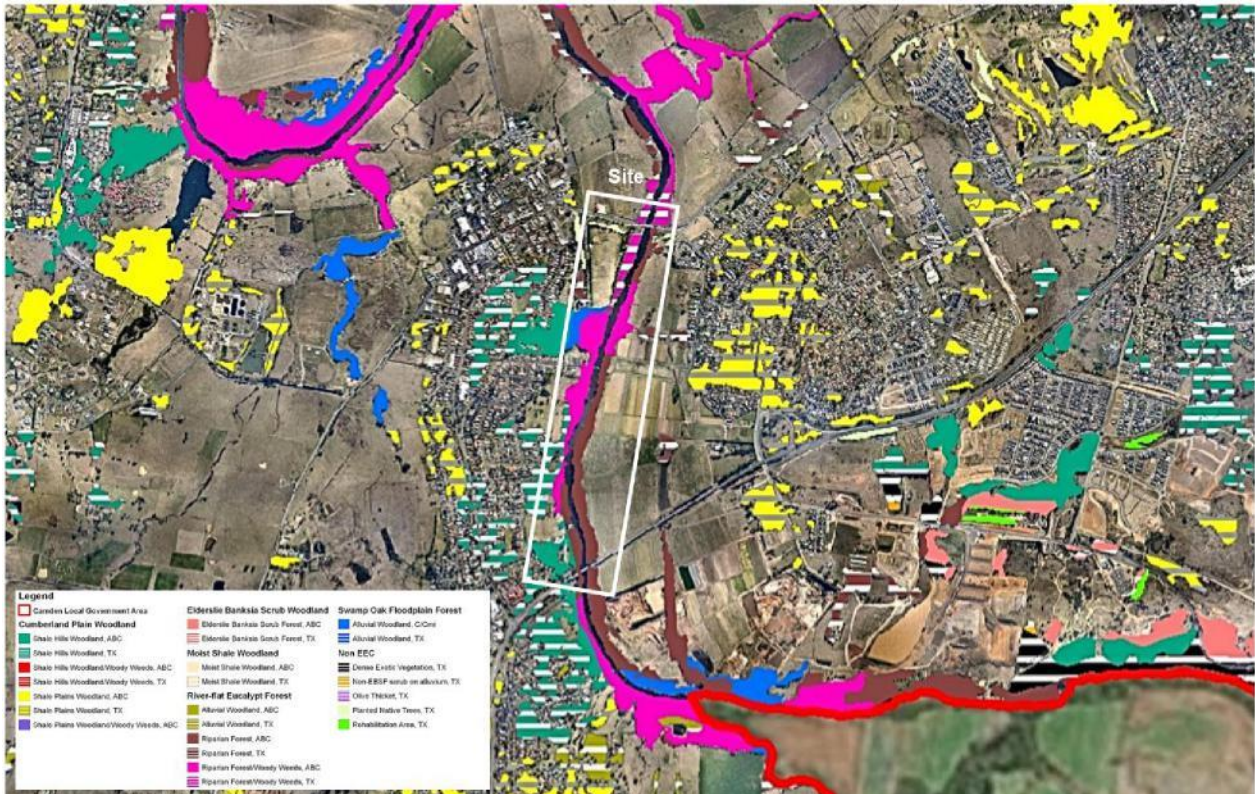


Figure 4-5 DCP 2019 Environmentally Sensitive Land

One of the objectives of the *Fisheries Management Act 1994* is to 'conserve key fish habitats'. Key Fish Habitats have been mapped throughout NSW and are defined to include all marine and estuarine habitats up to highest astronomical tide level (that reached by 'king' tides) and most permanent and semi-permanent freshwater habitats including rivers, creeks, lakes, lagoons, billabongs, weir pools and impoundments up to the top of the bank. The Nepean River at Camden is classified as a Key Fish Habitat (DPI, 2007).

A desktop study has also been undertaken of available information and included searches of several online databases:

- *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (<http://www.environment.gov.au/erin/ert/epbc/index.html>); and
- NSW Atlas of NSW Wildlife database (<http://www.bionet.nsw.gov.au/>);
- Office of Environment and Heritage (OEH) Threatened Species Database (<http://www.environment.nsw.gov.au/threatenedspeciesapp/>).

4.5.1.1 State Vegetation Mapping

The State Vegetation Type Map (SVTM) is a regional-scale map of each of the three levels of the NSW vegetation classification hierarchy. It maps the distribution of each Plant Community Type (PCT), Vegetation Class and Vegetation Formation, across all tenures in NSW. PCTs represent the finest level of a hierarchy applied to the classification and description of native vegetation across NSW. Revised PCTs for eastern NSW were viewed via the SEED Portal and indicated the presence of Cumberland Bangalay x Blue Gum Riverflat Forest (PCT ID: 3145) and Cumberland Blue Box Riverflat Forest (PCT ID: 4024). The map is displayed below in figure **Figure 4-6**.

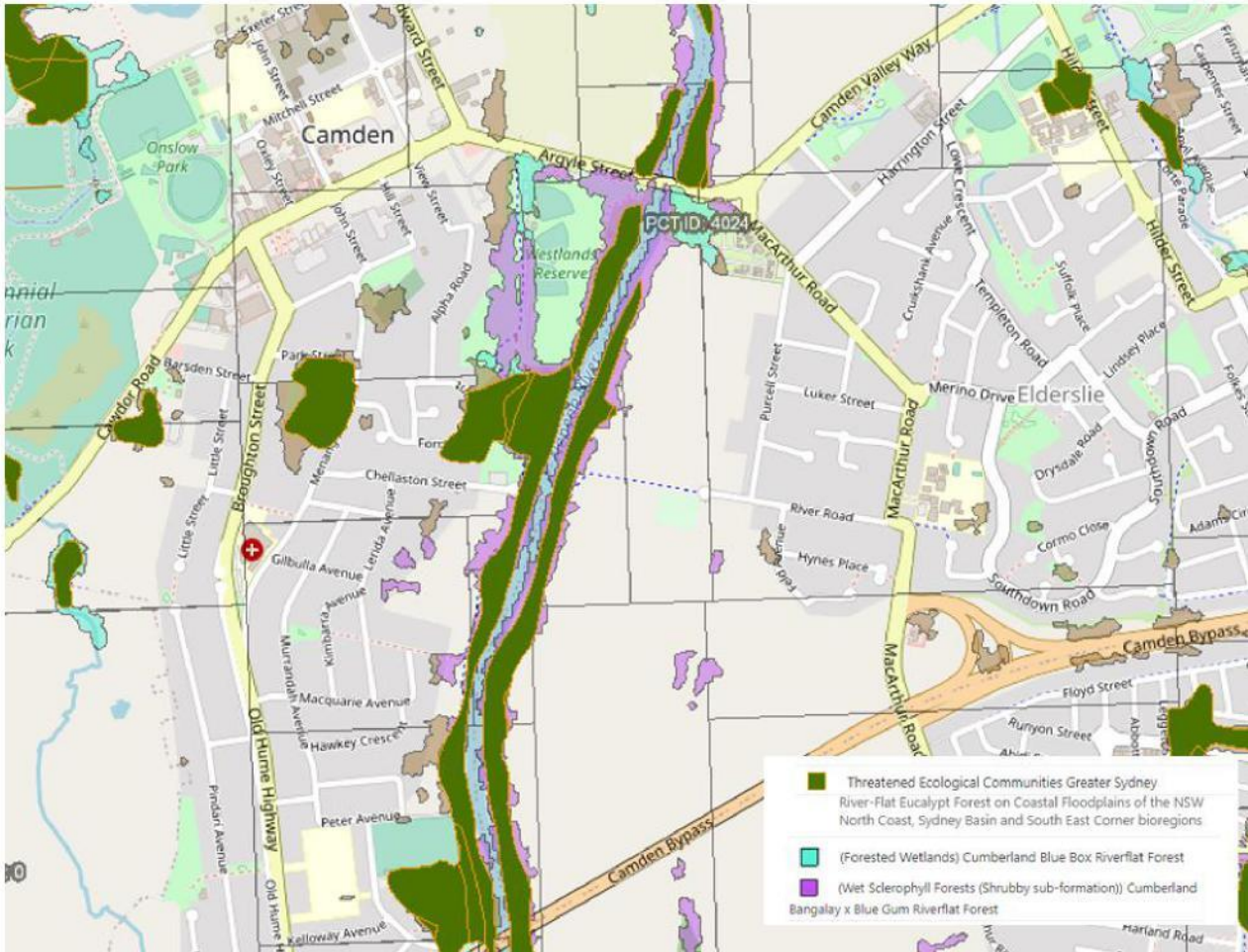


Figure 4-6 State Vegetation Type Map

4.5.1.2 Biodiversity Values

The Biodiversity Values Map identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing. The BV Map is one of the triggers for determining whether the Biodiversity Offset Scheme (BOS) applies to a clearing or development proposal, however for Part 5 activities, an activity is “likely to significantly affect threatened species” if it is carried out in an area of outstanding biodiversity value or likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3 of the Biodiversity Conservation Act 2016 which will be included in **Section 4.5.1.4** below. Because the test shows that no threatened species are significantly impacted the biodiversity offset scheme threshold trigger does not apply.

Council may voluntarily opt into the BOS and a Biodiversity Development Assessment Report (BDAR) would need to be prepared under this scenario. Below (**Figure 4-7**) is the mapping output of biodiversity values across the site.

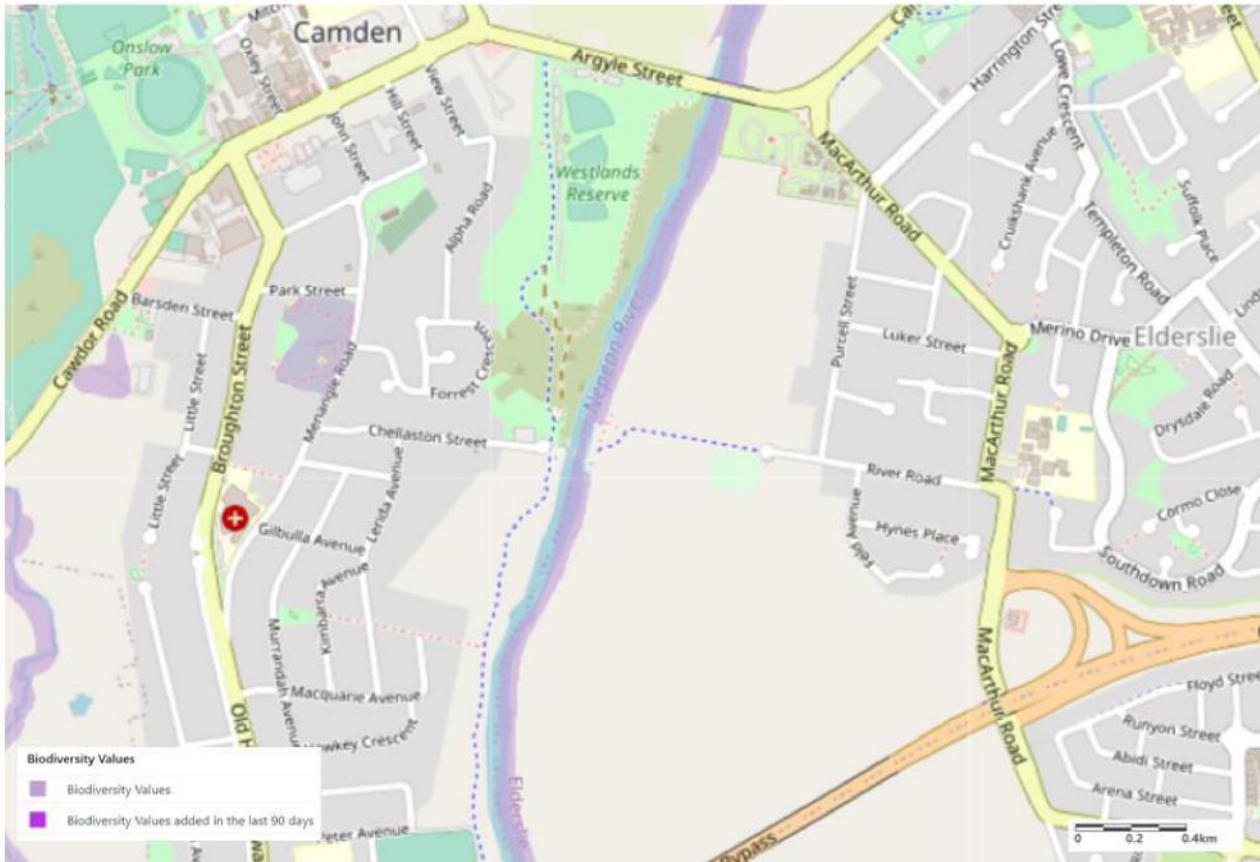


Figure 4-7 Biodiversity Values Map (SEED Portal, 2023)

4.5.1.3 Threatened Species Search

As per NSW Bionet Species Sightings and Threatened biodiversity profile search, vegetation sightings are further described as Camden White Gum listed in NSW as 'critically endangered' and commonwealth listed as 'vulnerable'.

The EPBC Act Protected Matters Search Tool identified 45 threatened and 14 migratory species likely to occur within a 1 km radius of the sites in question. The NSW Wildlife Atlas search also revealed an extensive list of plant and animal species that are known or predicted to occur in the search area and are listed as threatened under the Biodiversity Conservation Act or the EPBC Act (refer **Figure 4-8**). Both reports have been collated and attached in **Appendix C**.

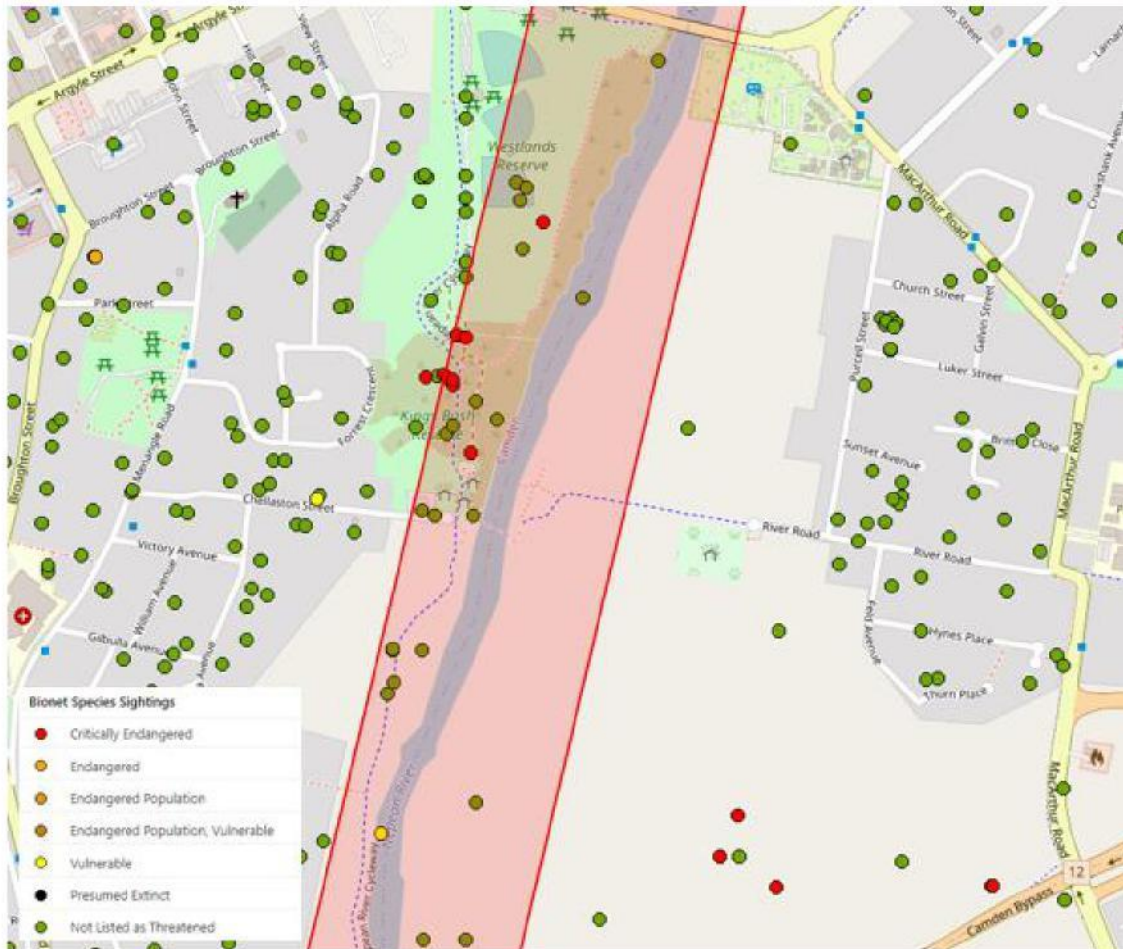


Figure 4-8 NSW Bionet Species Sightings

All critically endangered species occurring in Nepean River were plant species such as the Camden White Gum (*Eucalyptus benthamii*) and the Mountain Cedar Wattle (*Acacia elata*). All other species (faunal or floral) in the direct site were not listed as threatened. Nearby (but not in the direct site) vulnerable and/or endangered faunal species of note were the Powerful Owl (*Ninox strenua*), Swift Parrot (*Lathamus discolor*), Curlew Sandpiper (*Calidris ferruginea*) and the Regent Honeyeater (*Anthochaera phrygia*) which contain details of each below:

Powerful Owl (*Ninox strenua*) – Vulnerable (NSW Status)

The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest and requires large tracts of forest or woodland. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. The Powerful Owl was identified as vulnerable in NSW under the Biodiversity Conservation Act and is known to occur nearby Nepean River but not in the direct site. The Powerful Owl is known to roost in dense vegetation; thus, they may nest and roost in very close proximity and should be noted.

The Powerful Owl is known to roost in dense vegetation, and nest in close proximity. The closest known breeding pair is located at Elizabeth Macarthur Reserve and they have been observed breeding and roosting during Spring. No Powerful Owls are identified at the construction sites or the immediate locality and are unlikely to be breeding or roosting at these construction sites given the proximity to Elizabeth Macarthur Reserve and the requirement that Powerful Owls require a large habitat. If Powerful Owls are

sighted at the construction sites or adjacent vegetation, a buffer zone of 100 metres is required around breeding / roosting Powerful Owl.

Swift Parrot (*Lathamus discolor*) – Critically Endangered (Commonwealth Status)

The Swift Parrot migrates to the Australian south-east mainland between February and October and occur only where eucalypts are profusely flowering or where there is an abundant lerp (from sap-sucking bugs) infestation. The Swift Parrot forages sites on a cyclic basis depending on food availability and specifically favours certain tree species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculate*), Red Bloodwood (*C. gummifera*) and Forest Red (Gum *E. tereticornis*). Based on the site description, the typical habitat for a Swift Parrot is not present therefore the species is unlikely to be impacted by the works.

Curlew Sandpiper (*Calidris ferruginea*) – Critically Endangered (Commonwealth Status)

The Curlew Sandpiper is a small migratory bird that breeds in Siberia and migrates to Australia for the non-breeding period, between August and November, and departing between March and mid-April. It generally occupies littoral and estuarine habitats, and in NSW is mainly found in intertidal mudflats of sheltered coasts. It roosts on shingle, shell, or sand beaches; spits or islets on the coast or in wetlands; or sometimes in salt marsh, among beach-cast seaweed, or on rocky shores. The chance of Curlew Sandpiper's to reside in the site area is quite low, due to its migratory behaviour, unique breeding location and lack of roosting grounds. Therefore, the proposed works are unlikely to impact the Curlew Sandpiper.

The Regent Honeyeater (*Anthochaera Phrygia*) – Critically Endangered (Commonwealth Status)

The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia, and only breeds in 3 key locations - north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Considering the lack of available feeding sources and particular breeding grounds, the chance of encountering the Regent Honeyeater during works is low.

Many of these species are unlikely to occur at the site, only nearby in a 10kmx10km radius. None of the species are considered likely to be impacted as a result of the works. If fauna species are observed to persistently occupy areas in the immediate vicinity of work zones, the contractor is to cease work activities and notify Council. It is the contractor's responsibility to also inform workers of their obligations and possible offences under the NSW National Parks and Wildlife Act and Australian EPBC Act with respect to threatened and migratory species. See **Table 5-1** for the comprehensive list of mitigation measures if species are found at the site.

Notwithstanding these extensive lists of species potentially occurring in the vicinity of the erosion sites, it should be noted that the foreshore and riverbed is a modified environment due to past construction at the site, is subject to ongoing erosion, and it is unlikely to provide habitat for threatened species. These species will be addressed in the test of significance below.

4.5.1.4 Test of Significance

Assessment Provision: (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction [BC Act section 7(1)(a)]

Response: The works are at sites that are primarily disturbed riverbanks comprised mostly by weed species, with a small number of native species that have regenerated since the sites slumped. An assessment of each species against this criteria is as follows:

- The site represents habitat that may be utilised by the powerful owl for hunting and/or roosting. However the scale of the works will not impact the species to the point where it will become extinct locally;
- The swift parrot is unlikely to use the area due to lack of food species;
- The curlew sand piper is unlikely to use the area due to most feeding and roosting for the species occurs in or around intertidal flats, which are not present at site; and
- The regent honeyeater is unlikely to be impacted due to a lack of food species in the area

Assessment Provision: *(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction [BC Act section 7(1)(b)]*

Response: The Endangered Ecological Community (EEC) "River-flat Eucalypt Forest" with interspersed woody weed vegetation community occurs along the Nepean River in the locality of the sites. At the construction sites which are highly disturbed, the is best described as exotic vegetation / woody weeds. Therefore no adverse effect on the EEC "River-flat Eucalypt Forest" (RFEF) is likely or will the composition RFEF be substantially or adversely modified that its local occurrence is likely to be placed at risk of extinction. The works will not impact on adjoining vegetation that may comprise component of RFEF. Temporary protective fencing will be installed to protect adjoining vegetation.

Assessment Provision: *(c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*

Response: The scale of the works is small with minimal removal of vegetation, the works will not alter the habitat in a negative way, and may increase habit value by lessening erosion in the area.

Assessment Provision: *(c) in relation to the habitat of a threatened species or ecological community: (ii) 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 [BC Act section 7(1)(c)]*

Response: The habitat to be removed offers some refuge for but minimal habitat value. Clearing of these areas would have minimal impact on the species utilising the area.

Assessment Provision: *(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly) [BC Act section 7(1)(d)]*

Response: There are no declared areas within the site nor within close proximity to the site. It is therefore unlikely that the works will impact on any declared area of outstanding biodiversity value.

Assessment Provision: (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process [BC Act section 7(1)(e)]

Response: Clearing of native vegetation are listed as a key threatening processes within the TSC Act. Clearing of native vegetation would be minimal and restricted to the immediate area of the works, as such, the impacts from these activities are considered to be minimal. Mitigation measures in the form of rehabilitation planning would encourage the regeneration vegetation on the site once works are completed.

Summary: The proposed development would not affect critical habitat and there is unlikely to be a significant impact on threatened species, populations or ecological communities or their habitat. The activity associated with the proposed development may cause some localised disturbance to the community present on this land but it is not considered significant.

4.5.2 Potential Impacts

The proposed works are expected to cause limited to negligible impacts on ecology. The works would be undertaken almost entirely from the top of the bank and adjacent grassy areas. The proposal may require the removal of some exotic ground covers and grasses on the banks. A small area of Privet may be required to be removed to allow a construction ramp to be installed for access for works to be undertaken.

As a result of recent floods, in particular May 2024, the river embankment have become more eroded and unstable. As a result, there are two semi-mature Eucalypts that may be required during the installation of the construction access ramps at Sites 2 and 3. These trees (*Eucalyptus terreticornis* and *eugenoides*). These trees may have been part of planting works previously undertaken for site rehabilitation at these sites.

Council will undertake vegetation regeneration in the immediate area. Any vegetation removal will be supervised by Council's Natural Resource Officer.

The construction activities may result in minor disturbances to the bed sediments and result in a temporary reduction in water quality. However, impacts to riverine species and the river environment would be short term and localised. A silt curtain would be used at the site as shown in the erosion and sediment control plan (ESCP) included in **Appendix B** and presented in **Table 5-1**.

Temporary noise disturbances to fauna may also occur as a result of the works, although any impact would be minor in the context of typical activities undertaken in an urban area. In addition, the capacity for mobile fauna to relocate would minimise the potential for any disturbances to these species.

No snags will be removed from within the waterway and there will be no obstruction to the free passage of fish. The installation of the proposed logs may result in a minor improvement to the fish habitat.

The use of appropriate mitigation and control measures to avoid and ameliorate any impacts on ecology are recommended and these have been identified and presented in **Table 5-1**.

4.5.3 Consideration of Wombat and Platypus Habitat

The proposed sites are locations where erosion has occurred and the river bank has been washed away. From inspections carried out by Council staff, there is no evident of wombat dens or platypus burrows. Camden Council has recently received advice from a local resident that they have sighted a koala along the Nepean River in the locality of South Camden. The sighting is outside of the location of the proposed works. It has not been substantiated through site visits by Council staff and has not been identified on the Bionet Atlas. Options to monitor for the presence of wombats, platypus and koalas are summarised in **Table 5-1**.

4.6 Visual Impacts

4.6.1 Site Conditions

The sites in question are used primarily for recreation and is situated in a bushland setting along a river. The eroded river bank sites is not visible from nearby properties on the same bank. However, they are visible from the river and potentially from properties on the opposite bank.

Floodplains along the Nepean River at Camden are identified within the Camden DCP (S2.16.9) as a culturally significant landscape. The project will act to ensure the protection of the existing landscape values by undertaking bank stabilisation and protection works to prevent the further erosion and damage to the bank and surrounding areas.

4.6.2 Potential Impacts

The works are expected to cause minimal and temporary impact on the visual amenity of the sites and adjacent areas during construction. Impacts would be in the form of earthworks, the presence of vehicles, plant, equipment, stockpiles and the potential for increased turbidity in the river adjacent to the site.

Construction of the rock revetments will change the eroded shoreline to a uniform rocky foreshore improving the amenity of the site. Although the proposed works will change the aesthetics of the site, the finished revetment will protect the site from further erosion increasing its visual amenity. Planting between the revetment will reduce the visual impact in the long term.

4.7 Noise

4.7.1 Site Conditions

The sites are located along the Nepean River in the historic town of Camden. There are however no residential or commercial dwellings immediately adjacent to the site. The closest receivers are typically around 100 metres from any of the erosion sites in question.

Overall, given that the site is mostly a recreational area in a bushland setting along a river, the background noise levels are considered to be low.

4.7.2 Potential Impacts

Construction activity on site would be undertaken during the following normal working hours, in accordance with the Interim Construction Noise Guideline (DECC, 2009):

- Monday to Friday 7am to 5pm
- Saturday 7am to 1pm
- No work on Sundays or Public Holidays

Any variation to the above hours would require the approval of Council, which would only be considered having regard to any potential for noise impacts on the surrounding recreational area and nearby residential amenity.

The proposed construction activities would involve excavation, concreting and rock placement. Excavation would be in sandy soils and there would be no excavation into bedrock involving use of rock

hammers, for example. Other construction activities would be consistent with those commonly encountered on residential and commercial building sites.

Although the existing background noise level at the site are considered to be low, no significant noise impacts would be expected due to the works.

The receptors most likely to be affected are the residences along Chellaston Street.

Whilst there is no avoiding noise impacts at construction sites, there are standard construction good practice noise safeguards and mitigation measures that would be expected on site, as outlined in **Section 5** and **Table 5-1**. With those measures in place it is anticipated that noise impacts during this the works would be acceptable to local receptors given their temporary nature and the necessary requirement for the works.

There would be no impact on noise levels during the operational phase of the works.

4.8 Air Quality

4.8.1 Site Conditions

Existing air quality at the sites is presumed to have low levels of pollutants, such as particulate matter and oxides, owing to its location away from major industrial and/or commercial areas. A Regional Air Quality Index is calculated by DPIE at Camden and is generally rated as either 'Good' or 'Very 'Good'.

4.8.2 Potential Impacts

Excavation and rock placement as well as the transport and/or delivery of rock material to individual sites may result in the localised, temporary generation of dust. Truck movements may also result in dust generation across the sites. It is expected that any potential air quality impacts would be effectively mitigated through the control measures listed in **Table 5-1**.

4.9 Waste Management

4.9.1 Site Conditions

Waste inputs in this area would most likely be confined to that left by recreational users of the area. Garbage bins are located at Chellaston Reserve on the western bank of the river and are emptied as part of Council's waste collection services.

Overall, the site appears to have very low levels of garbage or waste on it.

4.9.2 Potential Impacts

The proposed works may generate the following waste during construction:

- Excavated fill material unsuitable for reuse, and
- General construction waste.

Materials unsuitable for reuse would be transported off site in accordance with the requirements of the Protection of the Environment Operations Act 1997 (PEO Act). Any imported material on the site including rock and soil should classified as Virgin Excavation Natural Material.

The removal of general construction waste from site is a normal construction contract requirement, progressively and at completion. The scour and erosion protection works once constructed would not generate waste at the site. It is considered that the impacts of the works from waste is negligible. However, it is recommended that standard construction site good practice is adhered to, as detailed in **Table 5-1**.

4.10 Traffic and Parking

4.10.1 Site Conditions

Access to Sites 1 to 3 would be through Belgenny Reserve, via the existing shared path. Access to Site 4 would be from the end of Chellaston Street using the existing shared path for access. Access to Site 5 will be from the north via the service road for Cowpasture Reserve. Access to Site 6 would need to be created off Argyle Street.

4.10.2 Potential Impacts

The Contractor compound would be located in the large, grassed reserve adjacent to the river. During the works, these areas would become inaccessible to the public and other users of the area (refer **Appendix B**).

As noted in **Section 2.3.6**, it is estimated that approximately a large tonnage of rock would need to be imported to site to complete the construction. The rock would be delivered to Sites 1 to 5 via either Peter Street or Chellaston Street. Site 6 would be delivered directly off Argyle Street.

As noted in **Section 2.4**, a small barge may be temporarily used to install the silt curtain at the site and to place some of the sheets / rocks on the riverbank.

The rock would be delivered at a rate to match the rate of construction and the available stockpile area. The only other significant vehicular movements would be those associated with the supply of logs and plants. These vehicular movements would be along main roads and they would not be expected to have any significant impact on traffic. As this site not a main thoroughfare and as the works are temporary, the impacts from the works on traffic and parking are likely to be minor.

It would be a requirement of the construction contract that the Contractor employ persons to control vehicular movements to and from the access road to the erosion sites.

A traffic management plan will be required to coordinate impacts associated with the proposed works on pedestrians and vehicles

4.11 Existing Users, Access and Safety

4.11.1 Site Conditions

The shared user path along the river is primarily for recreational purposes. This includes pedestrians and cyclists. Users may include people utilising Chellaston Reserve or Cowpasture Reserve.

4.11.2 Potential Impacts

At different times during the various stages of the works, the creek bank would be transformed during the construction activity. There would be various items of construction plant on site at different times such as excavators and trucks.

Section of the shared path would need to be closed temporarily during construction of the works. Appropriate safety precautions would be taken during the construction activities, such as incorporation of security fencing and construction barrier fencing, to ensure public and worker safety. It would be a requirement of the construction contract that the Contractor employ persons to control vehicular movements to and from the access road to the site.

In summary, while there will remain the temporary inconvenience to users of the shared path during the construction period, such inconvenience is considered acceptable to attain the necessary longer term benefits of the scour and erosion protection works.

Following construction of the scour and erosion protection works, there would be no ongoing adverse impacts to users of the bridge and its approaches.

4.12 Heritage and Archaeology

4.12.1 Site Conditions

The EPBC Act Protected Matters Search Tool identified no Commonwealth Heritage Places or National Heritage Places.

There are no Aboriginal places near the site declared under Section 84 of the NP&W Act.

A search of the Council LEP and State Heritage Register confirms numerous items listed for the Camden LGA due to the historic nature of the town Camden. However, no sites were identified in the vicinity of the proposed works.

An Aboriginal Heritage Information Management System (AHIMS) search was conducted. This identified no sites within the area. A copy of the AHIMS search is provided in **Appendix D**.

4.12.2 Potential Impacts

No Aboriginal heritage constraints were identified for the works and no further investigation or impact assessment is required.

The Aboriginal Objects Due Diligence Code states that where a desktop and visual inspection has occurred and concluded that Aboriginal objects are unlikely to occur, an Aboriginal Heritage Impact Permit (AHIP) application will not be necessary. The works may therefore proceed with caution without a further Aboriginal Cultural Heritage Assessment (ACHA) or AHIP.

It is unlikely that there are any unrecorded non-indigenous artefacts within the sites in question as it is a natural river bank.

Nevertheless, the control measures listed in **Table 5-1** are recommended to ensure that no heritage impacts occur due to the proposed works.

5 Recommended Mitigation and Control Measures

5.1 Environmental Management Plan

A site-specific construction environmental management plan (CEMP) should be prepared by the Contractor and approved by Council prior to commencement of construction. The Contractor would implement the CEMP during the works and would be responsible for selecting appropriate control measures for the potential impacts identified in this REF. The CEMP should be compliant with the contract technical specifications.

The CEMP would ensure that:

- appropriate control measures for the potential impacts are implemented on the site;
- activities are carried out with due diligence; and
- all activities comply with relevant environmental legislation including conditions of approval, Acts and Regulations, and Standards and Best Management Practices.

With the implementation of the CEMP environmental controls there would not be expected to be significant environmental impacts during construction.

5.2 Summary of Environmental Control Measures

The following **Table 5-1** identifies the recommended mitigation and control measures that should be put in place to avoid or ameliorate the potential impacts of the replacement works, as discussed in **Section 4**.

Table 5-1 Proposed Environmental Safeguards and Mitigation Measures

Environmental Safeguard and/or Mitigation Measure
Hydrodynamics
<ol style="list-style-type: none">1. The CEMP should identify available streamflow and rainfall gauges upstream of the area of works and nominate triggers following which plant and material should be moved out of the flood affected area. The contractor should also nominate the flood immunity of any site compound and contingency measures to relocate in the event of flooding.2. The flood immunity of any works or stockpile site should be identified, based on available flood modelling information. Provision should be made to relocate materials in the event of flooding, as much as practical.3. Avoid excessive or long term stockpiling within the flood affected zone.
Water Quality
<ol style="list-style-type: none">4. The Erosion and Sediment Control Plan (ESCP) developed for each site and signed off by Council and the contractor prior to works commencing. The ESCP must be developed and implemented in accordance with managing Urban Stormwater – Soils and Construction. An example ESCP, prepared for Sites 1, 2 and 3 is included for reference in Appendix B. Any additional safeguards required under the Fisheries Permit must also be adhered to.5. Soil erosion and sediment controls should be implemented and maintained in accordance with the requirements of the stormwater management manual <i>Managing Urban Stormwater – Soils and Construction</i> (Landcom, 2004).

Environmental Safeguard and/or Mitigation Measure

6. Topsoil excavation and management should be undertaken in line with the Contract Technical Specification.
7. A schedule should be developed for the orderly excavation of material, which minimises the amount of land that is disturbed at any one time and minimises the potential for erosion and sediment transport and is consistent with efficient construction operations.
8. Stockpiles of excavated material should be located on flat ground at least 20 m away from areas subject to run-off and away from established flowpaths. The height of the stockpiles shall not exceed 2 m, unless stockpiles are suitably protected from wind erosion. The Contractor shall protect temporary topsoil stockpiles with diversion drains, silt fences and straw bales to prevent sediment loss.
9. A silt curtain should be installed in the river around the work site to minimise the release of turbid waters into the adjacent waterways. The curtain is to be installed, prior to commencement of any instream works and retained until after the completion of works.
10. Prior to use at the site and / or entry into the waterway, machinery is to be appropriately cleaned, degreased and serviced.
11. Refuelling should be undertaken off site. However, if refuelling on site is required, due care shall be taken to avoid spilling fuel and a tray should be used to catch any accidentally spilt fuel. Plant refuelling/servicing activities to be completed on-land and away from waterway areas.
12. The Contractor should undertake regular inspection of site controls and ensure that all plant and equipment is maintained in good working order with regular servicing.
13. Spill response kits should be maintained onsite for use as required by trained Contractor personnel.
14. No major maintenance of equipment should be undertaken on-site.
15. Timing of works should be planned to avoid, where possible, periods of high rainfall or during storm/wind warnings. Where this is not possible, preparation and tidying should occur around the worksite to reduce the potential for contamination of the waterway from stormwater runoff.
16. Weather forecasts need to be checked regularly during construction. Where flooding or inundation is forecast to the any work area, all equipment and materials need to be removed from the waterway and landside construction zone or appropriately secured above expected flood levels in the area.
17. Tracking of sediment from the construction site via construction equipment onto the road should be minimised. This may include cleaning any machinery in a designated washdown area to prevent tracking of soil off site.
18. The lowest level of hydrocarbons (oil, grease, petrol, diesel) practicable should be stored on site. If storage on-site of hazardous substances is required, then effective bunding should be used.
19. Appropriate site and project inductions/training detailing potential water quality impacts and relevant construction measures and spill and emergency response procedures should be used.

Air Quality

20. A suitable water tanker should be employed to maintain access roads/tracks and haul roads in a damp condition.

Environmental Safeguard and/or Mitigation Measure

21. All trafficable areas that are not sealed should be routinely watered to suppress the formation of dust. Water carts should be provided for routine watering except during wet weather.

Landscape and Visual

22. Impacted areas (i.e. for access, storage and site works) should be returned to pre-construction conditions where possible.
23. All plant and equipment should be kept to a minimal area and be retained within the site compound outside of construction hours (excluding any water bound plant and equipment).
24. The construction site should be kept tidy and in an orderly fashion at all times to minimise visual impacts to local residents.

Ecology

25. All construction works must be undertaken by suitably qualified and experienced Contractor(s) to reduce the risk of error and accidental environmental damage.
26. Any trees located in the vicinity of the contractor compound or construction access should be provided with appropriate protection measures.
27. Workers shall be informed of their obligations and possible offences under the NSW National Parks and Wildlife Act and Australian EPBC Act with respect to threatened and migratory species.
28. The Works shall minimise the destruction of flora and interference with fauna.
29. Council Natural Resource officers to supervise any vegetation removal
30. If a Powerful Owl is known to nest and roost in close proximity to the work sites, a buffer zone of 100 metres will be implemented around breeding / roosting Powerful Owl.
31. Vegetation adjacent to the construction sites will be fenced off during construction to afford protection.
32. Prior to construction commencing, an inspection by Council staff should be undertaken to identify if there is any evidence of koalas, wombat dens or platypus burrows in the vicinity of the site, as well as 50 metres in each direction. Koala inspections will be undertaken daily by Council Natural Resource Officer as koalas can be relatively mobile over short periods of time. If there is any evidence then a plan of management for the platypus, wombat, koalas should be developed by a qualified ecologist.
34. During construction, daily checks should be undertaken 50 metres in both directions from site to identify any evidence of wombats or platypus. In the event that either species is identified a plan of management should be developed.
35. When revegetating disturbed soil should be levelled and smoothed and sown with a mixture of sterile grass seeds to encourage rapid revegetation and planted out with native plant species representative of the River-Flat Eucalypt Forest.
36. Contractor to cease work activities and notify Council if fauna species are observed to persistently occupy areas in the immediate vicinity of work zones.
37. If native fauna is injured, immediate contact should be made with a wildlife rescue service or a veterinary surgeon.
38. No snags are to be removed, realigned or relocated in the waterway.

Noise

Environmental Safeguard and/or Mitigation Measure

38. Works should be undertaken during the standard construction hours where practicable (i.e. 7.00 am to 5.00 pm Monday to Friday and 7.00 am to 1.00 pm Saturdays, with no work to be undertaken on Sundays and Public Holidays). However, on occasion works may be required outside of the standard hours to meet the tide conditions and to allow for the works to be delivered on time. Where works are required outside of the standard hours, notification will need to be provided to local residents by Council.
39. Plant to be turned off when not in use (e.g. not left idling).
40. Instructions should be issued to the Contractor that appropriate silencers are to be fitted on all plant and equipment where possible.
41. All residents potentially affected by noise or other environmental issues should be consulted and notified of the scope and duration of the proposed works and potential impacts.
42. The use of horns and alarms are to be minimised.

Traffic Management

43. The Contractor shall coordinate transport to ensure minimum damage to public and other access roads along rock haulage routes.
44. The Contractor shall utilise materials sourced locally wherever possible to limit the use of public roads for long distance hauling of bulk construction materials.
45. The Contractor shall employ persons to control vehicular movements to and from the access road to the site.
46. A traffic management plan, that considers the impacts of construction traffic on the public, including any routes between the compound and the works area should be prepared by a appropriately qualified person. The traffic management plan must also consider management of pedestrians due to the location of works on a high use shared pathway.

Public Access and Safety

47. Prior to commencement of works, boundaries of the construction and access areas need to be marked with temporary barrier fencing. The fencing shall be monitored daily by the site supervisor and immediately repaired or replaced if necessary and shall be removed when construction is completed.
48. Appropriate signage should be installed advising pedestrians and cyclist of any changes to existing walking or cycling infrastructure during the works.
49. Machinery shall only access the defined work sites via clearly defined routes.
50. Pedestrian access near to or within the Works area shall not be permitted over the duration of the Works.
51. Surrounding residences and businesses should be notified of the proposed works and hours of operation.
52. Community to be notified of construction activities and provided with a mechanism (e.g. phone number) for complaints to be submitted.

Waste Management

Environmental Safeguard and/or Mitigation Measure

53. Waste should be managed in accordance with the philosophy of the waste minimisation hierarchy as follows:
 - a) avoidance, where possible;
 - b) treated, as required and reused onsite;
 - c) recycled, either within the site or offsite; and
 - d) where other alternatives are not possible, wastes would be disposed of at appropriately licensed waste management facilities.
54. Excavated material including fill material should be reused where practicable.
55. Any soils designated for offsite disposal would be tested for ASS and, if visual inspection of the soils indicates contamination may be present or the soils differ significantly from the material types observed during the ground investigations, the soils would also be tested for potential contamination, classified, stored, transported, and disposed of at an appropriately licensed waste facility in accordance with the DECC (2008) *Waste Classification Guidelines*.
56. Appropriate training on the management of waste should be provided to all staff onsite.
57. Any temporary stockpiles of waste should be appropriately covered and/or contained (e.g. bunding) to ensure no waste is washed or blown back into the waterway. If materials do enter the river during the work, they should be recovered immediately
58. Washout of trucks and cleaning of equipment and/or vehicles used during the works should not be undertaken in locations that permit flow of untreated wastewater directly to the open drainage system.
59. Portable toilets should be emptied on a regular basis and human waste disposed of to a local sewage treatment plant.
60. Upon completion of the rehabilitation activities, the site should be cleared of all surplus materials and any remaining waste created by the works.

Heritage

61. If any item of potential non-indigenous significance is found during construction, works should stop, and the matter referred to Council. The NSW Heritage Council would then be contacted in accordance with the *Heritage Act 1977*
62. All relevant staff and contractors are to be trained regarding their statutory obligations and responsibilities under the Heritage Act 1977 and best practice outlined in The Burra Charter 2013, through the site induction and toolbox talks in the event suspected historical cultural material is uncovered.
63. In the event that any potential archaeological finds / items are uncovered during construction works, the contractor must notify the Council Project Manager immediately and cease works until further instruction.

6 Summary of Environmental Factors

6.1 Consideration of Factors in Clause 171 of the EP&A Regulation

Clause 171 of the EP&A Regulation 2021 provides a list of factors that must be considered in determining the likely impacts of an activity on the environment.

Following review of the Clause 171 factors outlined below in **Table 6-1**, the proposed works are not considered to result in significant detrimental environmental impacts. Therefore, it is concluded that an EIS is not required and this REF is considered an appropriate environmental assessment.

Table 6-1 Factors in determining the likely impacts of an activity on the environment

Clause 171- Factor	Significant impact
a. Any environmental impact on a community?	No
b. Any transformation of a locality?	No
c. Any environmental impact on the ecosystems of the locality?	No
d. Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	No
e. Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?	No
f. Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?	No
g. Any endangering of any species of animal, plant or other form of life whether living on land, in water or in the air?	No
h. Any long-term effects on the environment?	No
i. Any degradation of the quality of the environment?	No
j. Any risk to the safety of the environment?	No
k. Any reduction in the range of beneficial uses of the environment?	No
l. Any pollution of the environment?	No
m. Any environmental problems associated with the disposal of waste?	No
n. Any increased demands on resources (natural or otherwise) that are or are likely to become in short supply?	No
o. Any cumulative environmental effect with other existing or likely future activities?	No
p. Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	No

6.2 Consideration of Matters of National Environmental Significance

Matters of national environmental significance must be considered under the environmental assessment provisions of the *EPBC Act*. No matters of national environmental significance would be impacted by the proposed works, as set out below in **Table 6-2**.

Table 6-2 Matters of national environmental significance that must be considered

Matter of National Environmental Significance		Impacted?
a.	Any environmental impact on a world heritage property?	No
b.	Any Environmental Impact on a National Heritage place?	No
c.	Any Environmental Impact on Ramsar Wetlands of international importance?	No
d.	Any environmental impact on Commonwealth listed threatened species and ecological communities?	No
e.	Any environmental impact on Commonwealth listed migratory species?	No
f.	Does any part of the project involve a nuclear action?	No
g.	Any environmental impact on the Commonwealth marine environment?	No
h.	Any impact on Commonwealth land?	No

7 Conclusions

Council has requested the design for the proposed scour and erosion protection works at six sites along the Nepean River by the NSW Soil Conservation Service. This REF is a written statement prepared for Council that considers the impact of the proposed works on the natural and built environment, and the proposed methods of mitigating or ameliorating any adverse effects.

The proposed scour and erosion protection works are to be undertaken under Part 5 of the EP&A Act.

Council is the consent authority for the works and a Part 7 Permit (dredging and reclamation) will be required from DPI Fisheries for placement of rock in the waterway.

Potential impacts primarily relate to water quality, amenity and ecology and have been addressed by this REF. The works are required allow the protection of the shared user path. In general, given the localised and temporary nature of the works, it is expected that the project would have few adverse impacts on the surrounding environment, typically of a low to negligible level. Where potential environmental impacts have been identified, control measures have been recommended.


8 Certification

CERTIFICATION OF REVIEW OF ENVIRONMENTAL FACTORS

Project Name:	Bank Rehabilitation Works, Nepean River	Proposal ID#:	
Project Manager:	Jerome Alchin	Project Budget:	\$900,000

Does the activity have a capital investment value of more than \$5million?	Yes	No
Does the activity require an approval or permit in relation to:	Yes	No
- Fisheries Management Act 1994 (sections 144, 200, 205, or 219)?	Yes	No
- Heritage Act 1977 (section 57)?	Yes	No
- National Parks and Wildlife Act 1974 (section 90)?	Yes	No
- Protection of the Environment Operations Act 1997 (sections 47-49 or 122)?	Yes	No
Is it in the public interest to publish the REF?	Yes	No

I certify that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Act, The EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading.

Signature: _____  _____ Date: ___25 June 2024_____

Name: ___Jerome Allchin_____ Position: ___Project Manager_____

The proposed activity is not likely to have a significant impact on the environment and therefore an EIS is not required.

The proposed activity will not be carried out in a declared area of outstanding biodiversity value and is/is not likely to significantly affect threatened species, populations or ecological communities, or their habitats or impact biodiversity values, meaning a SIS and/or BDAR is not required.

The proposed activity may proceed the riverbanks at specific sites along the Nepean River to be rehabilitated.

I am satisfied that subject to the inclusion of the mitigation measures identified in this REF the project will not have a significant impact on the environment during the construction and operation phases.

The REF is required to be published on the Council website.

Signature: _____  _____ Date: ___25 June 2024_____

Name: _____Rob Corby_____ Position: ___Natural Resource Officer_____

Appendix A – Concept Design



Legend

- Cross section
- Extent of Works
- Hardwood rootball/log
- Hardwood pin
- Rock
- Stockpile area and Site 1 Contractors Compound
- Path protection cover and reconstruction
- Site access route
- Top of Bank
- Bottom of Bank
- Lot
- Access Ramp

**Nepean River
Riverbank Remediation**

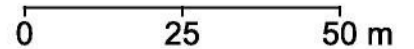
Concept Design

Site Overview



**Soil
Conservation
Service**

1:1,200 Scale at A3

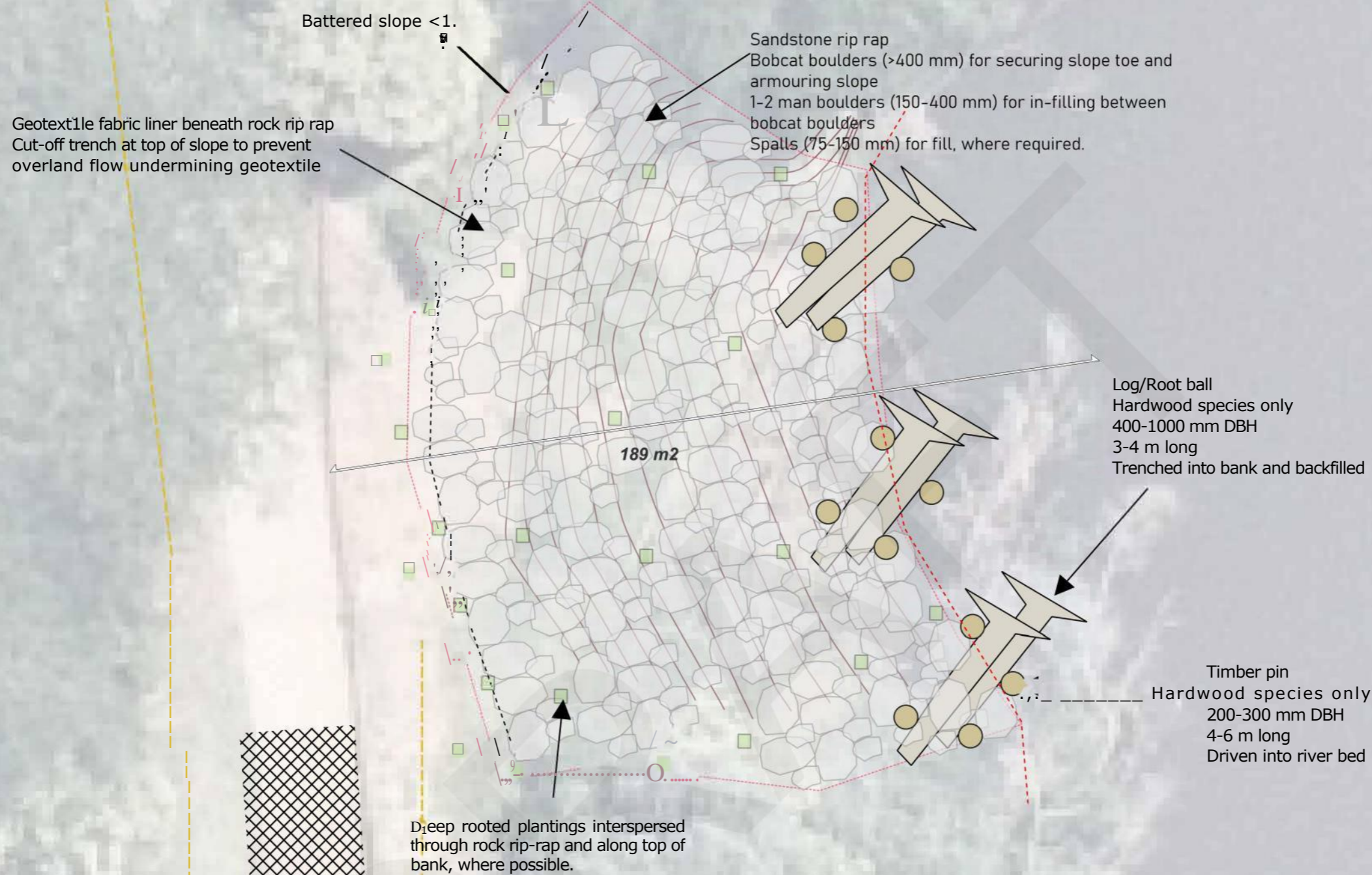


Map Produced by SCS Parramatta
Date: 2023-03-15
Coordinate System: GDA2020 / MGA Zone 56
Map: 19369_GIS_001_SiteOverview.qgz
Aerial Imagery supplied by Nearmap 2023

Nepean River Riverbank Remediation

Concept Design

Site 1



Legend

- ~ Cross section
- Extent of Works
- D Hardwood log/rootball
- D Rock
- D Hardwood pin
- D Plant
- O Stockpile area
- O Path protection cover
- Top of bank
- Bottom of bank
- Site access
- 0.5 m contour
- Lo



**Soil
Conservation
Service**

1 : 120

Scale at A3

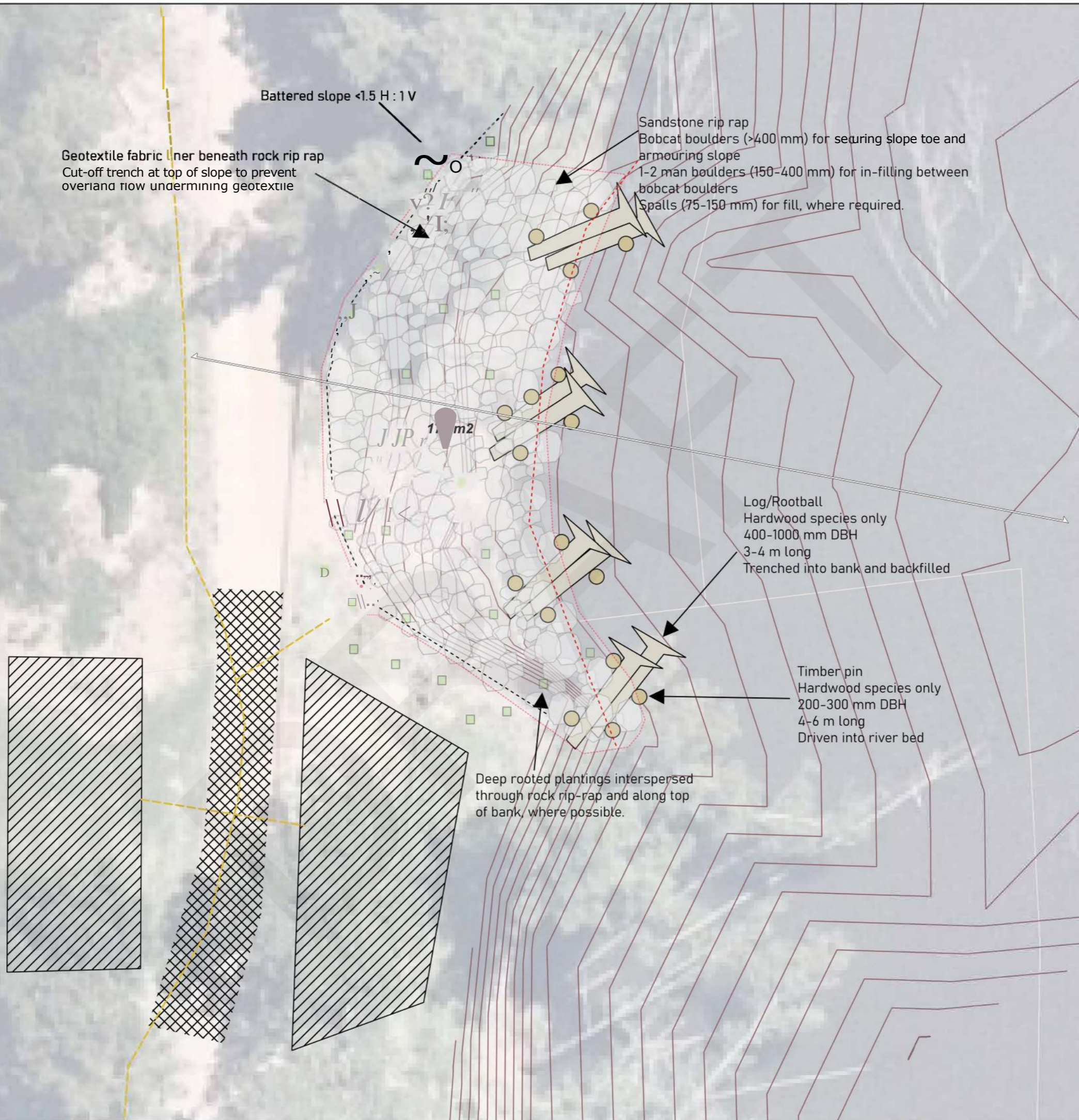
0 2 4 m

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Coordinate System: GDA2020 MGA Zone 56 Map:
19369_GIS_001_SiteOverview.qgz Aerial Imagery
supplied by Nearemap (2023)

N

Nepean River Riverbank Remediation Concept Design

Site 2



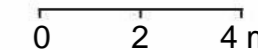
Legend

- ~ Cross section
- Extent of Works
- LII] Hardwood log/rootball
- LII] Rock
- D] Hardwood pin
- LII] Plant
- EZA Stockpile area
- O Path protection cover
- Top of bank
- Bottom of bank
- Site access
- route 0.5 m contour
- Lo



Soil
Conservation
Service

1:150 Scale at A3



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Coordinate System: GDA2020 MGA Zone 56 Map:
19369_GIS_001_SiteOverview.gqz Aerial Imagery
supplied by Nearnap (2023)

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Nepean River Riverbank Remediation

Concept Design

Site 3

Legend

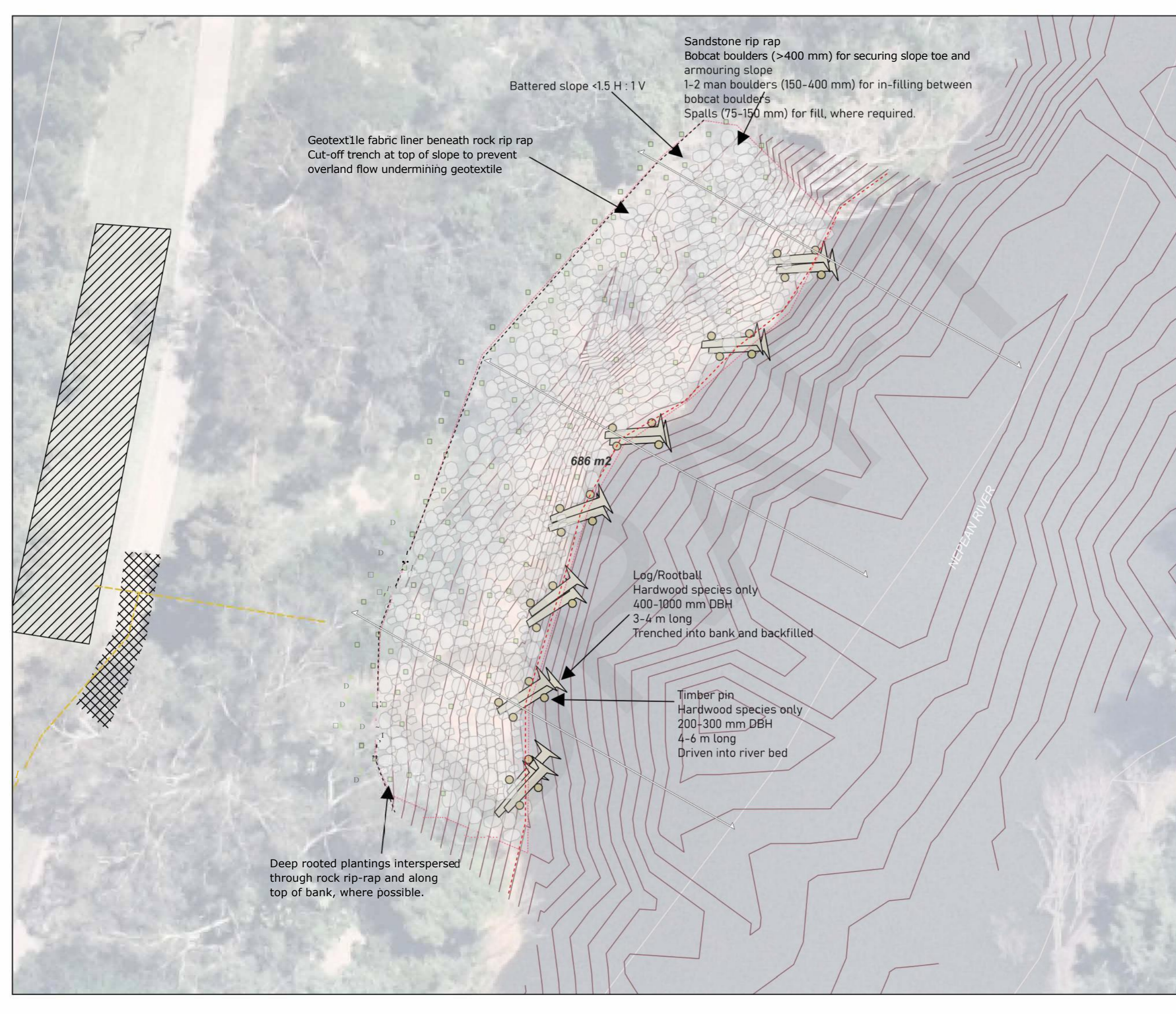
- ~ Cross section
- Extent of Works
- D Hardwood log/rootball
- Rock
- Hardwood pin
- Plant
- Stockpile area
- Path protection cover
- Top of bank
- Bottom of bank
- Site access route
- 0.5 m contour
- Lot



1 :250 Scale atA3

0 2... 4m

Map produced by SCS Parramatta Date: 2023-08-04
 Coordinate System: GDA2020 MGA Zone 56
 Map: 19369_GIS_001_SiteOverview.qgz
 Aerial Imagery supplied by Nearnmap (2023)
 N



Geotextile fabric liner beneath rock rip rap
 Cut-off trench at top of slope to prevent
 overland flow undermining geotextile

Battered slope <math><1.5 H : 1 V</math>

Sandstone rip rap
 Bobcat boulders (>400 mm) for securing slope toe and
 armouring slope
 1-2 man boulders (150-400 mm) for in-filling between
 bobcat boulders
 Spalls (75-150 mm) for fill, where required.

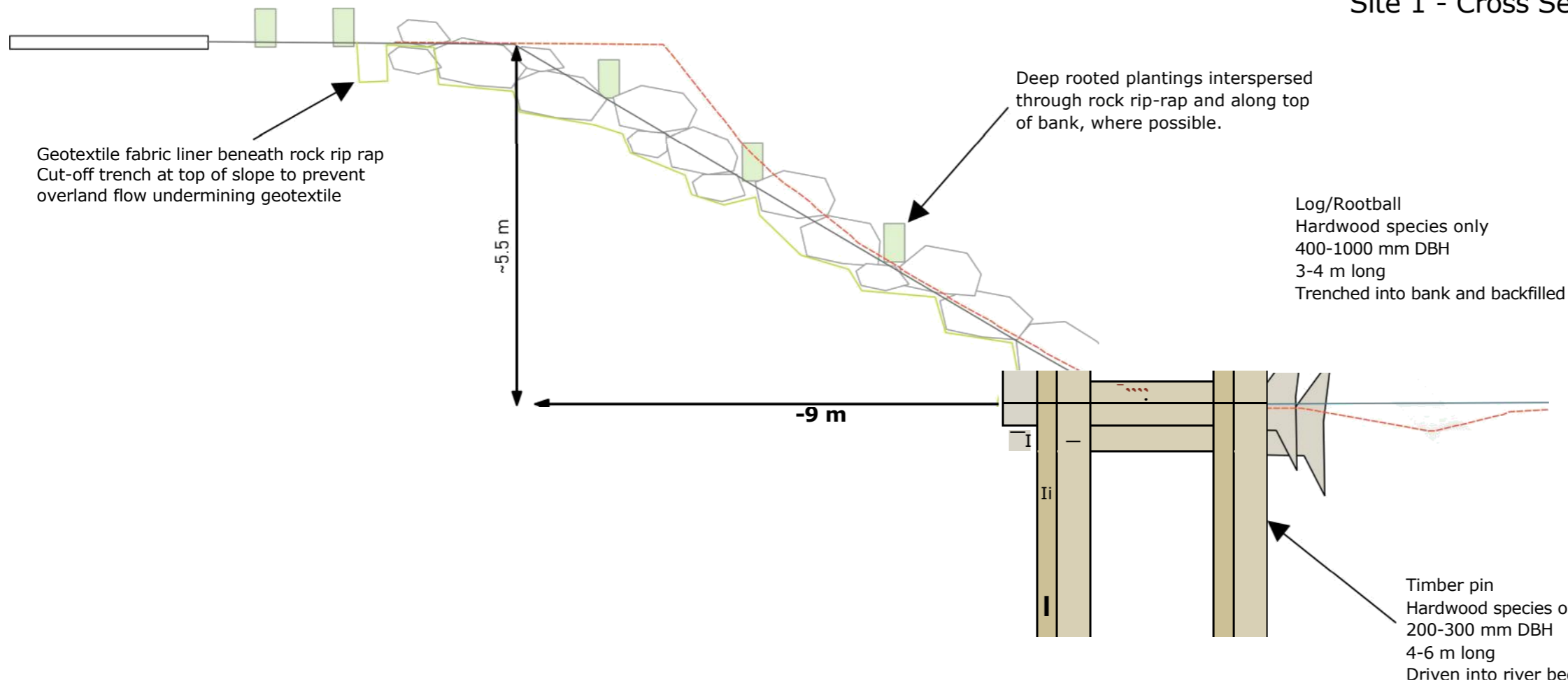
686 m²

Log/Rootball
 Hardwood species only
 400-1000 mm DBH
 3-4 m long
 Trenched into bank and backfilled

Timber pin
 Hardwood species only
 200-300 mm DBH
 4-6 m long
 Driven into river bed

Deep rooted plantings interspersed
 through rock rip-rap and along
 top of bank, where possible.

Site 1 - Cross Section 1



Nepean River Riverbank Remediation

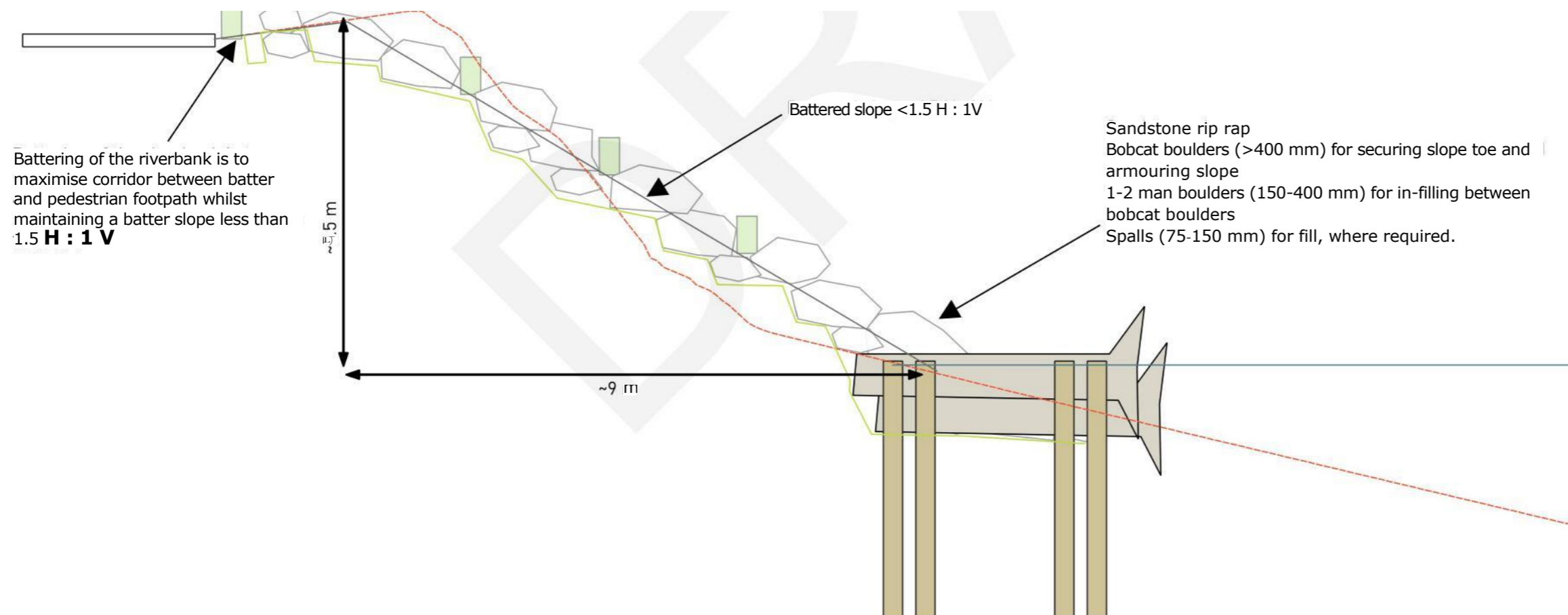
Concept Design

Cross Sections

Legend

- Current ground level
- Battered slope
- Water Level
- Geotextile fabric
- Hardwood pin
- Hardwood log/rootball
- Rock
- Planting
- Existing path

Site 2 - Cross Section 1



Soil Conservation Service








Scale at A3

Nepean River Riverbank Remediation

Concept Design

Cross Sections

Legend

-  Current ground level
-  Battered slope
-  Water Level
-  Hardwood pin
-  Planting
-  Hardwood log/rootball
-  Rock

Site 3 - Cross Section 1

Geotextile fabric liner beneath rock rip rap
Cut-off trench at top of slope to prevent overland flow undermining geotextile

Deep rooted plantings interspersed through rock rip-rap and along top of bank, where possible.

Log/Rootball
Hardwood species only
400-1000 mm DBH
3-4 m long
Trenched into bank and backfilled

Timber pin
Hardwood species only
200-300 mm DBH
4-6 m long
Driven into river bed

44

~15 m

~15 m

Site 3 - Cross Section 2

Battering of the riverbank is to maximise corridor between batter and pedestrian footpath whilst maintaining a batter slope less than 1.5 H : 1V

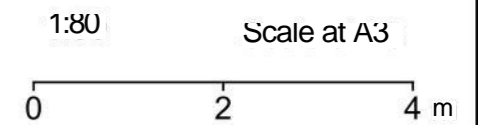
Battered slope < 1.5 H : 1V

Sandstone rip rap
Bobcat boulders (>400 mm) for securing slope toe and armouring slope
1-2 man boulders (150-400 mm) for in-filling between bobcat boulders
Spalls (75-150 mm) for fill, where required.

~7 m

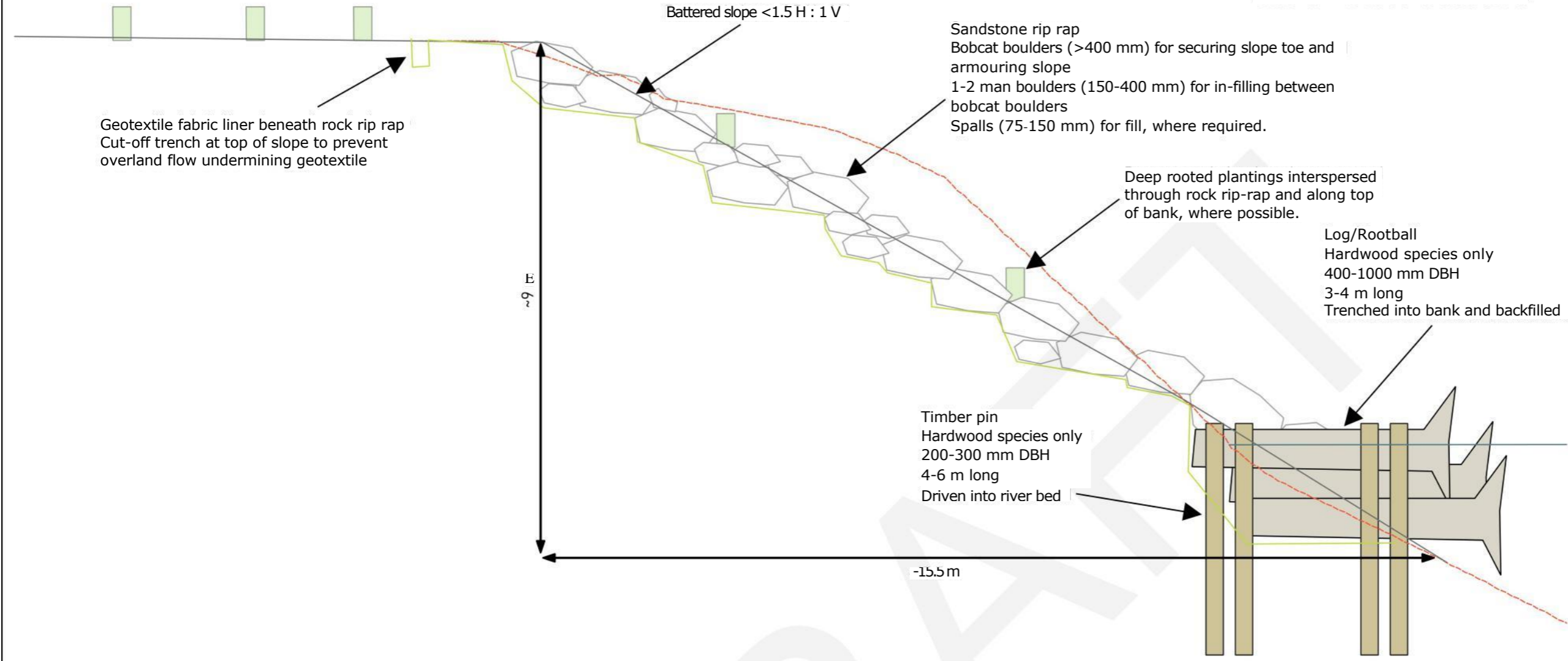
~11 m

A



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Map: 19369_GIS_002_CrossSections.qgz

Site 3 - Cross Section 3



Geotextile fabric liner beneath rock rip rap
Cut-off trench at top of slope to prevent overland flow undermining geotextile

Battered slope <1.5 H : 1 V

Sandstone rip rap
Bobcat boulders (>400 mm) for securing slope toe and armouring slope
1-2 man boulders (150-400 mm) for in-filling between bobcat boulders
Spalls (75-150 mm) for fill, where required.

Deep rooted plantings interspersed through rock rip-rap and along top of bank, where possible.

Log/Rootball
Hardwood species only
400-1000 mm DBH
3-4 m long
Trenched into bank and backfilled

Timber pin
Hardwood species only
200-300 mm DBH
4-6 m long
Driven into river bed

-15.5m








~9 m

**Nepean River
Riverbank
Remediation**

Concept Design

Cross Sections

Legend

-  Current ground level
-  Battered slope
-  Water Level
-  Hardwood pin
-  Planting
-  Hardwood log/rootball
-  Rock



1:80 Scale at A3
0 2 4 m

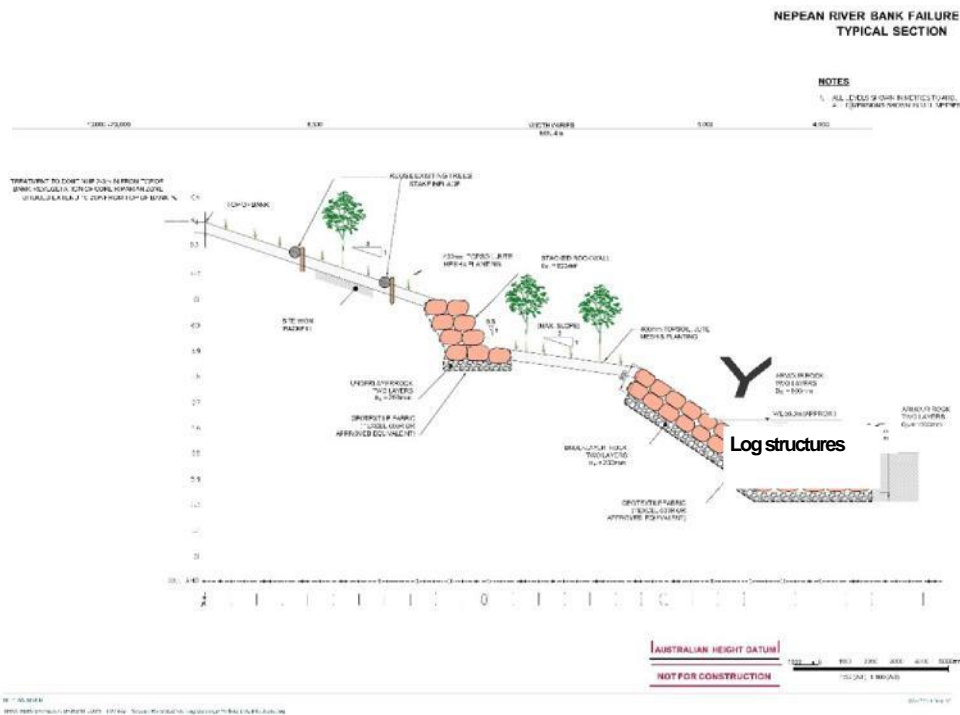


Map Produced by SCS Parramatta
Date: 2023-03-15
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Map: 19369_GIS_002_CrossSections.qgz

Nepean River Scour Site 4 – Chellaston Avenue



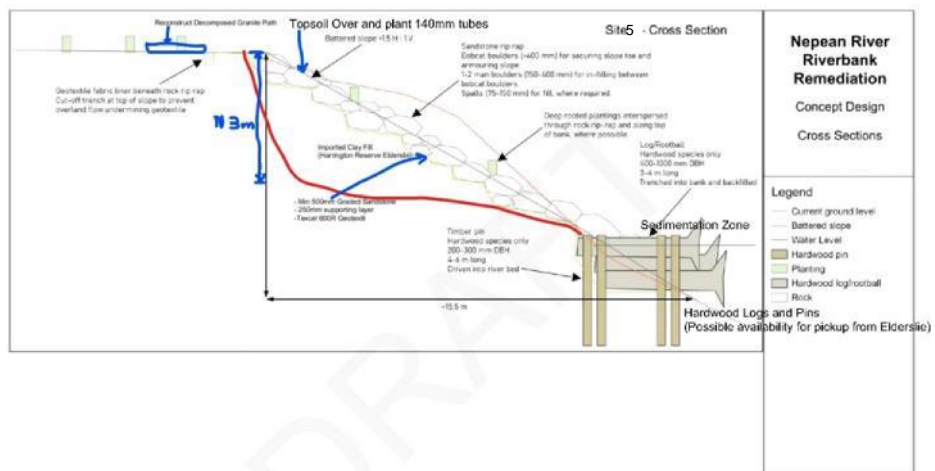
Lower priority site and typical site remediation will include some rock revetment, log structures and vegetation planting.



Nepean River Scour Site 5 – Cowpasture Reserve



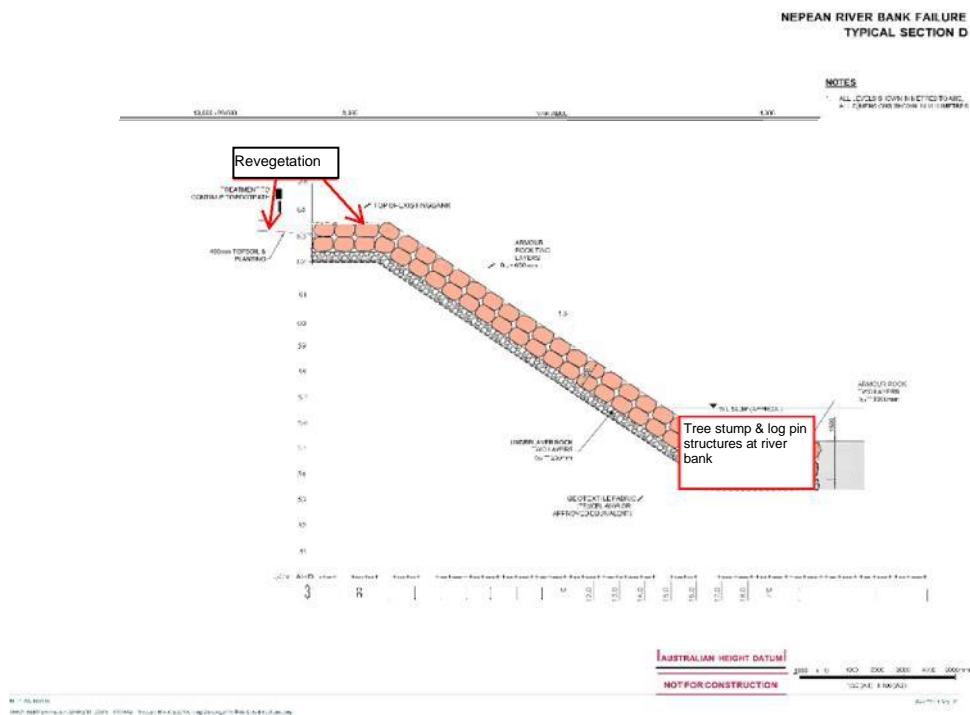
High Priority site due to proximity to playing fields and pathway.



Nepean Scour Site 6 – Cowpasture Bridge



Site 6 – Works involve filling of bank scour area, installation of rock revetment, log structures at river edge and planting. Following concept design is indicative and detailed design will have to be undertaken.



**Appendix B – Erosion and Sediment
Control Plan – Example – Sites 1-3**

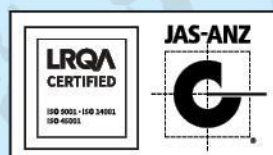
March 2023

Erosion Sediment Control Plan

Nepean River Bank Remediation – Belgenny Reserve



The Soil Conservation Service acknowledges the traditional custodians of the land where we live and work and pays respect to Elders past, present and emerging. Through our work on what was and always will be Aboriginal land, we commit to our shared responsibility to heal and protect Country for all future generations.



Connect with us

-  www.scs.nsw.gov.au
-  scs.enquiries@scs.nsw.gov.au
-  www.linkedin.com/company/soil-conservation-service

Title – Erosion and Sediment Control Plan. Nepean River Bank Remediation – Belgenny Reserve.

Published by

Soil Conservation Service March 2023. © State of New South Wales through Soil Conservation Service, 2023.

External distribution:

Version	Date	Author/s	Approved by (sign)	Released to
0.1	10/03/23	Laura Phandita		Camden Council

Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing, March 2023. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Soil Conservation Service or the user’s independent adviser.

1. Introduction

Planning for erosion and sediment control is required for land that will be disturbed or cleared of vegetation due to the potential for erosion by stormwater runoff. Erosion of soil can result in the downslope transport of sediment, which can enter adjacent watercourses, wetlands and lands. Adverse environmental impacts can result from erosion and sedimentation including:

- Reduction in water quality, increased turbidity and nutrient enrichment of water bodies
- Damage to vegetation communities
- Disturbance to aquatic flora and fauna
- Reduction in recreational and aesthetic values of waterbodies
- Increased maintenance costs
- Promotion of weed growth

This erosion and sediment control plan (ESCP) aims to minimise on-site erosion and off-site sedimentation to prevent adverse environmental impacts.

2. Project description

Camden Council have identified three priority areas of riverbank on the Nepean River that have experienced substantial scour/mass failure following a sequence of floods in 2021 2022. The sites require remediation to stabilise the riverbank, prevent on-going erosion or mass failure and protect adjacent public assets. The three sites are situated between Chellaston St (John Peat Reserve) and Peter Ave (Belgenny Reserve), as highlighted below (left). An example of the riverbank scour/mass failure is shown below (right).



The scope of works covered by this ESCP include:

- Establishment of temporary stockpile sites and path protection cover as required across machine access route
- Reshaping of priority river bank areas to ensure appropriate gradient
- Installation of rock and large woody debris to stabilise the bank

3. Supporting publications

This ESCP meets the requirements, guidelines and recommendations of:

- Landcom (2004). Managing urban stormwater: soils and construction, Volume 1 (Blue Book)
- Landcom (2004). Managing urban stormwater: soils and construction, Volume 2C Unsealed Roads (Blue Book)
- NSW Office of Environment and Heritage (2012) Erosion and sediment control on unsealed roads

4. Key strategies

The following sections outline the principles and control measures that will be employed on this project for minimising erosion and sedimentation.

4.1. Training and induction

Training and induction of all on-site personnel and subcontractors must be undertaken to ensure they are familiar with this ESCP, its implementation and their responsibilities. The importance of documenting erosion and sediment control during the project duration must be emphasised to ensure compliance with this ESCP. Regular toolbox meetings should be held during the course of the project to review this ESCP and address any arising matters relevant to erosion and sediment control. Any matters arising from a toolbox talk indicating insufficient erosion and sediment control should be revised and included in a progressive ESCP to ensure effective erosion and sediment control for the entire duration of the project.

4.2. General site principles

General site principles of erosion and sediment control:

- Keep clean water and turbid runoff separate by diverting clean water around areas being disturbed
- Construct erosion control measures as close as possible to the potential sources of sediment
- Divert runoff off disturbed surfaces as regularly as possible to reduce surface flow lengths and surface water accumulation
- Control dust by reducing vehicle speeds, limiting vehicle movements and limiting works during high winds.
- Confine machinery and vehicles to established access paths to avoid damaging roadside vegetation and disturbing soil.
- Control the spread of sediment onto sealed public roads washing down vehicles or limiting vehicle movements in wet conditions.

4.3. Minimising disturbance and clearing, and delineating limits of clearing

General measures should be implemented to ensure effective erosion and sediment control during works. These measures include:

- Timing construction and off-road driving to avoid wet weather

- Minimising the extent and duration of soil disturbance
 - Clearly mark the limits of clearing
 - Progressively install temporary erosion and sediment controls as areas of work are disturbed (e.g. sediment fences, diversion banks, etc.)
- Drainage structures are to be stabilised as quickly as possible following their construction or installation

4.4. Development of work method statements for works around watercourses and/or sensitive areas

Work areas should be kept tidy to limit the number of sediment sources by minimising the number of stockpiles on site and removing unwanted spoil stockpiles progressively and quickly where practicable. Placing material directly in place as it is being excavated will reduce stockpiling as a potential source of sediment on site. If stockpiles are required, they should be located away from areas prone to inundation and drainage lines.

4.5. Revegetation and site stabilisation

All disturbed areas should be stabilised as soon as practicable, and revegetation encouraged in areas not to be utilised (i.e., stockpile area). Erosion and sediment control structures (e.g., sediment fence) are to remain in place until the disturbed area is considered stable.

4.6. Establishment of an inspection and maintenance program

The following procedures should be implemented to regularly inspect erosion and sediment control measures:

- Erosion and sediment control measures must be inspected regularly and following rain events to ensure they continue to function effectively. Any necessary maintenance to controls must be undertaken promptly.
- Document progress of erosion and sediment control measures and maintenance undertaken.

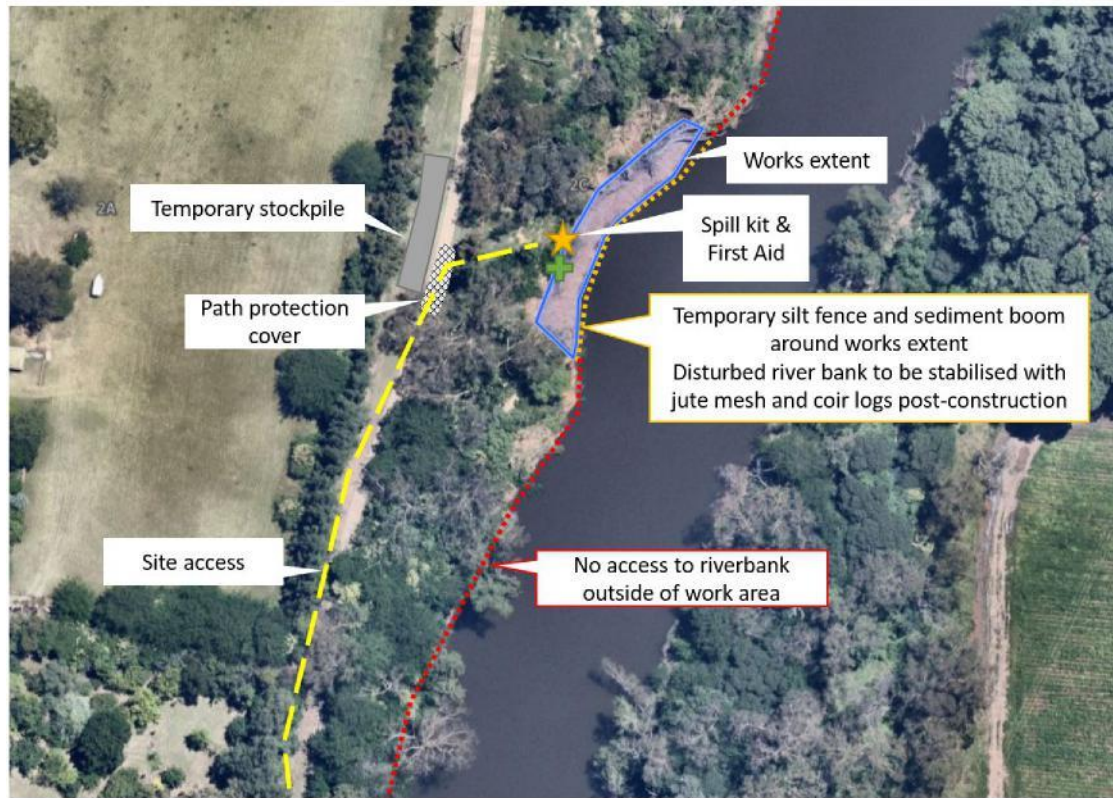
5. Conclusion

The strategies included in this plan will address erosion and sediment control issues appropriately and mitigate potential erosion and sedimentation impacts of the project. Planning, adhering to this ESCP, training and completing progressive ESCPs (if needed) will be key in ensuring good erosion and sediment control outcomes.

The scope of works will result in a relatively small area of disturbance, which can be managed effectively to mitigate erosion and sediment transport if this ESCP is adhered to.

6. Attachments

6.1. Concept Erosion and Sediment Control Plans



Notes:

1. All Staff MUST be inducted into the environmental requirements of the work,
2. Erosion & sediment controls must be available & be installed before site vegetation is cleared (or when excavation works/soil disturbance occurs),
3. Water to be monitored for signs of sediment plume and work to be halted until the sediment has settled
4. Topsoil/gravel must be stripped only from approved areas & stockpiled for re-use during site rehabilitation &/or landscaping,
5. Any spills of oil, fuel & other liquids must be cleaned up promptly & immediately reported to the site representative. All spills must be reported to relevant regulators in accordance with legislation,
6. Environmental Spill Kits of suitable material must be kept at all work sites & with all designated refuelling facilities,
7. Stockpiles must have sediment fence installed (min) & must be covered with geofabric if in place for more than 10 days and be kept clear of drainage, kerb or road surfaces to prevent sediment leaving the work site,
8. Where contamination is proven or suspected, stockpiles MUST be covered with builders plastic,
9. All surplus soils from excavations must be removed from site by covered trucks/containers & disposed of at an appropriately licensed facility.
10. Off-site ('clean') runoff should be intercepted up-slope & diverted around all disturbed areas & areas likely to be disturbed. Runoff diversion works must be adequately stabilised,
11. Stormwater inlets & drains must have controls installed where there is a risk of sediment entering stormwater infrastructure,
12. Runoff detention &/or sediment interception measures must be applied to disturbed areas where a risk is identified (ie rainfall/wind),
13. The capacity & effectiveness of runoff & erosion control measures must be maintained regularly,
14. Measures must be applied to prevent site vehicles tracking sediment & other pollutants onto any sealed roads,
15. Paved surfaces & public roads must be kept clean by removing any site materials immediately preferably by broom & shovel. Vehicles & equipment must remain on existing roads & defined site access tracks,
16. Designated areas for path protection to be covered with geotextile fabric and 200 mm crushed sandstone,
17. Site rehabilitation must be undertaken to restore disturbed areas to a stable state, temporary ESC to be left in place until 70% (or better) cover is achieved,
18. Revegetation should be undertaken to restore disturbed areas to pre-disturbance conditions. Grassed areas should be reinstated with non-invasive grass mix,
19. Changes to the ESCP must be marked up by the Site Supervisor & a Revised ESCP dated & remain current on site.
20. Vehicles/Machinery must keep to well defined access routes

NOTE

- Sediment boom should be inspected regularly during the works to ensure no low points are allowing 'seepage' of contaminants/pollution/sediment laden water.
- The location of the sediment boom is indicative and will be finalised on site.

SHUT DOWN

If works are shut down due to wet weather or other constraints:

1. Ensure stockpiles are consolidated/covered,
2. Disturbed areas are consolidated (protected from erosion),
3. All sediment controls are installed where needed and fit for use.

NEPEAN RIVER SCOUR REMEDIATION – BELGENNY RESERVE

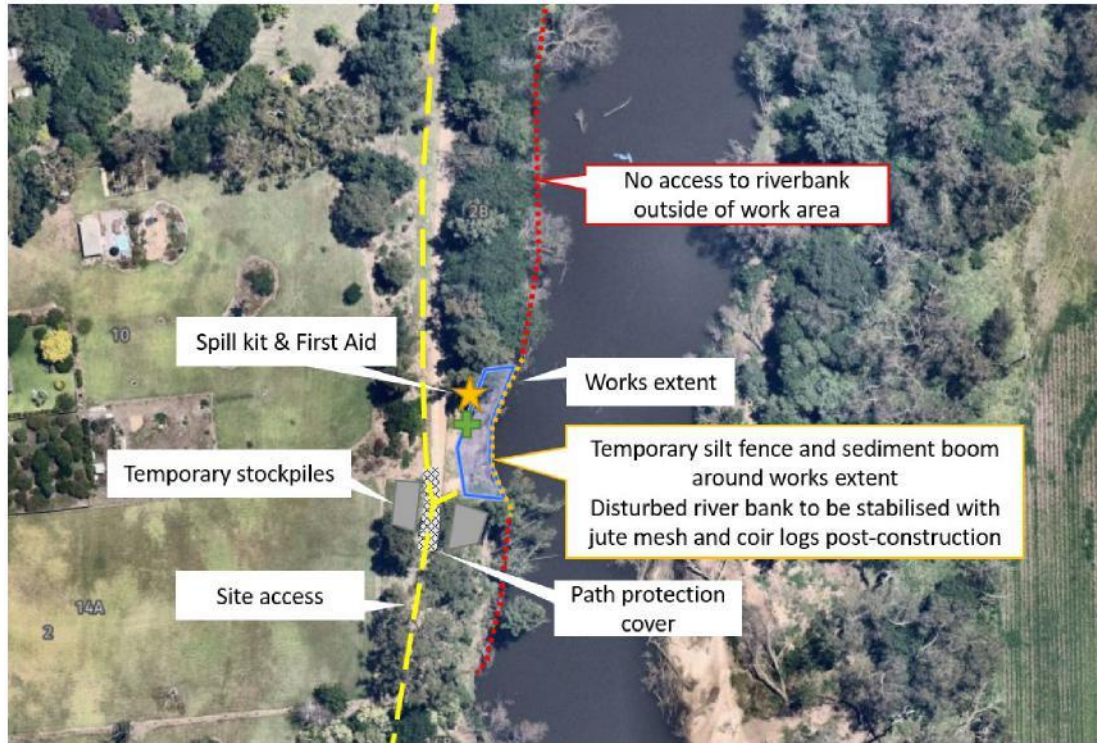
EROSION AND SEDIMENT CONTROL PLAN

Site Overview (North)

Sheet 1 of 4

Revision 1.0

Not to scale



Notes:

1. All Staff MUST be inducted into the environmental requirements of the work,
2. Erosion & sediment controls must be available & be installed before site vegetation is cleared (or when excavation works/soil disturbance occurs),
3. Water to be monitored for signs of sediment plume and work to be halted until the sediment has settled
4. Topsoil/gravel must be stripped only from approved areas & stockpiled for re-use during site rehabilitation &/or landscaping,
5. Any spills of oil, fuel & other liquids must be cleaned up promptly & immediately reported to the site representative. All spills must be reported to relevant regulators in accordance with legislation,
6. Environmental Spill Kits of suitable material must be kept at all work sites & with all designated refuelling facilities,
7. Stockpiles must have sediment fence installed (min) & must be covered with geofabric if in place for more than 10 days and be kept clear of drainage, kerb or road surfaces to prevent sediment leaving the work site,
8. Where contamination is proven or suspected, stockpiles MUST be covered with builders plastic,
9. All surplus soils from excavations must be removed from site by covered trucks/containers & disposed of at an appropriately licensed facility.
10. Off-site ('clean') runoff should be intercepted up-slope & diverted around all disturbed areas & areas likely to be disturbed. Runoff diversion works must be adequately stabilised,
11. Stormwater inlets & drains must have controls installed where there is a risk of sediment entering stormwater infrastructure,
12. Runoff detention &/or sediment interception measures must be applied to disturbed areas where a risk is identified (ie rainfall/wind),
13. The capacity & effectiveness of runoff & erosion control measures must be maintained regularly,
14. Measures must be applied to prevent site vehicles tracking sediment & other pollutants onto any sealed roads,
15. Paved surfaces & public roads must be kept clean by removing any site materials immediately preferably by broom & shovel. Vehicles & equipment must remain on existing roads & defined site access tracks,
16. Designated areas for path protection to be covered with geotextile fabric and 200 mm crushed sandstone,
17. Site rehabilitation must be undertaken to restore disturbed areas to a stable state, temporary ESC to be left in place until 70% (or better) cover is achieved,
18. Revegetation should be undertaken to restore disturbed areas to pre-disturbance conditions. Grassed areas should be reinstated with non-invasive grass mix,
19. Changes to the ESCP must be marked up by the Site Supervisor & a Revised ESCP dated & remain current on site.
20. Vehicles/Machinery must keep to well defined access routes

NOTE

- Sediment boom should be inspected regularly during the works to ensure no low points are allowing 'seepage' of contaminants/pollution/sediment laden water.
- The location of the sediment boom is indicative and will be finalised on site.

SHUT DOWN

If works are shut down due to wet weather or other constraints:

4. Ensure stockpiles are consolidated/covered,
5. Disturbed areas are consolidated (protected from erosion),
6. All sediment controls are installed where needed and fit for use.

NEPEAN RIVER SCOUR REMEDIATION – BELGENNY RESERVE

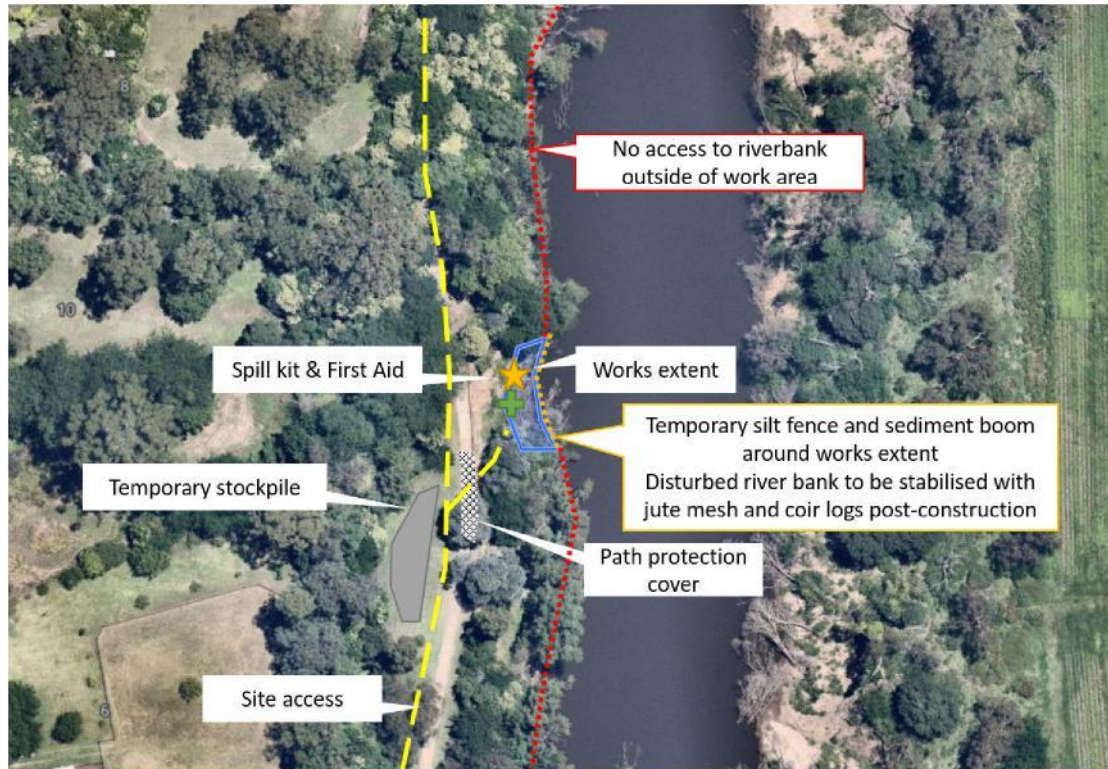
EROSION AND SEDIMENT CONTROL PLAN

Site Overview (Central)

Sheet 2 of 4

Revision 1.0

Not to scale



Notes:

1. All Staff MUST be inducted into the environmental requirements of the work,
2. Erosion & sediment controls must available & be installed before site vegetation is cleared (or when excavation works/soil disturbance occurs,
3. Water to be monitored for signs of sediment plume and work to be halted until the sediment has settled
4. Topsoil/gravel must be stripped only from approved areas & stockpiled for re-use during site rehabilitation &/or landscaping,
5. Any spills of oil, fuel & other liquids must be cleaned up promptly & immediately reported to the site representative. All spills must be reported to relevant regulators in accordance with legislation,
6. Environmental Spill Kits of suitable material must be kept at all work sites & with all designated refuelling facilities,
7. Stockpiles must have sediment fence installed (min) & must be covered with geofabric if in place for more than 10 days and be kept clear of drainage, kerb or road surfaces to prevent sediment leaving the work site,
8. Where contamination is proven or suspected, stockpiles MUST be covered with builders plastic,
9. All surplus soils from excavations must be removed from site by covered trucks/containers & disposed of at an appropriately licensed facility.
10. Off-site ('clean') runoff should be intercepted up-slope & diverted around all disturbed areas & areas likely to be disturbed. Runoff diversion works must be adequately stabilised,
11. Stormwater inlets & drains must have controls installed where there is a risk of sediment entering stormwater infrastructure,
12. Runoff detention &/or sediment interception measures must be applied to disturbed areas where a risk is identified (ie rainfall/wind),
13. The capacity & effectiveness of runoff & erosion control measures must be maintained regularly,
14. Measures must be applied to prevent site vehicles tracking sediment & other pollutants onto any sealed roads,
15. Paved surfaces & public roads must be kept clean by removing any site materials immediately preferably by broom & shovel. Vehicles & equipment must remain on existing roads & defined site access tracks,
16. Designated areas for path protection to be covered with geotextile fabric and 200 mm crushed sandstone,
17. Site rehabilitation must be undertaken to restore disturbed areas to a stable state, temporary ESC to be left in place until 70% (or better) cover is achieved,
18. Revegetation should be undertaken to restore disturbed areas to pre-disturbance conditions. Grassed areas should be reinstated with non-invasive grass mix,
19. Changes to the ESCP must be marked up by the Site Supervisor & a Revised ESCP dated & remain current on site.
20. Vehicles/Machinery must keep to well defined access routes

NOTE

- Sediment boom should be inspected regularly during the works to ensure no low points are allowing 'seepage' of contaminants/pollution/sediment laden water.
- The location of the sediment boom is indicative and will be finalised on site.

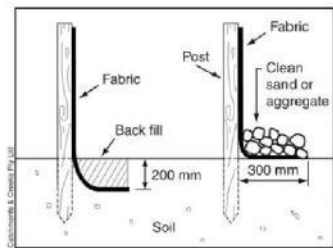
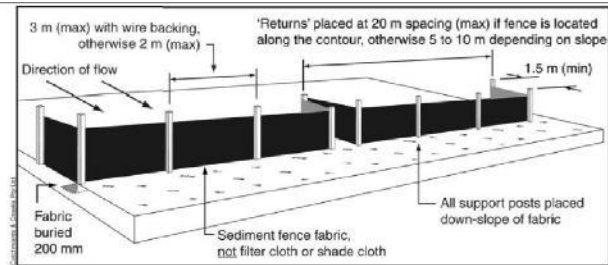
SHUT DOWN

If works are shut down due to wet weather or other constraints:

7. Ensure stockpiles are consolidated/covered,
8. Disturbed areas are consolidated (protected from erosion),
9. All sediment controls are installed where needed and fit for use.

NEPEAN RIVER SCOUR REMEDIATION – BELGENNY RESERVE
EROSION AND SEDIMENT CONTROL PLAN
Site Overview (South)

Sheet 3 of 4
Revision 1.0
Not to scale

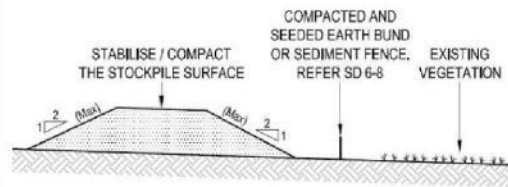


Silt/Sediment Fences

Sediment fence is a temporary permeable textile barrier which captures sediment on site whilst allowing water to flow off-site. Sediment fence is installed in a trench (or buried by clean fill) and supported by vertical posts.

Key notes:

- Do not use sediment fence in concentrated flow
- Install across the contour and include returns at max. 20 m intervals
- Ensure the bottom edge of the sediment fence is sufficiently buried in soil or clean fill by at least 200 mm
- Compact the trench after backfilling
- Anchor the sediment fence to the vertical posts using staples or wire
- Multiple fences can be installed parallel to each other if high volumes of sediment or discharge are expected. An additional sediment barrier can be placed upslope of the sediment fence using coir logs, straw bales or similar to capture the bulk of sediment prior to it reaching the sediment fence.
- Sediment fences must be checked regularly, maintained if damaged and sediment build-up removed regularly.



Stockpiles

Stockpiles should be situated away from existing vegetation, concentrated water flow lines, roads and sensitive areas. Stockpiles should be low with battered sides and positioned across the contour where possible.

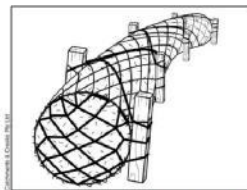


Figure 2 – Typical anchorage of geo log

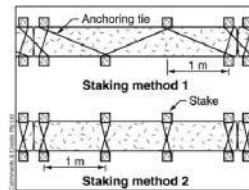


Figure 3 – Various methods of stake placement

Coir Logs

Coir logs are 'isolation barriers' primarily used to separate recently established vegetation from persistent stream flows. Due to their biodegradable nature, erosion control benefits will eventually be replaced by established vegetation. Stakes should be spaced at intervals not exceeding 1 m and sit flush with the top of the log.

Path Protection Cover

Designated machine access route across existing concrete path (between stockpiles and works extent) should be covered with geotextile fabric and 200 mm crushed sandstone. Crushed sandstone will be re-used as excess material to help reshape the riverbank immediately following decommission of the path protection cover.

Notes:

1. All Staff MUST be inducted into the environmental requirements of the work,
2. Erosion & sediment controls must be available & be installed before excavation works/stockpiling commences,
3. Stockpiles must have sediment fence installed (min) & must be covered with geofabric if in place for more than 10 days and be kept clear of drainage, kerb or road surfaces to prevent sediment leaving the work site. Stockpiles will not be established on slopes greater than 2:1.
4. If necessary (such as in periods of strong winds), dust suppression techniques must be implemented, such as water spraying of surfaces, covering stockpiles and/or application of polymer/tackifier over exposed soils.
5. Off-site ('clean') runoff should be intercepted up-slope & diverted around all disturbed areas & areas likely to be disturbed. Runoff diversion works must be adequately stabilised,
6. Stormwater inlets & drains must have controls installed where there is a risk of sediment entering stormwater infrastructure,
7. Disturbed surfaces would be compacted prior to the end of the work day or before rainfall to minimise potential for erosion and sedimentation during construction.
8. Runoff detention &/or sediment interception measures must be applied to disturbed areas where a risk is identified (i.e. rainfall/wind),
9. The capacity & effectiveness of runoff & erosion control measures must be maintained regularly,
10. Ongoing visual monitoring of drainage lines and watercourses (e.g. for turbidity) will take place throughout the activity to ensure construction activities are not resulting in sediment laden water.
11. Measures must be applied to prevent site vehicles tracking sediment & other pollutants onto any sealed roads,
12. Paved surfaces & public roads must be kept clean by removing any site materials immediately preferably by broom & shovel. Vehicles & equipment must remain on existing roads & defined site access tracks. Designated entry & exits with shaker/rumble grid or similar if required,
13. Site rehabilitation must be undertaken to restore disturbed areas to a stable state and temporary ESC to be left in place until areas are considered stable.
14. Changes to the ESCP must be marked up by the Site Supervisor & a Revised ESCP dated & remain current on site.

NEPEAN RIVER SCOUR REMEDIATION – BELGENNY RESERVE

EROSION AND SEDIMENT CONTROL PLAN

Erosion and Sediment Control Methods, Stockpile Site, and Path Protection Cover

Sheet 4 of 4

Revision 1.0

Not to scale

Appendix C – Threatened Species Search



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 09-Oct-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

Caveat

Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar):	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	45
Listed Migratory Species:	14

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	3
Commonwealth Heritage Places:	1
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	6
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [\[Resource Information \]](#)

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Community likely to occur within area
Elderslie Banksia Scrub Forest in the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area

Listed Threatened Species [\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
FROG		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
INSECT		
Austrocordulia leonardi Sydney Hawk Dragonfly [84741]	Endangered	Species or species habitat may occur within area
MAMMAL		

Scientific Name	Threatened Category	Presence Text
<u>Chalinolobus dwyeri</u> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
<u>Dasyurus maculatus maculatus (SE mainland population)</u> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
<u>Petauroides volans</u> Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
<u>Petaurus australis australis</u> Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
<u>Petrogale penicillata</u> Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
<u>Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</u> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
<u>Pseudomys novaehollandiae</u> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
<u>Pteropus poliocephalus</u> Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANT		
<u>Acacia bynoeana</u> Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
<u>Allocasuarina glareicola</u> [21932]	Endangered	Species or species habitat may occur within area
<u>Cynanchum elegans</u> White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eucalyptus benthamii Camden White Gum, Nepean River Gum [2821]	Vulnerable	Species or species habitat known to occur within area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat may occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat may occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat likely to occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat known to occur within area
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat likely to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Thelymitra kangaloonica Kangaloon Sun Orchid [81861]	Critically Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
REPTILE		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
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[Delma impar](#)

Striped Legless Lizard, Striped Snake-lizard [1649]

Vulnerable

Species or species habitat may occur within area

Listed Migratory Species

[\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
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Migratory Marine Birds

[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat likely to occur within area

Migratory Terrestrial Species

[Cuculus optatus](#)

Oriental Cuckoo, Horsfield's Cuckoo [86651]

Species or species habitat may occur within area

[Hirundapus caudacutus](#)

White-throated Needletail [682]

Vulnerable

Species or species habitat known to occur within area

[Monarcha melanopsis](#)

Black-faced Monarch [609]

Species or species habitat known to occur within area

[Motacilla flava](#)

Yellow Wagtail [644]

Species or species habitat may occur within area

[Myiagra cyanoleuca](#)

Satin Flycatcher [612]

Species or species habitat known to occur within area

[Rhipidura rufifrons](#)

Rufous Fantail [592]

Species or species habitat likely to occur within area

Migratory Wetlands Species

[Actitis hypoleucos](#)

Common Sandpiper [59309]

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

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

Commonwealth Land Name	State
Communications, Information Technology and the Arts - Australian Postal Corporation Commonwealth Land - Australian Postal Commission [12112]	NSW
Communications, Information Technology and the Arts - Telstra Corporation Limited Commonwealth Land - Telstra Corporation Limited [12115]	NSW
Commonwealth Land - Telstra Corporation Limited [12114]	NSW

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Historic Camden Post Office	NSW	Listed place

Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text
Bird		

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area overfly marine area

Extra Information

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Warragamba Dam Raising Project	2017/7940	Controlled Action	Assessment Approach
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Realignment of Link Road and residential development adjacent to Camden Bypass	2005/2181	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Northern Expansion of the Camden Gas Project	2012/6638	Referral Decision	Completed

Bioregional Assessments

SubRegion	BioRegion	Website
Sydney	Sydney Basin	BA website

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm status	Atcord	Inf
Animalia	Aves	Anatidae	02 16	<i>Oxyuro oustralis</i>		Blue-billed Duck	V,P		1	
Animalia	Aves	Anatidae	02 14	<i>Stictonetta nonfosa</i>		Freckled Duck	V,P		2	II
Animalia	Aves	Accipitridae	0226	<i>Haliaeetus leucogaster</i>		White-bellied Sea-Eagle	V,P		14	
Animalia	Aves	Accipitridae	0225	<i>Hieroetcs morphnodes</i>		Little Eagle	V,P		9	
Animalia	Aves	Scolopacidae	0164	<i>Colidris conutus</i>		Red Knot	P E,C,I,K		8	
Animalia	Aves	Cacatuidae	0268	<i>AACollocepholon fimbriatum</i>		Gang-gang Cockatoo	V,P,3	E	2	LI
Animalia	Aves	Psittacidae	0260	<i>Glossopsitto pusillo</i>		Little Lorikeet	V,P		2	
Animalia	Aves	Psittacidae	0 309	<i>tothomut discolor</i>		Swift Parrot	ELP	CE		
Animalia	Aves	Psittacidae	0302	<i>AANeophemo pukhella</i>		Turquoise Parrot	V,P,3			II
Animalia	Aves	Strigidae	02 48	<i>AANinox strenuo</i>		Powerful Owl	V,P,3		6	
Animalia	Aves	Climacteridae	8127	<i>CJimoctees picumnus yktodoe</i>		Brown Treecreeper (eastern subspecies)	V,P		1	
Animalia	Aves	Acanthizidae	0504	<i>Chthonkola sagittata</i>		Speckled Warbler	V,P		11	I
Animalia	AVCS	Neosittidae	0549	<i>Oophoenositto chrysoptuo</i>		Varied Sittella	V,P		6	
Animalia	Aves	Artamidae	8519	<i>Artomus tyonopteras cyanoptus</i>		Dusky Woodswallow	V,P		16	
Animalia	Aves	Petroicidae	8367	<i>Melanothyas cucullotocucullata</i>		Hooded Robin (south-eastern form)	V,P		2	
Animalia	Aves	Petroicidae	0380	<i>Petroico boodang</i>		Scarlet Robin	V,P			
Animalia	Aves	Petroicidae	0382	<i>'Detraains yhoeniceo</i>		Flame Robin	V,P			
Animalia	Aves	Estrildidae	0652	<i>Stagonopleuro guttota</i>		Diamond Firetail	V,P			
Animalia	Mammalia	Phascolarctidae	1162	<i>Phascolarctos cinereus</i>		Koala	EI,P	E	2	
Animalia	Mammalia	Pteropodidae	12 80	<i>Pteropus poliocephalus</i>		Grey-headed Flying-fox	V,P	V	57	

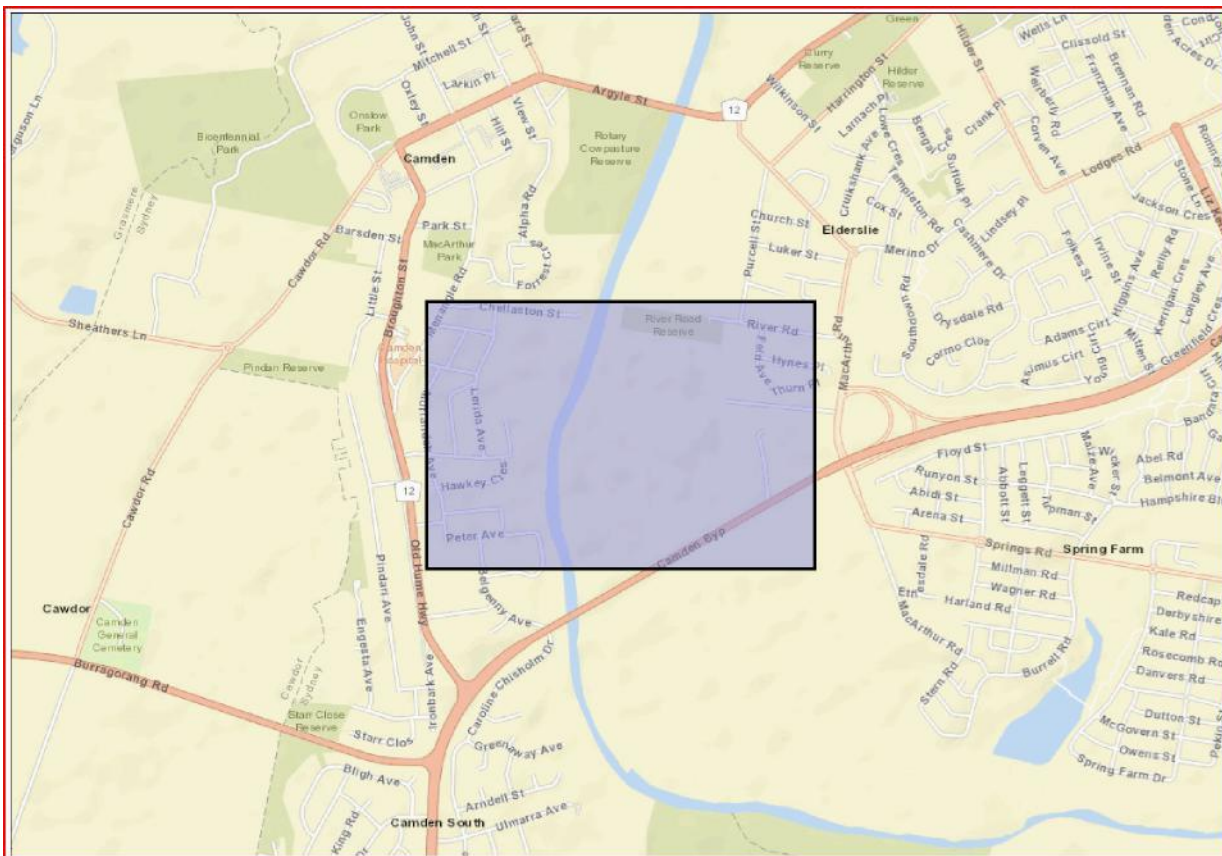
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Appendix D – AHIMS SEARCH

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -34.0696, 150.6946 - Lat, Long To : -34.0607, 150.71.

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



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

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

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

You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.

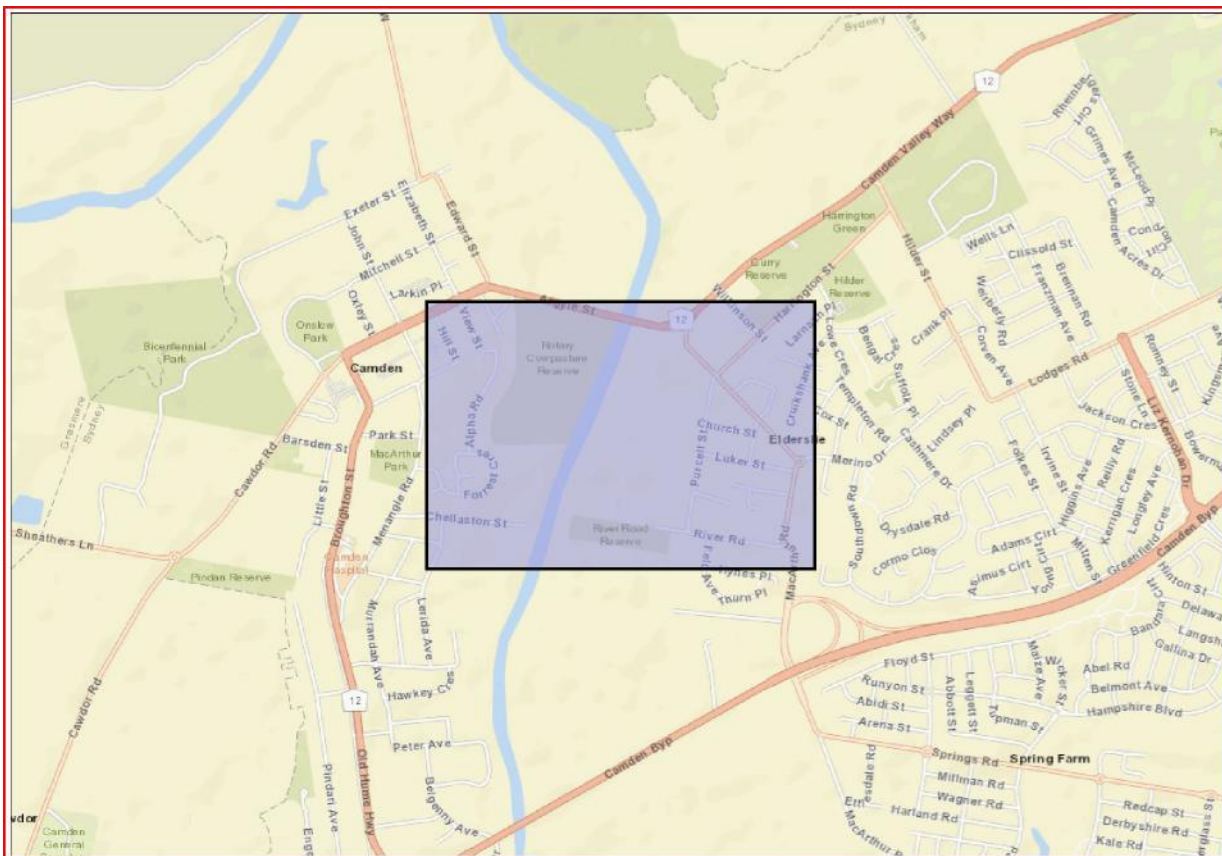
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government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

Important information about your AHIMS search

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

AHIMS Web Service search for the following area at Lat, Long From : -34.0626, 150.6967 - Lat, Long To : -34.0537, 150.7121.

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



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

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

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

You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.

- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
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