REVIEW OF ENVIRONMENTAL FACTORS

PREPARED UNDER PART 5.1 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

ASSESSMENT OF ENVIRONMENTAL EFFECTS FOR THE SETTLERS ROAD LANDSLIDE REMEDIATION

Document Revision History			PROJECT NO.		
ISSUE	**DATE**	**ISSUE DETAILS / REMARKS**	**AUTHOR**	**CHECKED**	**APPROVED**
Rev 0	4/08/23	Draft for review	A. Stathis	C. Weller	-
Rev 1	31/08/23	Response to CCC and NPWS comments	A. Stathis	C. Weller	C. Weller

REF publication decision checklist

1. Is the REF exempt from being published (under s171(6) of the EP&A Regulation)? That is, does the work involve: • Sensitive government infrastructure (critical infrastructure asset) • Sensitive government information (early works for projects that are confidential) If 'no', continue to the checklist below. If 'yes', publishing of the REF is not required.	Yes	No ☒

If the answer to any of the questions below is "yes", the review of environmental factors must be published. See instructions for how to publish the REF below.

1. Is the value of the work more than $5 million? For guidance on calculating the CIV see link: Calculation of capital investment value	Yes ☐	No ☒
2. Is the work likely to need any of the following permits or approvals before it may be carried out?		
Aquaculture permit (s144 *Fisheries Management Act 1994*)	Yes ☐	No ☒
Permit to harm marine vegetation (s205 *Fisheries Management Act 1994*)	Yes ☐	No ☒
Permit to block fish passage (s219 *Fisheries Management Act 1994*)	Yes ☐	No ☒
Approval for work on a state heritage listing or interim heritage order (s57 *Heritage Act 1977* (where an application for approval is to be made under s60))	Yes ☐	No ☒
Aboriginal heritage impact permit (s90 *National Parks and Wildlife Act 1974*)	Yes ☐	No ☒
Environment protection licence for scheduled activity (premises or non-premises based) (s48 and s49 *Protection of the Environment Operations Act 1997*)	Yes ☐	No ☒
Environment protection licence for non-scheduled activities to regulate water pollution (s122 *Protection of the Environment Operations Act 1997*)	Yes ☐	No ☒
3. Would the public have an interest in the work? (s171(4)(c) of EP&A Regulation) Note 1: The following questions are provided as a guide to help decide whether it is in the public interest to publish the REF. Note 2: If needed, seek guidance from the Communications and Engagement team.		
a) Has the work, issue or project been reported in the media? b) Is the work part of a political announcement, project or initiative? c) Could the work change the landscape character or visual amenity of a place permanently? (more than a minor change) d) Does the work change access, traffic movements or parking for residents, businesses or a community facility? e) Does the work change the visibility of a business or a community facility? (more than a minor change) f) For rail activities, does the work involve a change in the listing of an item of local environmental heritage? Or for all other activities, does the work involve permanent and more than a minor change to an item of local environmental heritage?	Yes ☐	No ☒

[i] Additional approvals or permits listed in s171(4) that do not generally apply to Transport for NSW (for which publication of an REF would be required):

- Permit to carry out dredging or reclamation by a local government authority (s200 *Fisheries Management Act 1994*)
- Environment protection licence for scheduled development work (s47 *Protection of the Environment Operations Act 1997*)
- Forestry operation carried out in accordance with an integrated forestry operations approval or authorised private native forestry plan (s122 *Protection of the Environment Operations Act 1997*)

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National Parks and Wildlife Service navigation matrix

The following table has been developed to assist National Parks and Wildlife Service (NPWS) in navigating the combined Transport and NPWS template. The table summarises how each of the chapters of this REF links with each of the chapters in the NPWS Standard REF template.

Chapter #	NPWS Chapter	Where addressed in this REF
1	Brief description of the proposed activity	Chapter 1.1 Description of Existing Environment and 1.5 Proposal Description
2	Proponent's details	Pg. 4 under **Error! Reference source not found.**
3	Permissibility and assessment pathway	Chapter 2 Statutory and Planning Framework
3.1	Permissibility under NSW legislation	Chapter 2.2 State Legislation and Planning Policy
3.1.1	*National Parks and Wildlife Act 1974 (NPW Act) and NPW Regulation*	Chapter 2.2.5 *National Parks and Wildlife Act 1974 (NPW Act)*
3.1.2	*Wilderness Act 1987* (for activities in wilderness areas)	Chapter 2.2.10 *NSW Wilderness At 1987*
3.1.3	*Biodiversity Conservation Act 2016 (BC Act)*	Chapter 2.2.4**Error! Reference source not found.** *Biodiversity Conservation Act 2016 (BC Act)*
3.1.4	*Rural Fires Act 1997* (RF Act)	Chapter 2.2.11 *Rural Fires Act 1997* (RF Act)
3.2	*Environmental Planning and Assessment Act 1979*	Chapter **Error! Reference source not found.**1.2 Purpose of the report Chapter 2.2.1 *Environmental Planning and Assessment Act 1979*
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3.2.2	Strategic plans	Chapter 1.3.1 Strategic need for the proposal
3.3	Other relevant NSW legislation	Chapter 2.2 Other relevant NSW legislation
3.3.1	*Coal Mine Subsidence Compensation Act 2017*	Not applicable for this proposal
3.3.2	*Fisheries Management Act 1994*	Chapter 2.2.6 *Fisheries Management Act 1994*
3.3.3	*Heritage Act 1977*	Chapter 2.2.7 *Heritage Act 1977*
3.3.4	*Marine Estate Management Act 2014*	Not applicable for this proposal
3.4	Does Commonwealth legislation apply?	Chapter 2.1 Commonwealth legislation
3.5	Consistency with NPWS policy	Chapter 2.2.5 *National Parks and Wildlife Act 1974 (NPW Act)*
3.6	Summary of licences and approvals	Chapter 5.3 Licensing and approvals
3.6.1	Approval under the National Parks and Wildlife Act	Not applicable for this proposal
3.6.2	Other approvals	No other approvals required
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4	Consultation – general	Chapter 3 Consultation
4.1	Consultation required under Transport and Infrastructure State Environmental Planning Policy	Chapter 2.2.2 SEPP (Transport and Infrastructure) consultation and **Error! Reference source not found.**
4.2	Consultation requirements under National Parks and Wildlife Act for leases and licences	Not applicable for this proposal

Chapter #	NPWS Chapter	Where addressed in this REF
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5	Consultation – Aboriginal communities	Chapter 3**Error! Reference source not found.** Consultation
5.1	Native title notification requirements	Chapter 2.1.2 *Native Title Act 1993*
5.2	Parks under other joint management arrangements	Not applicable for this proposal
5.3	Other parks	Not applicable for this proposal
6	Proposed activity (or activities)	Chapter 1.1 Description of Existing Environment and 1.5 Proposal Description
6.1	Location of activity	Chapter 1.1 Description of Existing Environment and 1.5 Proposal Description
6.2	Description of the proposed activity	Chapter 1.6.1 Construction activities
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7.2	Consideration of alternatives	Chapter 1.4**Error! Reference source not found.** Options considered
7.3	Justification of preferred option	Chapter 1.4**Error! Reference source not found.** Options considered
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Chapter #	NPWS Chapter	Where addressed in this REF
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1. Introduction

The Hawkesbury and Central Coast Local Government Areas faced their worst flooding in 60 years in March 2022. Hawkesbury and Central Coast Councils propose to remediate a section of Settlers Road that was damaged by a serious landslide during the severe weather event. The slope above Settlers Road and the road surface were severely damaged by this landslide. Remediation works are therefore proposed to stabilise and rebuild the damaged slope and road.

Key features of the proposal would include:

- Site establishment works to allow for safe access, including any stabilisation required.
- Removal of damaged vegetation along the slope, scaling of loose rock and unstable material
- Excavation works to cut back colluvial slope
- Establishment of debris flow barrier
- Roadway finishing and pavement works.

The location of the proposal is shown in Figure 1-1. Chapter 1.4 describes the proposal in more detail.

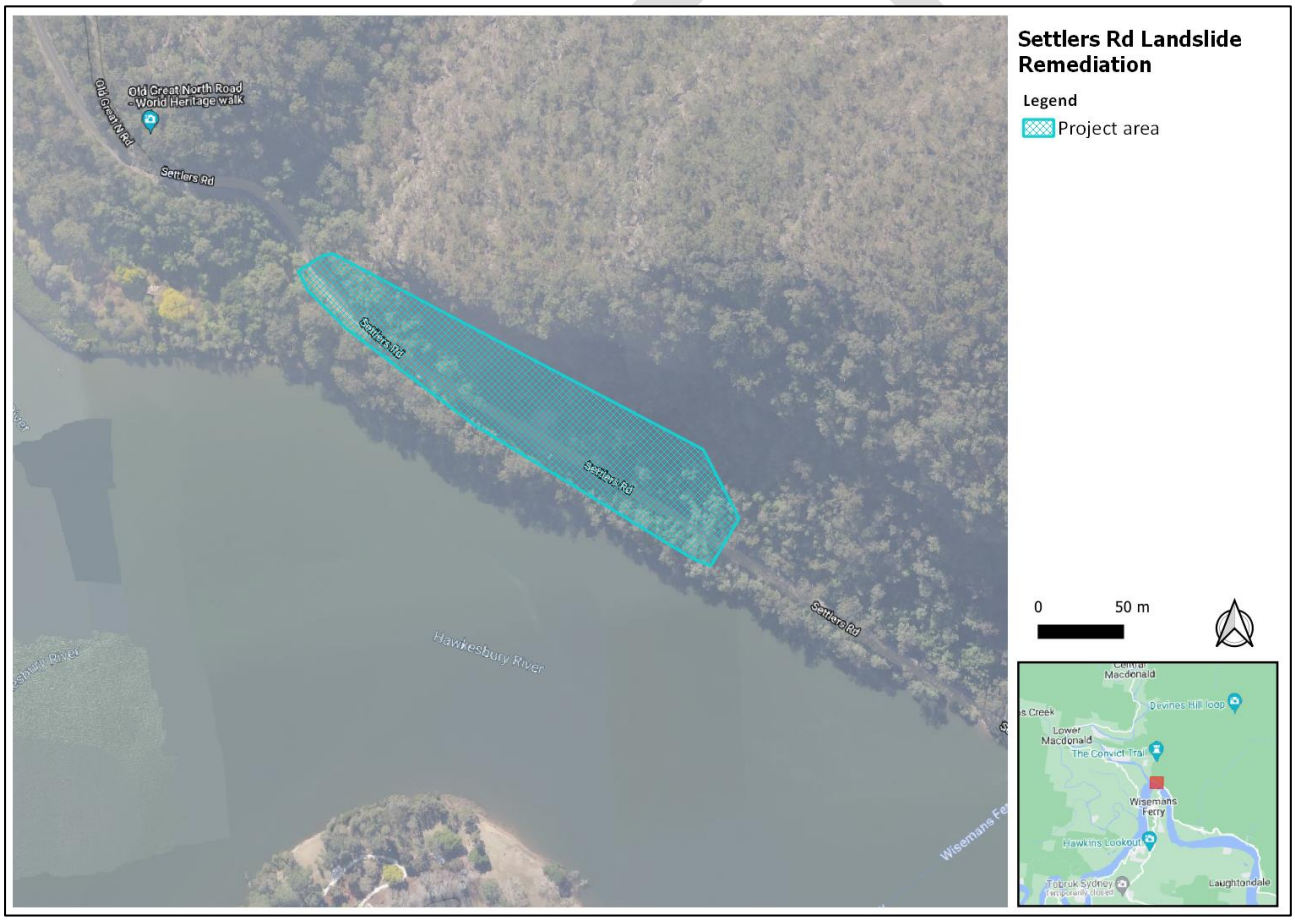


Figure 1-1 Location of the proposal

1.1 Description of Existing Environment

The Hawkesbury LGA is located 55 kilometres north-west of Sydney CBD within the Hawkesbury River Valley. It is the largest LGA area in the Sydney basin with an area of approximately 2,800 square kilometres and an estimated population of 66,136 as at 2016. The Central Coast Council Local Government Area is likewise a large LGA that comprises an area of approximately 1,681 square kilometres ranging from coastal NSW west to the Hawkesbury River. The proposal area is located on a western extent of the Central Coast LGA and eastern extent of the Hawkesbury LGA.

The study area comprises an approximately a 200 m length of Settlers Road, located about 250 m north-west of the Wiseman Ferry car on/off ramp. The site comprises the south-southwest facing foot slopes of a Hawkesbury Sandstone cliff line/escarpment and typically comprises a thick colluvial deposit, with some sandstone rock outcrops associated with partly buried rock benches. The colluvium comprises a mixture of soil and rock, containing rock blocks up to five metres in size and extends for about 40 m to 60 m from the toe of the escarpment to Settlers Road. A buried cliff line was noted near the toe of the slope, about 8 m to 10 m from the road and comprises thinly bedded sandstone and/or siltstone.

Much of the landslide debris and fallen trees which obstructed the roadway was removed by CCC and Jersey kerbs were installed close to the centreline of the road to move traffic away for cut/slope toe area, consequently reducing the roadway in this area to a single lane with traffic light flow controls.

1.2 Purpose of the Report

The purpose of the review of environmental factors (REF) is to describe the proposal, to document the likely impacts of the proposal on the environment, to detail mitigation measures to be implemented and to determine whether or not the project can proceed. For the purposes of this work Central Coast Council is the proponent and determining authority under Division 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The description of the proposed work and assessment of associated environmental impacts has been undertaken in context of Part 8 of the Environmental Planning and Assessment Regulation 2021, *Guidelines for Division 5.1 assessments (DPE, 2022)* the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so the REF helps to fulfil the requirements of section 5.5 of the EP&A Act including that Central Coast Council examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.
The findings of the REF would be considered when assessing:

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

1.3 Need and Options Considered

1.3.1 Strategic Need for the proposal

Settlers Road is a significant stretch of road for the local community that allows access north-east of Wisemans Ferry all the way to St Albans. St Albans Bridge has a load limit of 15t with only one heavy vehicle permitted on the Bridge at one time. Settlers Road is not subject to such load limits, and therefore is the main route for heavy vehicles travelling north-west of Wisemans Ferry. Since the early 2022 flood damage Settlers Road has been subject to load limits and traffic controls which has delayed road users and impeded the use of the road.

The remediation of Settlers Road is essential for maintain access for the community north of Wisemans Ferry, when this bridge is not accessible, travel times increase by about an hour. The existing landslip site was rated as the highest priority (i.e., most critical) site in a recent site prioritisation report (GHD 2022) of some 41 landslide sites along a 23.9 km length of Settlers Road and Wisemans Ferry Road between Wisemans Ferry and Spencer. As such, remediation is required to aid in the reinstatement of Settlers Road to its former condition and capacity.

1.3.2 Objectives of the Proposal

The objectives of the proposal are to:

- Remediate road infrastructure.
- Remediate the slope with consideration of the ecological values of the region.
- Minimise environmental impact.
- Ensure safe working environment for all project staff.

1.3.3 Limitations of existing infrastructure

Due to severe wet weather over the last several years the slope subject to this approval experienced failures. The slope is at risk of failing further if remediation solutions are not applied.

1.4 Options considered

The options considered for the proposal included:

- Option 1: The 'do nothing' option.
- Option 2: Cut back colluvial slope and install rockfall barrier.
- Option 3: Cut back colluvial slope and install berm.
- Option 4: Cut back colluvial slope and install debris flow barrier.
- Option 5: Rock shed – existing road alignment.
- Option 6: Rock shed – cut into colluvial/rock slope.
- Option 7: Bridge/Viaduct.
- Option 8: Cut back colluvial slope with anchored (soil nailed) mesh in upper colluvial slope.

Option number	Concept	Advantages	Disadvantage
Option 1	'Do nothing'	No additional environment impacts associated with construction would result. No costs/funding would be required.	The objectives of the proposed works would not be achieved. The slope would not be repaired and would continue to operate at a reduced capacity. Residents would continue to be impacted by traffic control safety measures on the road. There would be a high risk of failure especially in future heavy rain events.

Option 2	Cut back colluvial slope, install structural rock bolts and/or shotcrete, and install rockfall barrier	Cost effective option (subject to disposal cost) Relatively fast construction.	Requires access onto lower rock bench for construction and subsequent inspections. Large volumes of material requiring disposal. Rock barrier requires on going maintenance once installed. Suitable for isolated rock blocks, but unlikely to cope with potential large debris flows.
Option 3	Cut back colluvial slope, install structural rock bolts and/or shotcrete, and install catch berm	Cost effective option (subject to disposal cost) Relatively fast construction for the berm. Could potentially use site won materials to construct the berm. Berm could be revegetated – minimal visual impact. Berm could be designed to withstand multiple impacts without repair. Relatively low maintenance compared to Option 2 and 4.	Large volumes of material requiring disposal. Berm will need regular clearing of material. Requires difficult plant access onto lower rock bench for construction and subsequent inspections/clearing. Significantly impacted by variable ground conditions. Large footprint required for berm. Slope angle for berm needs to be relatively flat. Berm will likely need to be reinforced using geotextile, mesh or similar. Flows may be diverted to edge of berm – limited space for diversion.
Option 4	Cut back colluvial slope, install structural rock bolts and/or shotcrete, and install debris flow barrier	Relatively cost-effective option (subject to disposal cost). Relatively fast construction. Can withstand a variety of materials from fine to large boulders. Similar to Option 2, by with increase protection against shallow landslides and thus slightly lower slope risk.	Large volumes of material requiring disposal. Requires access onto lower rock bench for construction and subsequent inspections/clearing. Debris barriers require some level of maintenance – particularly after is has been deployed compression brakes need replacing and support ropes and containment mesh are checked for serviceability. Shallow landslide barrier requires ongoing maintenance once installed.

Option 5	Rock shed – existing road alignment	Reduces need to access upper colluvial slope. Increased risk reduction compared to Options 2 and 4.	Workers will be at risk during construction unless temporary protection is provided from upslope hazards. Will result in a height restriction for the road. Expensive option. Structure likely to stand out visually from other sections of the riverbank.
Option 6	Rock shed – cut into rock slope	Moves road alignment away from potential unstable down slope issues. Reduces need to back fill between rock face and rock shed compared to Option 2A. Reduces need to access upper colluvial slope. Increased risk reduction compared to Options 2,3, 4 and 5.	Large volumes of material requiring disposal. Will result in a height restriction for the road. Structure likely to stand out visually from other sections of the riverbank.
Option 7	Bridge/Viaduct	Removes the need to excavate large volumes of material. No access required onto the upper slope. Robust, long term solution. Increased risk reduction compared to Options 2,3, 4 and 5.	Prohibitively expensive option. Likely to require more rigorous environmental approvals. Detailed and relatively complex geotechnical and structural design required. Structure likely to stand out visually.
Option 8	Anchored mesh	Little maintenance required once installed. No reshaping of upper slope or access benching required. Vegetation can grow back through the mesh once installed. Increased risk reduction compared to Option 2 (but not compared to options 4, 5 & 6).	Relatively expensive option. Durability of mesh facing – limited design life unless stainless steel is used. Only likely to be suitable for relatively shallow landslides within the upper colluvial slope. Requires vegetation removal from most of the upper colluvial slope to allow the mesh to be installed.

The preferred option and justification:

A multi criteria qualitative assessment was undertaken to rank the options against six (6) nominated criteria, allocating each a sore out of ten (10). The six criteria were:

- Constructability
- Construction risks
- Long term risk/durability
- Environmental and road reserve constraints
- Impact on road users
- Relative cost

Options 2, and 4 had the highest ratings of 67, and 68 respectively not inclusive of tipping fees.

Option 4 has been chosen as the preferred option over Option 2, as for a relatively minor increase in price the debris fence in this option affords an increase protection against landslide debris including both rock blocks and shallow soil slumps/slides, whereas the Option 2 rock catch fence would be designed primarily to catch individual rock blocks (and not landslide debris).

Option 4 has been selected as the preferred option as it would achieve all objectives of the proposed work and scored highest in relation to the chosen option assessment criteria. This option would remediate the damage while also offering protection against future landslides along Settlers Road.

1.5 Proposal Description

1.5.1 Background

The Hawkesbury and Central Coast Local Government Areas faced their worst flooding in 60 years in March 2022. The Councils intend to carry out remediation work to the uphill slope along Settlers Road which was damaged as a result of the early 2022 flooding.

The uphill slope has undergone significant collapse as a direct result of increased soil saturation from the 2022 'La Niña' event. The particularly heavy rainfall event in late February/early March 2022 appears to have triggered the large-scale landslide. The landslide has been monitored at a high level for further movement after the largescale slip. However, it can be presumed that at some point without remediation there will be further collapse affecting the amenity of the road, with a high possibility that the road will be unsafe for vehicular access.

Settlers Road is a critical access point for residents, when this road is not accessible, travel times increase by about an hour. The slope will require remediation to stabilise and reinstate full use of the road. Figure 1-2 to Figure 1-6 show the existing damage to the roadway.

Figure 1-2 A view of the damaged slope from above prior to initial clean up

Figure 1-3 views of the damaged roadway looking south east

Figure 1-4 Views of the landslide looking north

Figure 1-5 View looking upslope-Note buried cliff line in centre of image

Figure 1-6 View of large boulder

1.6 Design

1.6.1 Construction activities

This section summarises the methodology, work hours, plant and equipment and associated activities for construction of the proposal.

Indicative work methodology

The following construction steps are proposed to ensure the safe construction during the remedial works for this option:

1. Site mobilisation and set up.
2. Clearing of colluvial material commencing at the rock cliff crest in manageable sections, nominally no longer
3. than 50 m in length. Where rock crest is not encountered within 5 m (horizontal) of the anticipated location,
4. advice should be sought from the geotechnical designer prior to continuing.
5. Clearing of unstable colluvium in a top-down manner back to a 'solid' surface (i.e. weathered rock).
6. Dislodgement and cleaning of the exposed rock surface.
7. Geotechnical assessment of rock bolt and shotcrete requirements by geotechnical designer.
8. Drill and install rock bolts and shotcrete dowel with reinforcement as required.
9. Shotcrete application.
10. Installation of debris fence at the rock cliff crest.
11. Road pavement and drainage works.
12. Site demobilisation.

Works would be required to take place 24 hours 7 days a week to ensure that the Project is completed in the most timely manner possible. This is essential to allow the road to be returned to working order as fast as possible for the residents.

Plant and equipment- To be finalised after tender

The following machinery and equipment may be required for the completion of this project:

- Light 4WD vehicles (for site supervisor, and traffic control)
- Various hand tools
- Excavator
- Roller/compactor
- Tipper trucks
- Low loaders/float trucks
- Elevated work platforms
- Generator
- Chainsaws
- Concrete trucks and pumps
- Excavator mounted drilling equipment for soil nails/rock bolts.

1.6.2 Ancillary Facilities

Site amenities will be established near the Thomas James Bridge construction site, which is located about 100 metres west of the slope works. The amenities will be used by both the contractor for the Thomas James Bridge reconstruction and the slope remediation and stabilisation work.

In addition to the site amenities, a small stockpile area has been identified at 6444 Wisemans Ferry Rd about 8km south-east of the worksite. The site is located within National Parks land and the usage of this stockpile site will be permitted for use by Central Coast Council via a separate Review of Environmental Factors. Note that this site is proposed to be used for several Central Coast Council Natural Disaster Recover projects within the general locality. This stockpile site will not be permitted for use until the National Parks and Wildlife Service determine the separate REF.

1.6.3 Construction hours and duration

Construction would be carried out both within and outside of standard working hours as defined by the Interim Construction Noise Guideline (ICNG; DECC, 2009) and summarised in Table 1-1. The works are required to be conducted during both standard and non-standard construction hours due to Road Occupancy Licence (ROL) conditions, in order to maintain road user and pedestrian safety. It is anticipated that the proposal would commence in the fourth quarter of 2023.

Table 1-1 Standard and OOHW periods

Period of works	Monday to Friday	Saturday	Sunday and Public Holidays
Standard hours	7am – 6pm	8am – 1pm	No work
OOHW Period 1	6pm – 10pm	7am – 8am	8am – 6pm
		1pm - 10pm	
OOHW Period 2	10pm – 7am	10pm – 8am	6pm – 7am

1.6.4 Earthworks

Spoil would be temporarily stockpiled adjacent to road on the road verges and removed off-site in the same shift.

Colluvial landslide debris between the level of Settlers Road and the interpreted rock cliff crest will be removed to expose a solid surface (i.e. weathered rock). It is anticipated that the face may be near vertical. However, buried rock benches or flatter rock slopes may exist.

Removal of material would be ceased upon encountering any rock bench or weathered rock surfaces. Removal of loose material and rock blocks shall be reviewed onsite by the geotechnical designer/geotechnical representative at regular intervals throughout the excavation process to gauge that excessive material is not removed and that material removal occurs in a judicious, practical and safe manner without further destabilising the slope or increasing the risk(s) to construction personnel or plant.

Quantities of excavated and imported materials would not exceed the quantity that can be handled each shift. The estimated total quantity of material to be removed is 3400m3 this volume is subject to change based upon the encountered conditions.

2 Statutory and Planning Framework

2.1 Commonwealth Legislation

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

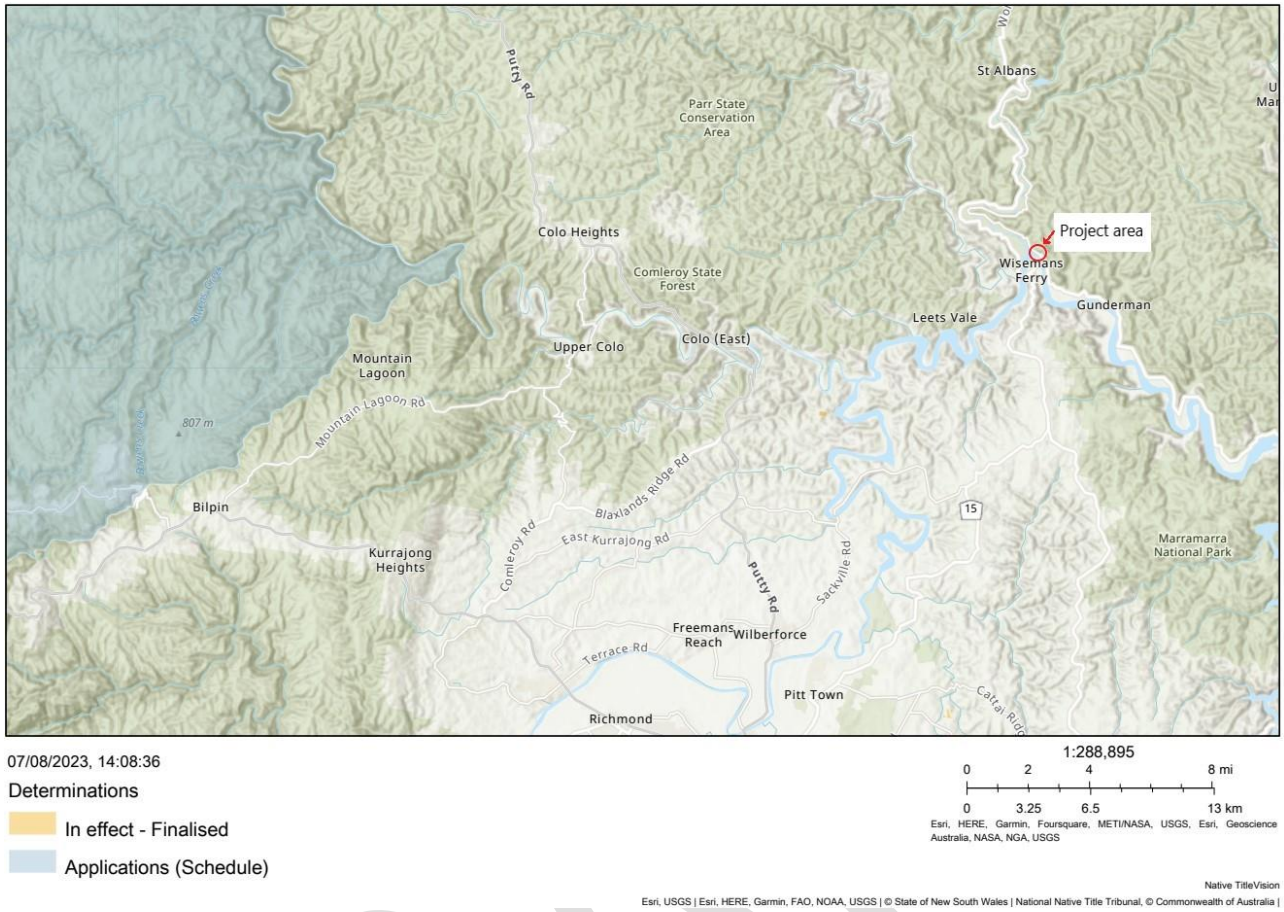
The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of national environmental significance (NES). The EPBC Act lists seven matters of NES which must be addressed when assessing the impacts of a project. An assessment of how the project may impact on matters of NES is outlined below.

- **World heritage properties:** While the proposal exists within the buffer zone of the Australian Convict Sites (Old Great North Road Buffer Zone). There are no World Heritage Properties that would be affected by the proposed activity
- **National heritage places:** There are no National heritage places that would be affected by the activity
- **Wetlands of international importance:** There are no Wetlands of international importance that would be affected by the activity.
- **Commonwealth listed threatened species and ecological communities:** There are no Commonwealth listed threatened species or ecological communities that are likely to be affected by the activity.
- **Commonwealth listed migratory species:** The proposed activity would not be undertaken in or affect any Commonwealth marine areas.
- **Nuclear action:** The proposed activity would not involve any nuclear activities
- **Commonwealth marine areas:** The proposed activity would not be undertaken in or affect any Commonwealth marine areas

2.1.2 Native Title Act 1993

The *Native Title Act 1993* recognises and protects native title. The Act covers actions affecting native title and the processes for determining whether native title exists and compensation for actions affective native title. It establishes the Native Title Registrar, the National Native Title Tribunal, the Register of Native Title Claims and the Register of Indigenous Land Use Agreements, and the National Native Title Register. Under the Act, a future act includes proposed public infrastructure on land or waters that affects native title rights or interest.

A search of the Native Title Tribunal Native Title Vision website was undertaken, with no Native Title holders/claimants identified.



2.2 State Legislation and Planning Policy

2.2.1 Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act (EP&A Act) is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of proposals. The activity constitutes an activity under Part 5 of the Environmental Planning and Assessment Act 1979 and as such, this proposal is being assessed in accordance with the NSW Environmental Planning and Assessment Act 1979 and the NSW Environmental Planning and Assessment Regulation 2000. The EP&A Act 1979 is the principal planning legislation for NSW. As a local government authority, Central Coast City Council is a determining authority under Part 5 of the Act. Accordingly, Council must satisfy Part 5 of the Act by examining, and considering to the fullest extent possible, all matters which are likely to affect the environment. This REF is intended to assist, and ensure Council's compliance, with the EP&A Act and the requirements of clause 228 of the EP&A Regulation 2000. The Proposal is not likely to significantly affect the environment, and no Environmental Impact Statement (EIS) is required.

2.2.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

The State Environmental Planning Policy (Transport and Infrastructure) 2021 superseded the State Environmental Planning Policy (Infrastructure) 2007 on 1 March 2022.

State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP) aims to facilitate the effective delivery of infrastructure across the State. Under Division 17 Roads and road infrastructure facilities, Clause 2.109 allows for development for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent on any land. As the project involves the repair of a road or road infrastructure facility under prescribed circumstances, this work is permissible without development consent.

2.2.3 Roads Act 1993

The objectives of this Act include, but are not limited to, the rights of persons to pass along public roads, the rights of neighbouring landowners, the responsibilities and requirements of roads authorities and the regulation of various activities on public roads. The Council is the roads authority for all public roads within an LGA, other than any freeway, crown road, or road for which some other public authority is declared to be the roads authority. Section 71 of the Act states that, "*A roads authority may carry out road work on any public road for which it is the roads authority and on any other land under its control.*"

2.2.4 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act* 2016 (*BC Act*) commenced on 25 August 2017 repealing the *Threatened Species Conservation Act 1995*. The *BC Act* seeks to conserve biological diversity and promote ecologically sustainable development (ESD), to prevent extinction and promote recovery of threatened species, populations and ecological communities; and to protect areas of outstanding biodiversity value. The BC Act provides a list of threatened species, populations and ecological communities, areas of outstanding biodiversity value, and key threatening processes.

Part 7 of the *BC Act* requires that the significance of the impact on threatened species, populations and endangered ecological communities listed under the *BC Act* or *FM Act*, are assessed using a five-part test. Where a significant impact is likely to occur, a Species Impact Statement (SIS) or Biodiversity Assessment Report (BAR) must be prepared in accordance with the Secretary's requirements.

The project is not likely to have a significant impact on flora and fauna in the project area. The proposal is likely to involve minor vegetation removal in an already significantly disturbed area and would not significantly impact fauna habitat.

Owing to the location of works, a biodiversity assessment has been carried out for the Project and is attached as Appendix B. This assessment found no threatened species or ecological communities would be significantly impacted by the Project.

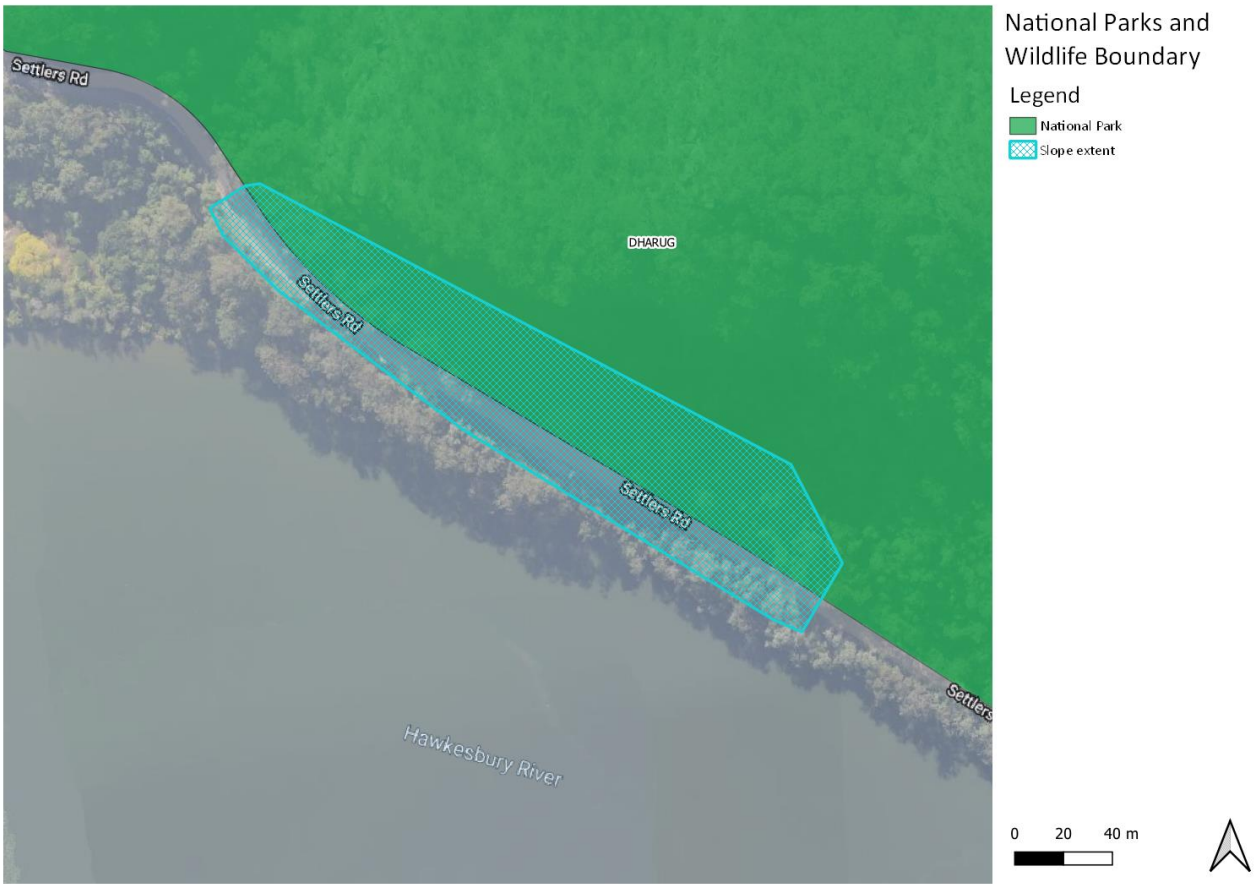
2.2.5 NSW National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 (NPW Act) is administered by the NSW Environment, Energy and Science group of DPIE with the intent of conserving the states natural and cultural heritage, fostering public appreciation, understanding and enjoyment of the natural and cultural heritage of NSW and managing any lands reserved for these purposes.

Under the Act it is an offence to:

- Knowingly destroy, deface or damage an Aboriginal object or place without consent;
- Pick or harm any plant or animal that is protected or is a threatened species, population or ecological community; or
- Damage any critical habitat or habitat of a threatened species, an endangered population or an endangered ecological community or reserved land.

The Project is partly located on the western edge of Dharug National Park. Consultation with the National Parks and Wildlife Services (NPWS) has formed part of the preparation of this REF and NPWS are co-signatories of the REF.



There is no evidence that the site is in close proximity to any objects or places of Aboriginal archaeological significance. It is not expected that the proposed activity would impact upon any Aboriginal objects or places. The proposal is additionally, not adjacent or within any lands reserved under this Act. The proposed activity is unlikely to harm Aboriginal objects and therefore a permit under the NP&W Act is not required.

2.2.6 Fisheries Management Act 1994

Fisheries Management (FM) Act provides for the protection, conservation, and recovery of threatened species, populations and ecological communities of fish and marine vegetation and fish habitats, as well as promoting the development and sharing of fishery resources in NSW. It applies to all inland waters in the NSW, except for those waters classified as Commonwealth waters. The activity does not involve harm to mangroves or other protected marine vegetation, dredging or reclamation, blocking of fish passage and does not involve impact to a Key Fish Habitat waterway. Therefore, the works will not require a permit issued by the Minister in accordance with Part 7 of the FM Act.

2.2.7 Heritage Act 1977

The Heritage Act 1977 provides for the protection of heritage items of local and state significance. Where works are likely to impact upon an item listed on the State Heritage Register (SHR) approvals are required. There are no listed State heritage items located within close vicinity to the proposed work site. Therefore, the proposed works do not affect a listed heritage item either directly or indirectly. Approval of works on the site is therefore not required under part 4 of the Heritage Act.

Thomas James Bridge is not a Heritage listed item, however a Section 140 Permit is being sought for the remediation of the Thomas James Bridge which would happen at the same time as the slope stabilisation.

2.2.8 Water Management Act 2000

The aim of the *Water Management Act* 2000 is to provide for the sustainable and integrated management of the water sources of NSW. Section 91 of the Act notes the need for an approval if a controlled activity is to be undertaken at a specified location in, on, or under waterfront land. The *Water Management (General) Regulation* 2018 specifies exemptions to this in certain circumstances. Section 41 of the Regulation notes that a public authority is exempt from needing approval to undertake controlled activities in, on, or under waterfront land.

2.2.9 Waste Avoidance and Resource Recovery Act 2001

The Waste Avoidance and Resource Recovery (WARR) Act 2001 aim is to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development. It also relates to the proposal in that it aims to:
"*Ensure that resource management options are considered against a hierarchy of the following order"*

(i) Avoidance of unnecessary resource consumption,
(ii) Resource recovery (including reuse, reprocessing, recycling and energy recovery),
(iii) Disposal,

And also aims to:
"*Minimise the consumption of natural resources and final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste*".

The proposal is consistent with aims of the Waste Avoidance and Resource Recovery Act in that it has determined mitigation measures to manage waste by recycling where possible and Site generated waste will be collected and removed from the site to an approved waste disposal facility.

2.2.10 NSW Wilderness Act 1987

The objectives of the NSW Wilderness Act 1987 are:

- to provide for the permanent protection of wilderness areas;
- to provide for the proper management of wilderness areas; and
- to promote the education of the public in the appreciation, protection and management of wilderness. The proposal is not located within an area listed under the *NSW Wilderness Act 1987*.

The proposal is not located within an area listed under the *NSW Wilderness Act 1987.*

2.2.11 Rural Fires Act 1997 (RF Act)

The *Rural Fires Act 1997* (RF Act) aims to protect life and property through the following objectives:

- To prevent, mitigate and suppress bush and other fires in local government areas (or parts of areas) and other parts of the State constituted as rural fire districts
- The co-ordination of bush fire fighting and bush fire prevention throughout the State
- To protect persons from injury or death, and property from damage, arising from fires
- To protect infrastructure and environmental, economic, cultural, agricultural and community assets from damage arising from fires
- To protect the environment by requiring certain activities to be carried out having regard to the principles of ecologically sustainable development.

Under this Act, NPWS is the prescribed fire authority and is responsible for the control and suppression of all fires on lands that is under NPWS management. To assist in bush and other fire management, the fire management strategy provides the information for managing outbreaks of fire, operational guidelines for hazard reduction work and information to help assess bushfire threats. The relevant fire management strategy for this proposal Yengo National Park, Parr State Recreation Area and Dharug National Park Fire Management Plan.

Part 4 of this Act deals with the prevention of and minimisation of the spread of bushfires throughout the state. This proposal is consistent with the RF Act and the fire management strategy as is it meets the objectives of the minimising and preventing bush

and other fires from this proposal. The proposal is also aiming to increase safety and operational longevity of Settlers Rd adjacent to Dharug National Park, which would assist with future fire-fighting efforts.

2.3 Local Environmental Plans

2.3.1 Central Coast Local Environment Plan 2022

The proposal is located with the Central Coast Local Government Area (LGA), however, is on the boundary of the LGA, with the Hawkesbury the adjacent LGA.
The applicable local planning instrument for the area is the Central Coast Local Environment Plan 2022 (Central Coast LEP 2022).

The proposed Project is within an area zoned C1 and C4 (E1 and E4 respectively in Figure 2-1). C1 enables the management and appropriate use of land that is reserved under the *National Parks and Wildlife Act 1974.* C4 provides for low-impact residential development in areas with special ecological, scientific or aesthetic values. Part 2.1 Clause 2.7 of the Transport and Infrastructure SEPP serves to override the permissible development provisions of the Local Environmental Plan (LEP); the development restrictions of the LEP therefore do not apply.

2.3.2 Hawkesbury Local Environmental Plan 2012

The proposal is located on the boundary of the Hawkesbury City Council LGA and therefore the local planning instrument for the area is the Hawkesbury Local Environmental Plan 2012 (Hawkesbury LEP 2012), was considered in this REF.

The proposed Project is adjacent to land that is subject to Hawkesbury Local Environmental Plan 2012 and is zoned E1 and E4 (Figure 2-1), which provides for low-impact residential development in areas with special ecological, scientific or aesthetic values. Part 2.1 Clause 2.7 of the Transport and Infrastructure SEPP serves to override the permissible development provisions of the Local Environmental Plan (LEP); the development restrictions of the LEP therefore do not apply.

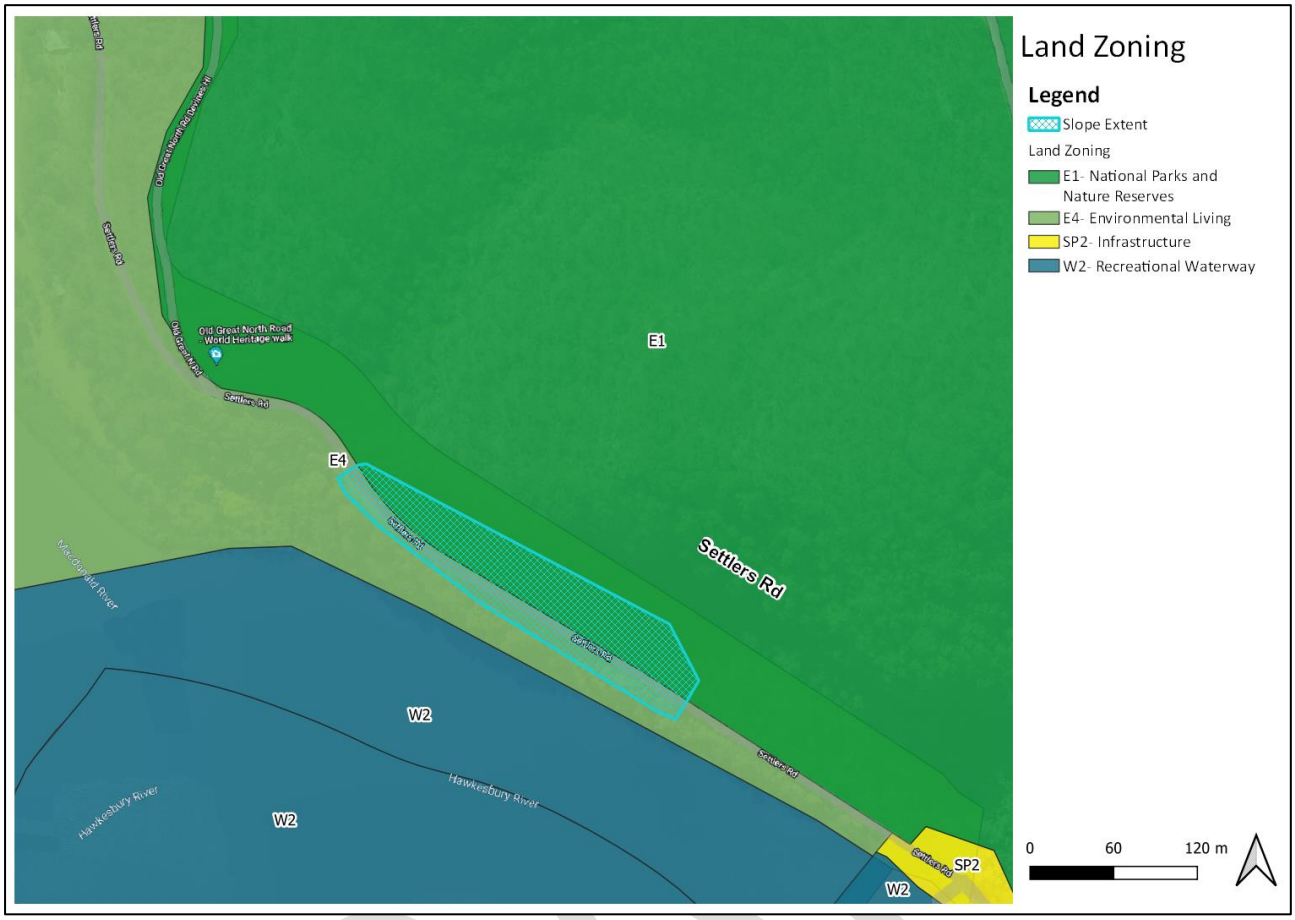


Figure 2-1 Land Zoning

3 Stakeholder and Community Consultation

State Environmental Planning Policy (Transport and Infrastructure) 2021

Part 2.2, Division 1 of the TISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. This is detailed below:

Is consultation with relevant stakeholders within council required under clauses 2.10-2.14 of the transport and infrastructure SEPP?		
Are the works likely to have a substantial impact on the stormwater management services which are provided by council? The works would not have a substantial impact on stormwater management services provided by council.	☐ Yes	☑ No
Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area? The works are not likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area.	☐ Yes	☑ No
Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of the system? The works would not affect the functioning of the existing sewer line.	☐ Yes	☑ No
Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water? The works would not involve connection to a council owned water supply system.	☐ Yes	☑ No
Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow? The work would not involve the enclosing of a public space or installation of a temporary structure on council managed land.	☐ Yes	☑ No
Will the works involve more than a minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance? The works would not involve more than a minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance.	☐ Yes	☑ No
Is there a local heritage item (that is not also a state heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential? There are no listed heritage sites or areas located in close proximity to the proposal. Thomas James Bridge is located directly adjacent to the proposal area, however would not be impacted by the works.	☐ Yes	☑ No
Does the proposal include a car park intended for the use by commuters using regular bus services? The works would not include a car park intended for the use by commuters using regular bus services.	☐ Yes	☑ No
Does the project propose a bus depot?	☐ Yes	☑ No

The work does not propose a bus depot.		
Does the project propose a permanent road maintenance depot or associated infrastructure, such as garages, sheds, tool houses, storage yards, training facilities and workers amenities? The work does not propose a permanent road maintenance depot or associated infrastructure, such as garages, sheds, tool houses, storage yards, training facilities and workers amenities.	☐ Yes	☑ No
Is the proposal within the coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land? The work has not been identified as being located in a coastal vulnerability area.	☐ Yes	☑ No/NA
Are the works located on flood liable land? If so, will the works change flooding patterns to more than a minor extent? Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled *Floodplain Development Manual: the management of flood liable* land published by the New South Wales Government. The proposal is located adjacent to flood liable land, however would not change the flooding patterns during either construction or operation.	☐ Yes	☑ No

Is consultation with a public authority (other than Council) required under Part 2.2, Division 1 of the Transport and Infrastructure SEPP?		
Are the works located on flood liable land? (to any extent) (TISEPP 2.13, 2.15) If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled *Floodplain Development Manual: the management of flood liable* land published by the New South Wales Government. The proposal is located adjacent to flood liable land, however would not change the flooding patterns during either construction or operation. In addition, the work consists of remediation activities and therefore do not comprise of more than minor alterations to the road formation that was previously in place prior to the failures.	☐ Yes	☑ No/NA
Are the works adjacent to a national park, nature reserve or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act*?* The proposal area is located partly on an area reserved under the *National Parks and Wildlife Act.*	☑ Yes	☐ No
Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone? The works are partially located on land zoned E1 or in an equivalent land use zone.	☑ Yes	☐ No
Are the works adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014*? The proposed work would not be located within or adjacent to and aquatic reserve or marine park.	☐ Yes	☑ No

Is the proposal in the foreshore area as defined by the *Sydney Harbour Foreshore Authority Act 1998* (now known as the *Place Management NSW Act 1998*)? The proposal is not located in the foreshore area as defined by the *Sydney Harbour Foreshore Authority Act 1998*	☐ Yes	☑ No
Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional facility or group home in bush fire prone land? The proposed works are not for the purpose of residential development, an educational establishment, a health services facility, a correctional facility or group home in bush fire prone land	☐ Yes	☑ No
Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory) The proposed works are not located near the dark sky region.	☐ Yes	☑ No
Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP 2012, Narrandera LEP 2013 and Urana LEP 2011). N/A. The proposed works are not located on buffer land around the defence communications facility near Morundah.	☐ Yes	☑ No
Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	☐ Yes	☑ No

Community Consultation

Due to the nature of the work being the rehabilitation of the existing roadway, no wider community consultation is proposed to be carried out prior to the Project being carried out.

Consultation with the immediately affected landholders would be carried out prior to the commencement of the work to discuss property access and lease arrangements where appropriate. Work would not commence until all necessary property access arrangements are agreed with the affected property owners.

A briefing was held between representatives of the National Parks and Wildlife Service (NPWS), Central Coast Council and Hawkesbury City Council on the 3 August 2023. It was agreed during the briefing that as part of the proposal is located within the National Park, NPWS would be co-signatories on the Project REF, which would fulfil the requirements of formal consultation under the Transport and Infrastructure SEPP.

A Start of Work notification would be distributed to the potentially affected community and stakeholders at least five business days prior to the commencement of work. The start of work notification would include information about the nature of work that would be carried out, along with the timing and a description of the potential impacts. Details of the 24-hour community hotline phone number would also be included in the notification and directing any enquires to call this number.

4 Assessment of Environmental Aspects

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment potentially impacted upon by the proposal are considered. This includes consideration of:

- Potential impacts on matters of national environmental significance under the EPBC Act
- The factors specified in the guidelines Is an EIS required? (DUAP 1995/1996) as required under clause 228(1) *of the* Environmental Planning and Assessment Regulation 2000 and the *Roads and Related Facilities EIS Guideline (DUAP 1996)*. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix A.

Site-specific safeguards and management measures are provided to mitigate the identified potential impacts.

4.1 Flora and Fauna

East Coast Ecology Pty Ltd (ECE) was commissioned by CCC c/- Hutchison Weller to prepare a Flora and Fauna Assessment (FFA), including 5-Part Test and Assessment of Significance, for the proposed works associated with slope remediation works along Settlers Road, Wisemans Ferry (the proposed activity). The following sections are based on the findings of the Biodiversity Assessment attached as Appendix B.

The overarching objective of the FFA was to evaluate the ecological values that occur within the Subject Land and identify how the proposed activity satisfies the relevant planning framework. Figure 4-1 indicates the land subject to the assessment.

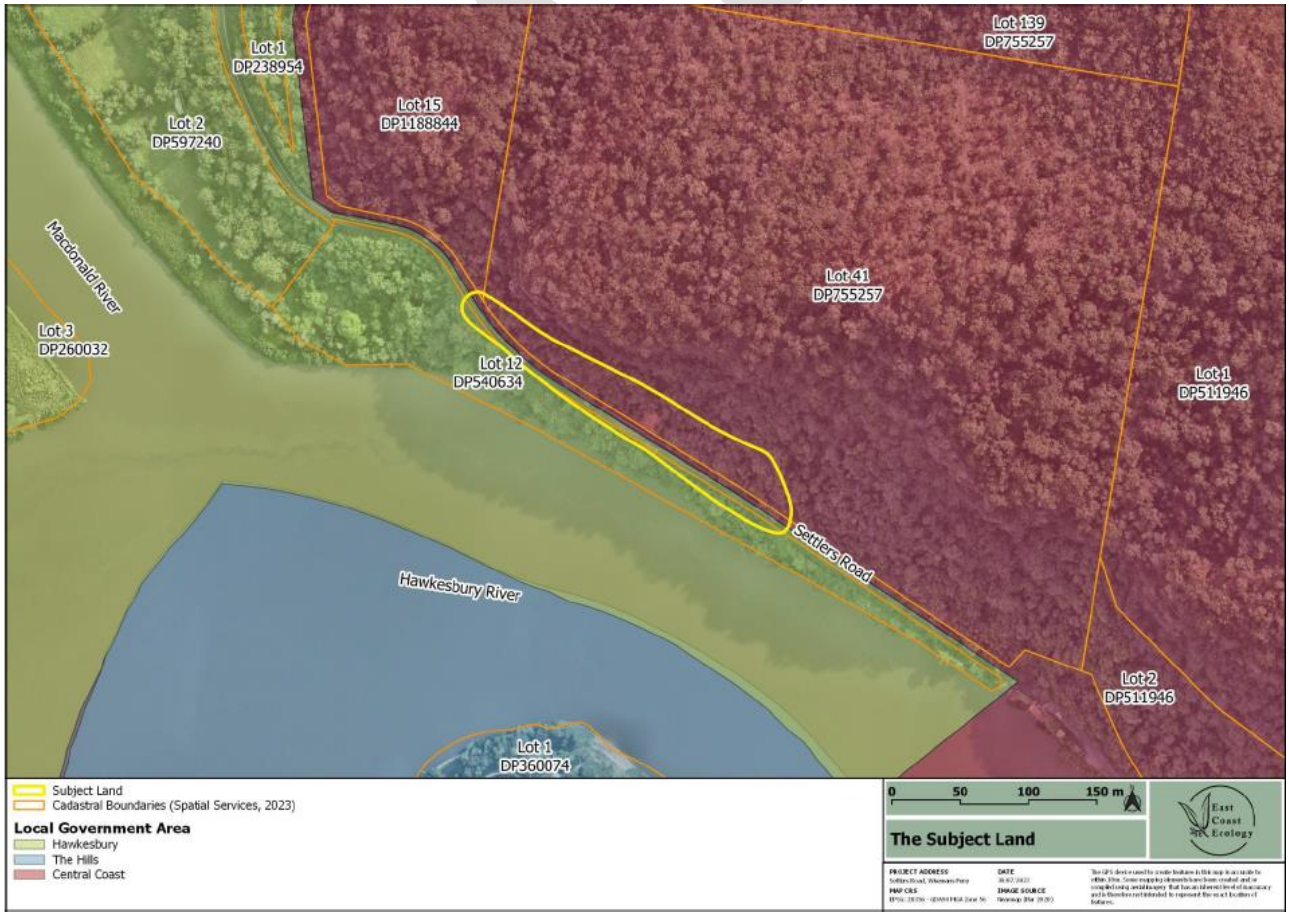


Figure 4-1 Location of the subject land.

4.1.1 Existing environment

Plant Community Types

The State Vegetation Type Map (DPE, 2023d) indicated the presence of one Plant Community Type (PCT) in proximity to the Subject Land, as shown below in Figure 4-2:

- PCT 3238: Hunter Range Colluvial Apple-Gum Forest.

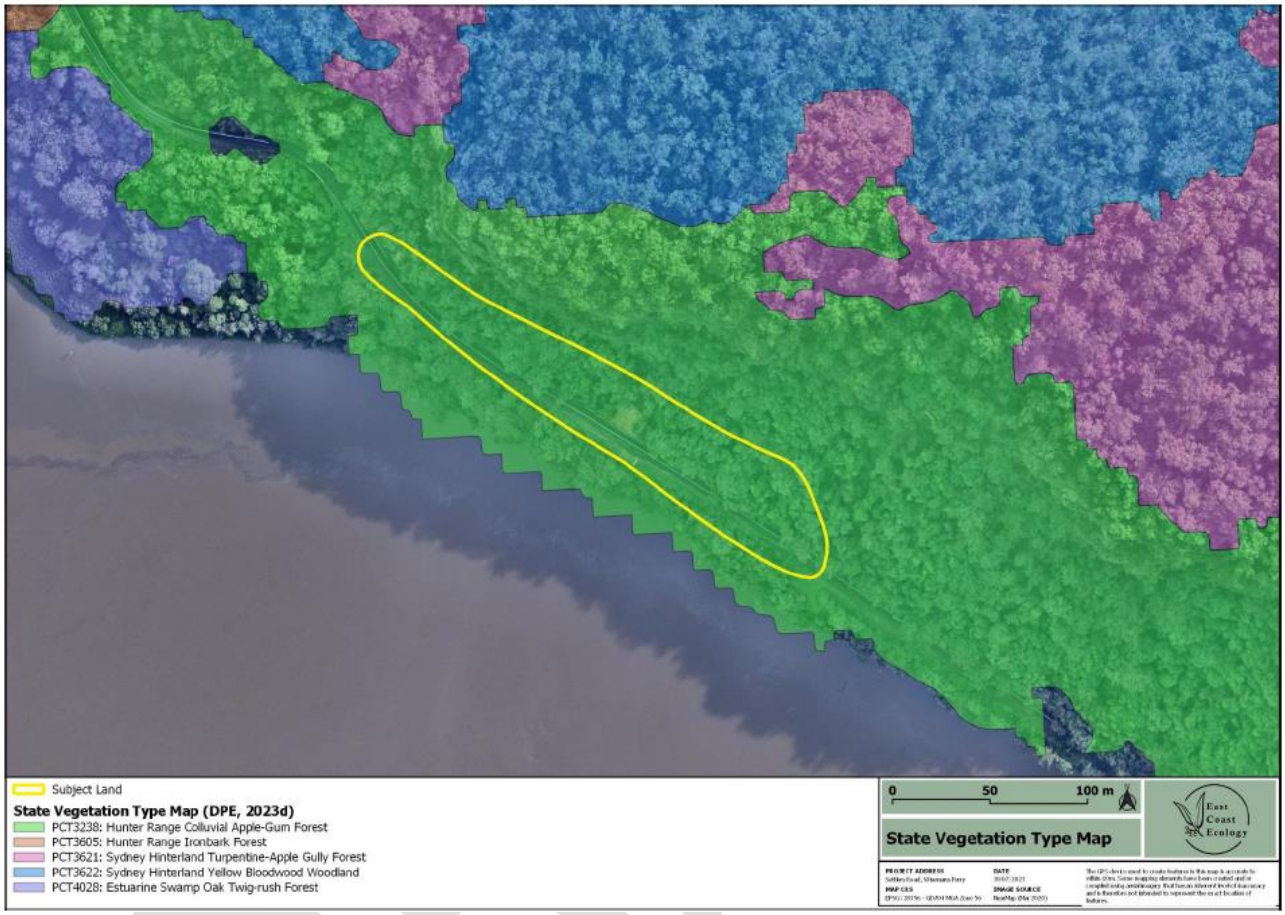


Figure 4-2 Mapped vegetation communities within/ surrounding the Subject Land.

The site assessment confirmed the presence of this community within the subject land. Approximately 0.78ha of this PCT are present within the subject land, as shown in Figure 4-3. This PCT is not listed under the BC Act (2016) or the EPBC Act (1999).

The vegetation within the Subject Land was generally in moderate condition, with localised patches of priority and environmental weeds mostly adjoining Settlers Road. Large landslips have devegetated the ground and mid-stratum throughout the Subject Land resulting in exposed rock and bare earth. Due to the presence of overhanging native canopy, they have been included within this vegetation type. Where landslips had occurred, the colonising species were dominated by environmental weeds.

Figure 4-3 Field validated vegetation within the subject land

Threatened flora

Database searches revealed 16 threatened flora have potential to occur within a ~5km radius of the Subject Land (Table 4-1).

No threatened flora species were identified within the Subject Land however, this does not rule out the potential for threatened species to still exist within the Subject Land, particularly threatened orchids, grasses and herbs. Within 500m of the Subject Land, records of one threatened flora species are known to occur:

- *Ancistrachne maidenii*

Based on habitat constraints, no threatened flora species were considered likely to occur within the Subject Land, particularly given the existing disturbed state.

Table 4-1 Threatened flora with potential to occur within the Subject Land.

Scientific Name	Common Name	BC Act	EPBC Act	Records within 5km
Acacia bynoeana	Bynoe's Wattle	E	V	5
Ancistrachne maidenii	-	V	-	30
Asterolasia elegans	-	E	E	72
Darwinia fascicularis subsp. oligantha	*Darwinia fascicularis subsp. oligantha* population in the Baulkham Hills and Hornsby Local Government Areas	E	-	2
Grammitis stenophylla	Narrow-leaf Finger Fern	E	-	2
Grevillea parviflora subsp. supplicans	-	E	-	1
Hibbertia spanantha	Julian's Hibbertia	E	CE	1
Lasiopetalum joyceae	-	V	V	3
Melaleuca deanei	Deane's Paperbark	V	V	3
Micromyrtus blakelyi	-	V	V	3
Olearia cordata	-	V	V	15
Pimelea curviflora var. curviflora	-	V	V	6
Pomaderris brunnea	Brown Pomaderris	E	V	2
Syzygium paniculatum	Magenta Lilly Pilly	E	V	1
Tetratheca glandulosa	-	V	-	20
Zieria involucrata	-	E	V	22

V – Vulnerable; E – Endangered; EP – Endangered Population; CE – Critically Endangered

Threatened fauna

Database searches revealed 38 threatened fauna occur, or have potential to occur, within a ~5km radius of the Subject Land (Table 4-2). The location of the previously identified threatened fauna species is included in Figure 4-4.

No threatened fauna species were identified within the Subject Land however, this does not rule out the potential for threatened species to still exist within the Subject Land, particularly given no targeted surveys were undertaken. Five (5) threatened fauna have the potential to occur within the Subject Land, based on habitat constraints and/ or historical records, that could be impacted by the activity. These species are:

- Amphibians:
    - *Pseudophryne australis* (Red-crowned Toadlet).
- Non-volant mammals:
    - *Cercartetus nanus* (Eastern Pygmy-possum).

- Volant mammals:
    - *Chalinolobus dwyeri* (Large-eared Pied Bat).
    - *Myotis macropus (*Southern Myotis).
- Reptiles:
    - *Varanus rosenbergi* (Rosenberg's Goanna).

Given the targeted nature of the activity (i.e. removal of disturbed ground stratum and structurally compromised damaged canopy) and large areas of potential habitat connected to the Subject Land, it was determined that the proposed activity is not likely to significantly impact upon any threatened fauna.

Table 4-2 Threatened fauna with potential to occur within the Subject Land.

Scientific Name	Common Name	BC Act	EPBC Act	Records within 5km
Heleioporus australiacus	Giant Burrowing Frog	V	V	1
Pseudophryne australis	Red-crowned Toadlet	V	-	11
Anthochaera phrygia	Regent Honeyeater	E	CE	1
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	2
Burhinus grallarius	Bush Stone-curlew	E	-	1
Callocephalon fimbriatum	Gang-gang Cockatoo	V	E	15
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	40
Chthonicola sagittata	Speckled Warbler	V	-	1
Daphoenositta chrysoptera	Varied Sittella	V	-	9
Glossopsitta pusilla	Little Lorikeet	V	-	3
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	11
Hieraaetus morphnoides	Little Eagle	V	-	4
Hirundapus caudacutus	White-throated Needletail	-	V	4
Ixobrychus flavicollis	Black Bittern	V	-	5
Lathamus discolor	Swift Parrot	E	CE	2
Ninox strenua	Powerful Owl	V	-	9
Pandion cristatus	Eastern Osprey	V	-	3

Petroica boodang	Scarlet Robin	V	-	1
Petroica phoenicea	Flame Robin	V	-	1
Pterodroma leucoptera leucoptera	Gould's Petrel	V	E	1
Tyto novaehollandiae	Masked Owl	V	-	3
Tyto tenebricosa	Sooty Owl	V	-	3
Pommerhelix duralensis	Dural Land Snail	E	E	3
Cercartetus nanus	Eastern Pygmy-possum	V	-	11
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	4
Dasyurus maculatus	Spotted-tailed Quoll	V	E	5
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	-	2
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	1
Myotis macropus	Southern Myotis	V	-	2
Petauroides volans	Southern Greater Glider	E	E	2
Petaurus australis	Yellow-bellied Glider	V	V	7
Phascogale tapoatafa	Brush-tailed Phascogale	V	-	3
Phascolarctos cinereus	Koala	E	E	9
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	3
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	1
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	1
Hoplocephalus bungaroides	Broad-headed Snake	E	V	1
Varanus rosenbergi	Rosenberg's Goanna	V	-	6

Migratory Species

Database searches revealed seven migratory terrestrial species (Table 4-3), or their habitat, are known to occur within the Subject Land. These species do not breed in Australia.

Table 4-3 Migratory terrestrial species with potential to occur in the Subject Land.

Species	EPBC Act Status
Cuculus optatus (Oriental Cuckoo)	Migratory, CAMBA, JAMBA, ROKAMBA
Hirundapus caudacutus (White-throated Needletail)	Vulnerable, Migratory, CAMBA, JAMBA, ROKAMBA
Monarcha melanopsis (Black-faced Monarch)	Migratory, Bonn
Monarcha trivirgatus (Spectacled Monarch)	Migratory, Bonn
Motacilla flava (Yellow Wagtail)	Migratory, CAMBA, JAMBA, ROKAMBA
Myiagra cyanoleuca (Satin Flycatcher)	Migratory, Bonn
Rhipidura rufifrons (Rufous Fantail)	Migratory, Bonn

CAMBA = China-Australia Migratory Bird Agreement, JAMBA = Japan-Australia Migratory Bird Agreement, ROKAMBA = Republic of Korea-Australia Migratory Bird Agreement and Bonn = Convention on the Conservation of Migratory Species of Wild Animals.

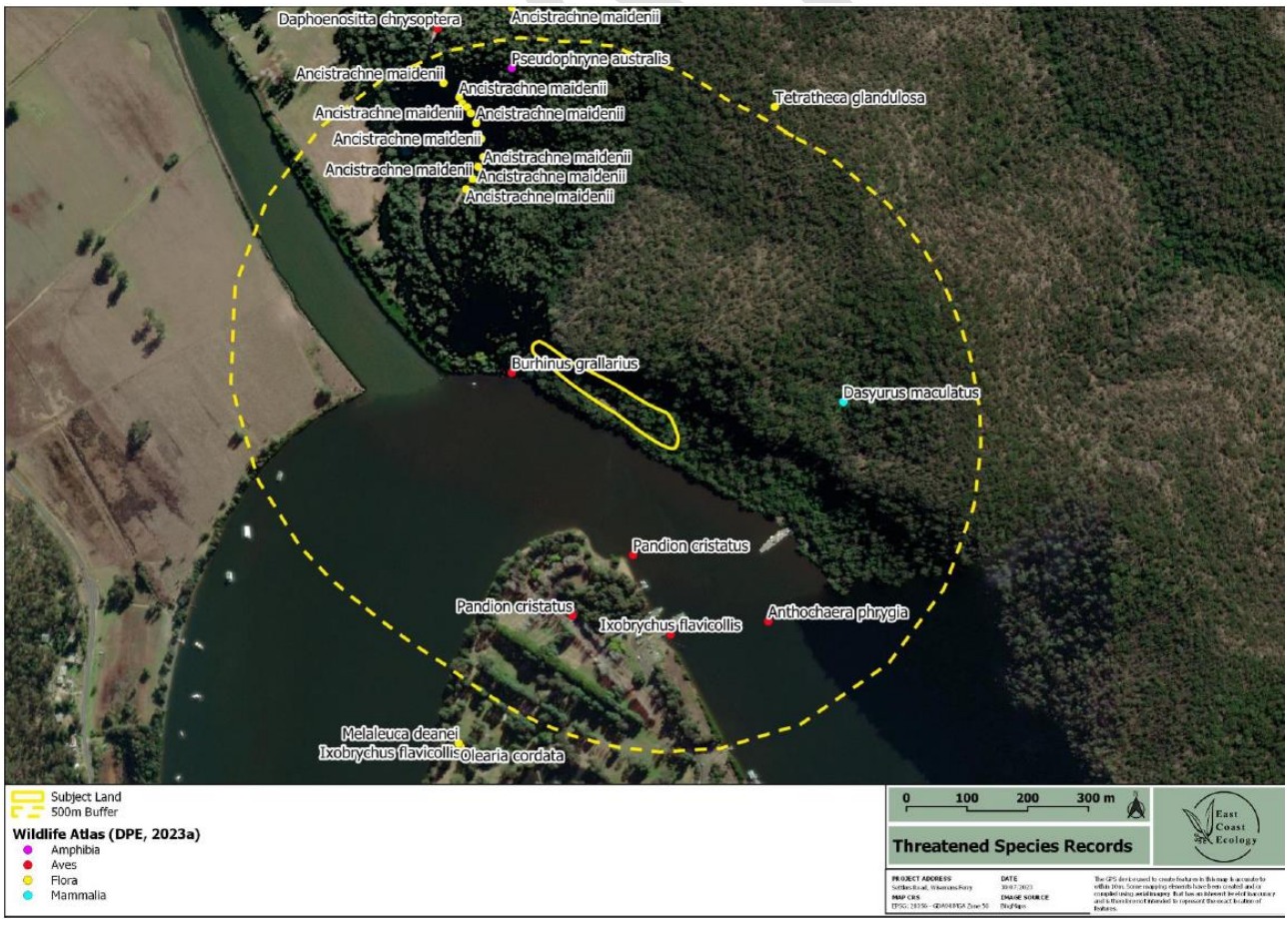


Figure 4-4 Threatened species records within proximity to the Subject Land.

4.1.2 Potential impacts

Summary

The primary direct ecological impact of the activity is clearing of native vegetation. The proposed activity will result in the removal of 0.78ha of PCT3238: Hunter Range Colluvial Apple-Gum Forest.

Vegetation within the Subject Land is generally in poor condition due to the landslip, characterised by dead or dying standing trees, recently fallen trees and completely devegetated areas where the landslip was most prominent. Early signs of revegetation appeared to be dominated by dominated by common environmental weeds.

Impacts to protected fauna

All vegetation proposed for removal provides minor foraging habitat for a suite of protected fauna species. Sensitive and/ or specialist fauna habitats that may be directly impacted by the activity include:

- Hollow-bearing trees (approximately 5 small hollows (<10cm diameter)
- Rocky habitats (boulders, and potentially some minor escarpment), and
- Leaf litter and woody debris.

Within the context of the surrounding landscape, these habitat types are unlikely to offer suitable habitat for threatened fauna owing to the proximity of the ongoing operational impacts created by traffic on Settlers Road, as well as the recent landslip. Furthermore, the extensive, superior habitat offered within the adjoining National Park means that threatened fauna are unlikely to occupy the Subject Land in preference of surrounding habitats.

Impacts to threatened species and communities

No threatened ecological communities were identified within the Subject Land, nor will any nearby be impacted by the proposed activity.

No threatened species were identified during the site assessment. The proposed activity has the potential to impact habitat for several species that have the potential to occur within the Subject Land, based on habitat constraints and could not be surveyed owing to the timing of the site assessment falling outside of the DPE endorsed survey periods. The result of a Test of Significance (5-Part Test) under the BC Act was that the proposed activity will not result in a 'significant impact' on any threatened entities and therefore the Biodiversity Offset Scheme is not triggered. As such, an SIS or a BDAR is not required. The result of an Assessment of Significance under the EPBC Act was that the proposed activity will not result in a 'significant impact' on any MNES and a referral to the Australian Government Minister for the Environment is not required.

Conclusion on significance of impacts

The proposed activity will impact approximately 0.78ha of native vegetation (PCT3238: Hunter Range Colluvial Apple-Gum Forest). No threatened flora or fauna species were identified within the Subject Land however, this does not rule out the potential for threatened species to still exist within the Subject Land, particularly cryptic species.

With the implementation of appropriate mitigation measures the proposed activity is expected to have a non-significant impact to protected biodiversity and is unlikely to significantly impact any threatened ecological community or species.

4.1.3 Safeguards and management measures

	Environmental Management Measures

Fauna and Flora	B1. Avoidance of native vegetation clearing outside the approved Project footprint (0.55 ha), and an exclusion zone (No-Go-Zone) will be established and marked to indicate the limit of clearing boundary. Note that the marking out of exclusion zone will be subject to a safety assessment by the Project geotechnical engineer to ensure the safety of the workers. B2. Prior to works, the applicant should commission the services of a qualified and experienced Ecological Consultant (minimum 3 years' experience) with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. B3. Where safe access is possible pre-clearing surveys would be undertaken by an ecologist for candidate threatened flora and fauna within the Project Footprint, prior to vegetation removal. The project ecologist is to mark and identify all hollow-bearing trees and stags identified within the Project Footprint as part of this assessment. B4. To compensate for the removal of hollows, artificial hollows (nest boxes or hollow-log tool) should be provided (1:1 ratio) within an appropriate location (outside of Dharug National Park). In preference, the artificial hollow should be installed outside the Subject Land, in an area where they are more likely to provide habitat for the threatened species they are targeting. B5. All habitat trees should be felled using a 'slow drop' technique, where possible. This involves knocking the trees to encourage any in situ fauna to vacate (e.g. using an excavator bucket) before slowly pushing the trees to the ground. Logs and log piles should be relocated outside of impact areas to minimise any loss of habitat. The use of the 'slow drop' technique will be dependent on the location of the hollow bearing tree and whether this can be done safely. B6. An unexpected threatened species finds protocol is to be adopted and, in the case where a threatened species is encountered on site during construction or clearing activities, the procedure followed. B7. Sedimentation and erosion control plan to be incorporated into the construction management plan. B8. Hygiene protocols are to be implemented onsite during construction to prevent the spread of zoonotic and fungus diseases, and soil pathogens. B9. Allocate all storage, stockpile, and laydown sites away from any vegetation that is planned to be retained. Avoid importing any soil from outside the site in order to avoid the potential of incurring indirect impacts on biodiversity values as this can introduce weeds and pathogens to the site. If materials are required to be imported for landscaping works, they are to be sterilised according to industry standards prior to importation to site. B10. Control measures (e.g. the directional lighting and task lighting) are to be installed to minimise glare and light spillage into adjoining vegetation to minimise potential impacts to fauna species.

4.2 Soil and Surface water

4.2.1 Existing environment

Topography

Settlers Road is located directly adjacent to the Hawkesbury River, near the confluence of the Macdonald River. The general topography of the area slopes steeply downwards towards the banks of the Hawkesbury River. At the location of the landslide Settlers Road has been cut through the landscape with a steep cut batter to the north and an equally steep fill batter to the south.

Geology and soils

The St Albans 1:100,000 Geological Series Sheet (NSW Department of Land and Water Conservation, 1997) indicates that the majority of the project area is underlain by geological units associated with the Watagan, and Wisemans Ferry Groups (Figure 4-5).

The Watagan soil group is prone to sheet erosion where groundcover is not maintained. The slip currently present at the site as a result of flooding is typical of the group along roadside batters.

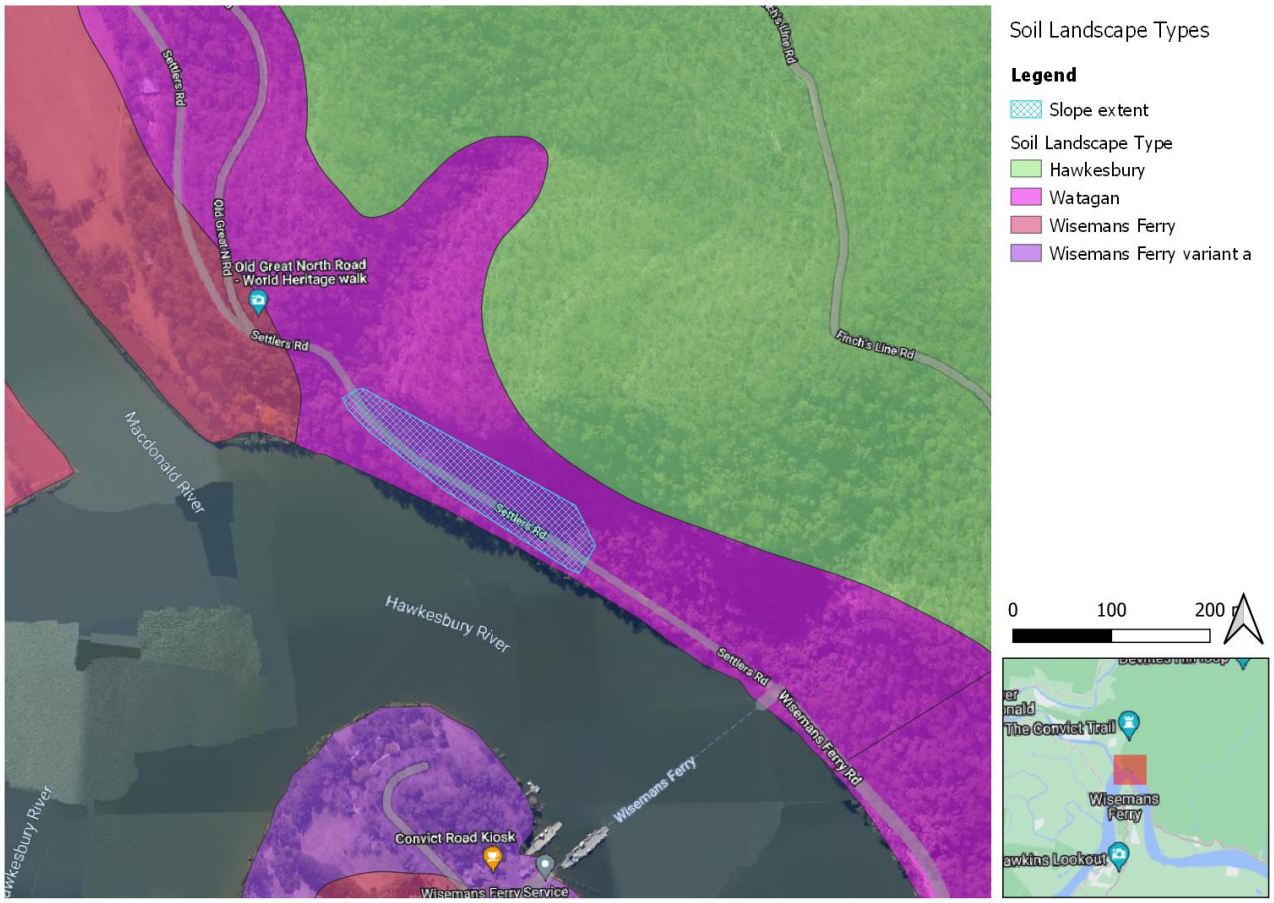


Figure 4-5 Soil types in the vicinity of the Project

Acid sulfate soils

Acid sulfate soils are the common name given to naturally occurring soils, commonly associated with low lying areas of fine-grained sediments and typically occur in lacustrine, estuarine, or swamp type environments, that contain iron sulfides (principally iron sulphide or iron disulphide or their precursors) which, on exposure to air, oxidise and create sulfuric acid.

Acid sulfate soil risk maps (Figure 4-6) were reviewed to determine the probability of acid sulfate soil being present across the project area. The project extent exists within an area categorised as Class 5, this classification is reflective of the area being less than 500m away from Class 1 and Class 2 areas to the south.

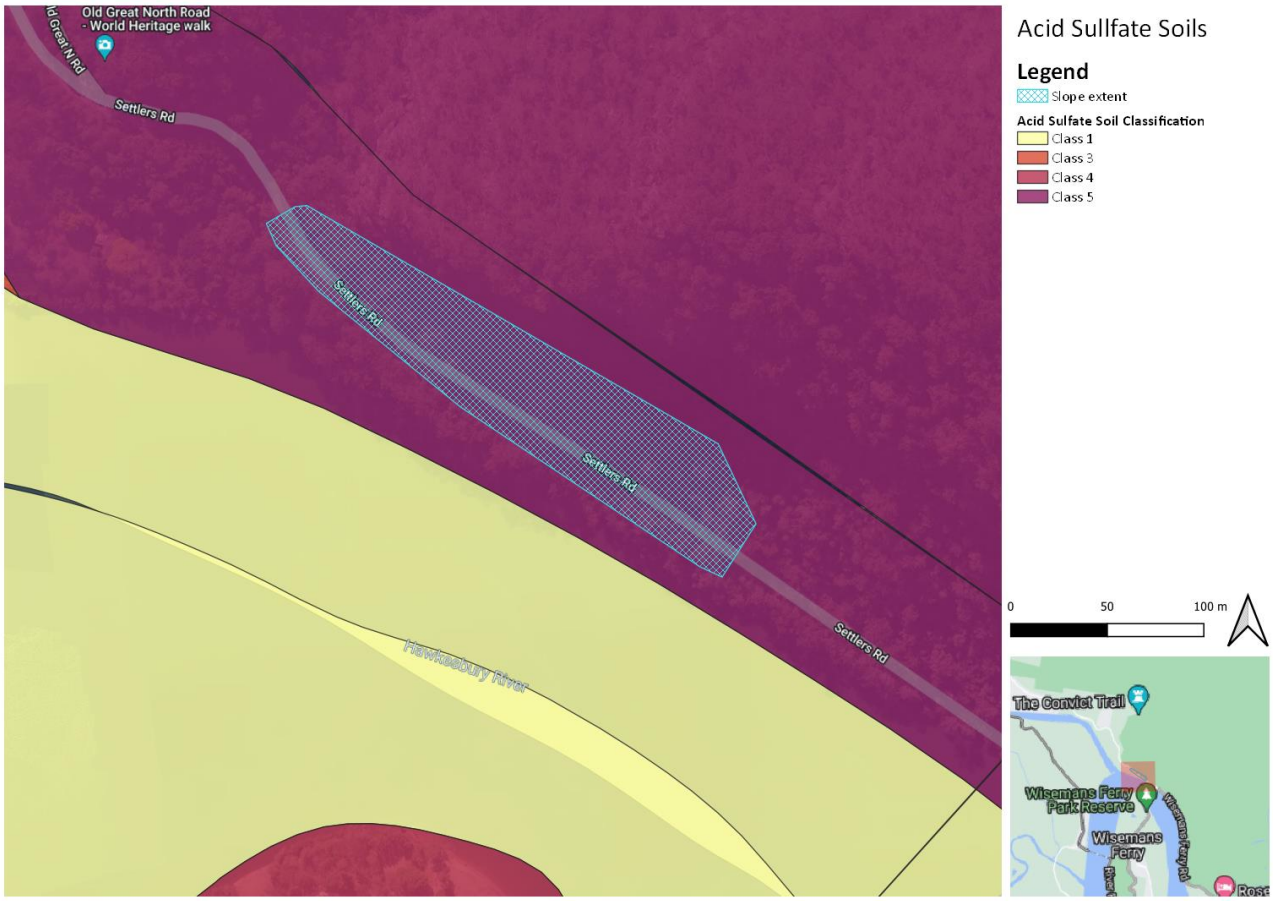


Figure 4-6 ASS classification in the vicinity of the Project.

Contamination

At the time of writing there is no evidence of contaminated land within or directly adjacent to the Project.

Surface water bodies

The Project work area is located directly adjacent to the Hawkesbury River to the south and MacDonald River to the North West.

Flooding

Settlers Road is not known to be prone to flooding, however in flood events the soils that underly the road are subject to degradation from significant run off to the north and rising river levels to the south. The SES flood depth mapping has been extracted from the SES and reproduced in Figure 4-7. While the road does not lie within flood risk areas, it is indirectly affected by flooding and storm events. The proposal is in relation to damage from flooding and heavy rains between 2021 and 2023 and would aim to safeguard against similar damage in future flood and storm events.

Figure 4-7 1% AEP Flood Mapping for Settlers Road (Source: www.ses.nsw.gov.au/hawkesbury-nepean-floods).

4.2.2 Potential impacts

Erosion and Sedimentation

The proposed remediation work would involve earthworks to remove vegetation, scale the slope and remove all unconsolidated soil. The temporary exposure of soil to water runoff and wind could increase soil erosion potential, particularly as the Watagan soil landscape is prone to erosion when ground cover is removed. There is the potential for exposed soils – and other unconsolidated materials, such as spoil, sand and other aggregates – to be transported from the construction site into the Macdonald or Hawkesbury Rivers.

In general, management and control of erosion and sedimentation for construction projects is well known, tried and proven. Standard management and mitigation measures are expected to be adequate in controlling any potential impacts.

Acid sulfate soils

Owing to the proximity of the Project to high-risk Acid sulfate soil areas, these is a minimal chance they will be encountered during excavation. If ASS is encountered Potential impacts may include:

- Damage to aquatic environments due to the release of sulfuric acid generated from oxidised acid sulfate soils during construction.

- Mobilisation of aluminium, iron and manganese from soils as a result of increased acidity from disturbance of acid sulfate soils.

If acid sulfate soils are encountered, they would be effectively managed in accordance with the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998b). The manual includes procedures for the investigation, handling, treatment and management of such soils.

Surface Water

Key risks to surface water quality during construction would be increased sediment, nutrient loadings and potential mobilisation of contaminants associated with the following:

- Site disturbance activities including:
    - Removal of vegetation and trees
    - Topsoil stripping
    - Soil stockpiling and transport
    - Mud tracking of exposed/dirt covered work areas
- Accidental spills or leaks from vehicles, plant and machinery used, stored or re-fuelled on site could pollute receiving waters.

Impacts to adjacent waterways are expected to be manageable through the implementation of standard management and mitigation measures.

4.2.3 Safeguards and management measures

	Environmental Management Measures
Erosion, Sedimentation and Water Quality	S1. Erosion and sediment control measures are to be implemented and maintained to: • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces • Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)). S2. An Erosion and Sediment Control Plan (ESCP) will be prepared and progressively updated throughout the proposed work, where required. The ESCP will be prepared in accordance with the Blue Book and Roads and Maritime Specification G38. S3. Erosion and sediment control measures will not be removed until the works are complete and the work areas are stabilised. S4. Weather forecasts will be checked regularly prior to and during works, works would be scheduled around forecast rainfall. S5. Where rainfall is predicted to exceed 10 millimetres, the work areas that are accessible should be set up to behave as a “clean” water areas and have all disturbed, and or, exposed surfaces covered and all loose material cleaned up and removed from the work area. S6. If Acid Sulfate Soils are found within the site boundaries, an Acid Sulfate Soil Management Plan must be prepared and implemented in line with relevant legislation and guidelines. S7. There is to be no release of dirty water into drainage lines and/or waterways. S8. Refuelling of plant and machinery must be undertaken off site or in an impervious double bunded area away from drainage lines. S9. Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc.) entering drain inlets or waterways.

4.3 Noise and vibration

4.3.1 Methodology

A desktop construction noise and vibration impact assessment was carried out for the proposal. The assessment was undertaken in general accordance with the following guidelines:

- NSW Department of Environment and Climate Change (DECC) Interim Construction Noise Guidelines (ICNG) 2009
- Roads and Maritime Construction Noise and Vibration Guidelines (CNVG) 2016
- NSW Department of Environment, Climate Change and Water (DECCW) Road Noise Policy (RNP) 2011

The operation of the proposal would not alter the existing noise environment and therefore an operational noise and vibration impact assessment has not been carried.

4.3.2 Existing environment

Typically, the noise environment in the area will correspond to the daily profile of the traffic movements along Settlers Road. It would be expected that the background noise levels along Settlers Road would be highest during the day-time and early evening, with a corresponding drop in noise levels between 8pm and 5am.

The location of sensitive receivers was determined through an inspection of aerial photography and available mapping data. For this assessment and based on the proximity of receivers to the minor works locations, the location of vibration and noise sensitive receivers will be the same. Land use in the vicinity of the proposal site comprises national park and rural land. The nearest residential dwellings are located around 400 metres from the proposal area.

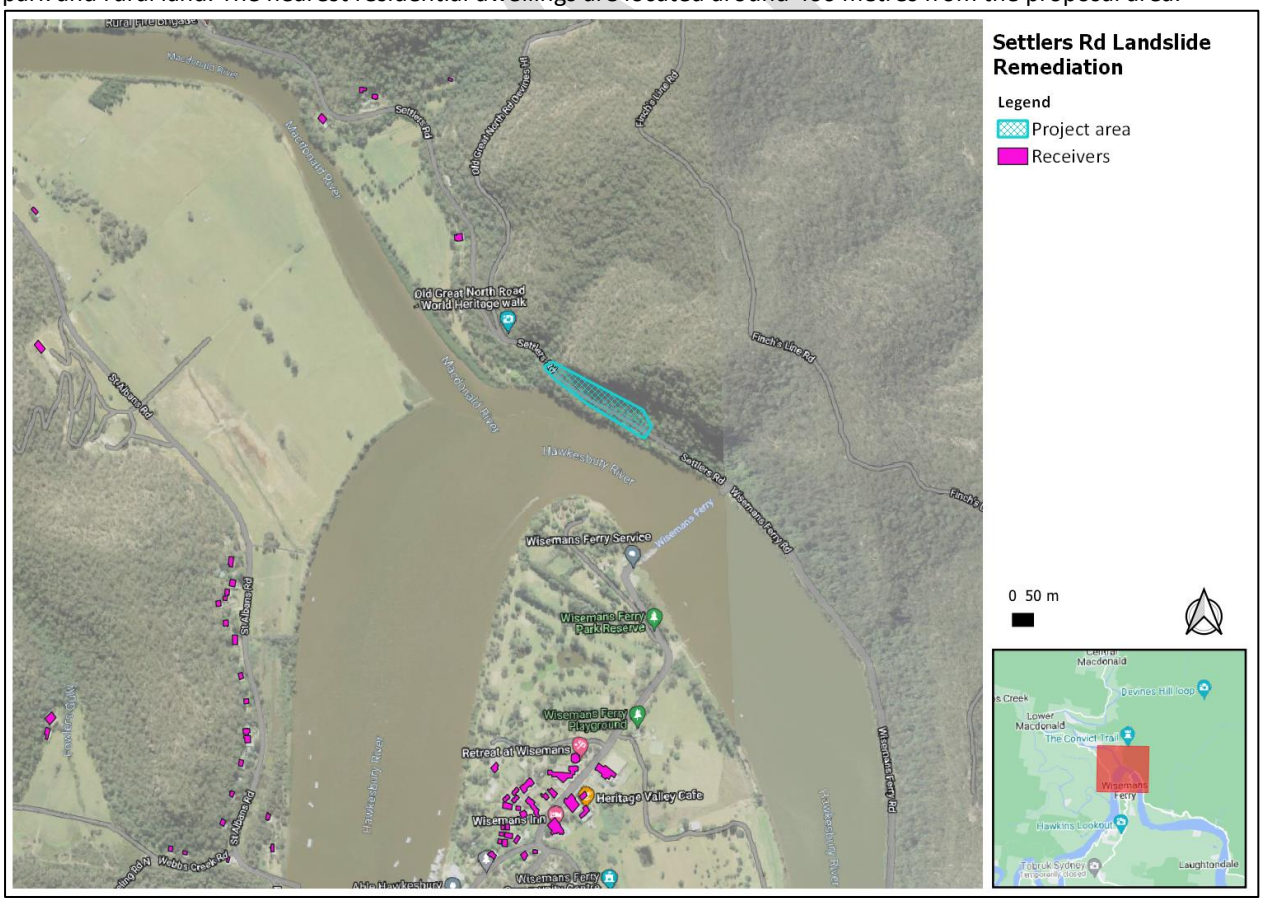


Figure 4-8 Receiver Buildings

4.3.3 Criteria

Background Noise Levels

The background noise levels along the study area have been estimated using the CNVG Representative Noise Environment guidance. The existing traffic levels on Settlers Road are a major contributing factor to the background noise environment. The R1 representative noise environment has been selected for the noise assessment owing to the rural nature of the area. The background noise levels corresponding to the R1 Noise Environment are provided in Table 4-4.

Table 4-4 Background Noise levels

R1 Noise Environment (dB(A))		
Day	Evening	Night
40	35	30

Noise Management Levels

In NSW, noise impacts arising from construction activities are managed in accordance with the ICNG. The guideline has been developed to assist with the management of noise impacts, rather than to present strict numeric noise criteria for construction activities. The ICNG recommends establishing Noise Management Levels (NMLs) at receiver locations adjacent to the works, using information from the existing background noise levels. Where the NML may be exceeded and there is potential for adverse noise impacts to occur, appropriate management measures would be implemented.

Table 4-5 details the method for determining NMLs for residential receivers only, during standard and nonstandard working hours. While there are separate criteria for non-residential receivers, residential dwellings and commercial properties were identified for the proposal.

Table 4-5 Construction noise management levels – residential receivers (ICNG, DECC 2009)

Hours	Noise Management Level (NML)	Description
Recommended standard hours: Monday to Friday 7am– 6pm Saturday 8am– 1pm No work on Sundays or public holidays)	Noise affected RBL +10 dB(A)	The noise affected level represents the point above, which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq\ (15\ min)}$) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of work to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected >75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for work near schools, or mid-morning or mid- afternoon for work near residences). 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside	Noise affected	A strong justification would typically be required for work outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable

recommended standard hours ('out-of- hours' work)	RBL +5 dB(A)	practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should then undertake negotiations with the community.

Using the background noise data from Table 4-4 and the ICNG requirements for residential receivers in Table 4-5, NMLs have been determined for the specified construction periods and are presented in Table 4-6**.**

Table 4-6 Construction NMLs

Receiver	Construction noise management level, L_{Aeq}(15min)					
	Standard recommended hours		Outside of standard recommended hours			
	Noise affected	Highly noise affected	Day	Evening	Night	Sleep disturbance
Commercial	70	-	-	-	-	-
Residential receivers	50	75	40	40	35	65

Sleep Disturbance

Noise impacts or events that can cause interruptions to sleeping patterns are considered separately to noise levels during works outside standard hours. The ICNG does not provide a specific method for assessment of potential sleep disturbance noise impacts; and guidance on the acceptability of these events is taken from the RNP.

The RNP provides targets for considering sleep disturbance impacts:

- Sleep disturbance screening criterion – used to identify situations where there is the potential for sleep disturbance.
- Sleep disturbance awakening criterion – levels below which awakening is unlikely to occur.

The sleep disturbance screening criterion recommends that where the $L_{A1\ (1\ minute)}$ does not exceed the $L_{A90,\ (15\ minute)}$ by 15 dB(A) or more, sleep disturbance impacts are likely to be maintained at an acceptable level. The $L_{A1,\ (1\ minute)}$ descriptor is meant to represent a typical maximum noise level when measured using a 'fast' time response. The sleep disturbance awakening guideline is the threshold at which an awakening reaction is likely to occur. Research discussed in the RNP identified this threshold to be an internal bedroom noise level of around 50 to 55 dB(A).

Windows often allow the greatest amount of sound transmission from outside to inside across a building facade. Allowing a 10 dB(A) reduction though an open window, external noise levels of about $L_{A1,\ 1\ min}$ 65 dB(A) would generally give rise to internal noise goal of up 55 dB(A). Where levels are lower than this, the sleep disturbance goals are expected to be met.

4.3.4 Potential impacts

The proposed activities and equipment needed for works are summarised in Table 4-7. Anticipated overall $L_{Aeq\ 15\ minute}$ sound power levels from equipment working during each activity are presented in the table, providing worst case emission estimates for the identified activities. Usage factors have been applied to the sound power levels to account for the expected proportion of 'on time' of each item of equipment over the assessment period.

Assumed sound power levels and the ultimate predicted noise levels will depend on the number of plant items operating at any one time and their precise location relative to a sensitive receiver. For this assessment, equipment was assumed to be working at the closest location relative to each receiver and represents a worst-case assessment. Where activity moves away from each receiver, or less equipment is operating, predicted levels will decrease accordingly.

SoundPlan, widely used noise modelling software, was used to calculate noise impacts in accordance with the ISO9613 prediction method, at all identified noise-sensitive receivers. The following components were incorporated in the model:

- Topography – Lidar data captured in 2015

- Construction noise sources –Activities and equipment were included in the noise model as area sources across the project. Noise sources are assumed to be present at any point within the project boundary.

Table 4-7 Indicative Activities and Equipment list

Phase	Activity	Equipment	SWL	Activity SWL
1	Site establishment- Vegetation removal and site preparation	Mobile Crane (20 tonne)	100	114
		Material Transport Vehicle	95	
		Hand tools	90	
		Chain saw (petrol)	114	
		Truck (10 tonne)	98	
		Excavator (6-8 tonne)	91	
2	Excavation/scaling	Excavator (6-8 tonne)	93	101
		Daymakers	93	
		Truck (10 tonne)	99	
		Hand tools	90	
3	Installation of rock bolts	Rock Anchor Drill*	104	105
		Hand Tools (electric)	90	
		Daymakers (4 Aspects)	93	
		Truck (10 tonne)	98	
4	Installation of debris fence	Elevated Working Platform	88	101
		Daymakers (4 Aspects)	93	
		Telehandler	99	
		Hand tools	90	
5	Finishing works	Telehandler	96	111
		Vibratory roller (4 tonne)*	105	
		Paving Machine	110	
		Tipper Truck	94	
		Daymakers	93	
*denotes equipment that has an added 5dB penalty to account for 'annoying' characteristics in line with the ICNG.				

The predicted noise contours for the proposal are presented in Figure 4-9. These contours represent the expected range of noise levels within the project area for the noisiest activity, Site establishment- Vegetation removal and site preparation.

Maximum noise levels are predicted to minimally exceed night-time NML's by between 5-10dB at a number of sensitive receivers opposite the Project across the Macdonald River and at Wisemans Ferry. Several sensitive receivers are expected to experience noise levels between 0-5 dB above the night-time NML. Sleep disturbance is not expected to occur as a result of the proposal as potential noise impacts to receivers are forecast well below 65dB(A).

The results demonstrate that during works it is unlikely that any residence will be significantly affected by noise originating from the proposed works. For out of hours work the risk of impact increases slightly, however it is very unlikely that any residences will be highly noise affected (>75 dB) at any time during the construction period. Despite this, as some works outside standard hours are required, programming should aim to complete noisy activities either in daytime hours or as early in the evening or night as possible.

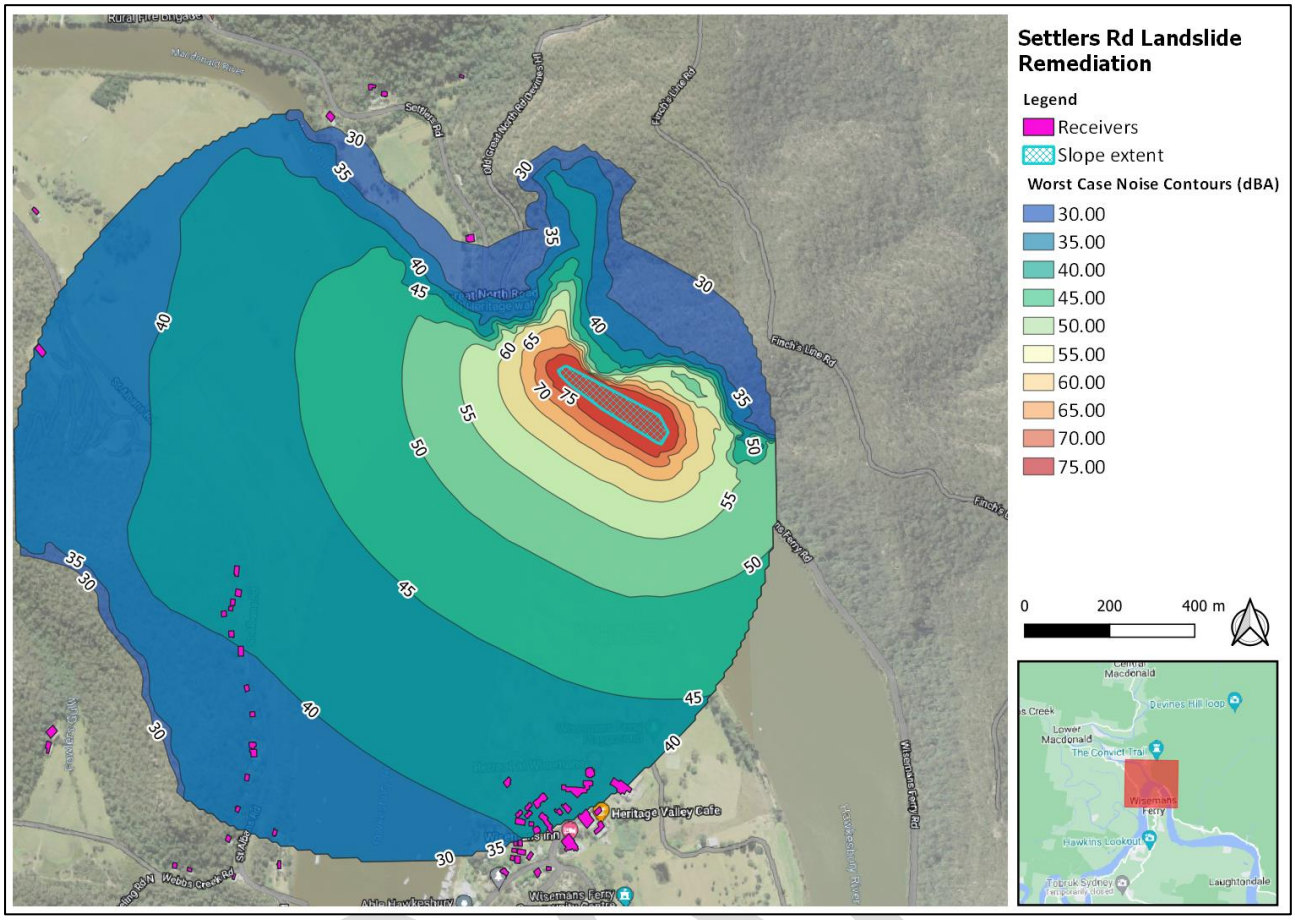


Figure 4-9 Noise Impact Contours

4.3.5 Safeguards and management measures

	Environmental Management Measures
Noise and Vibration	N1. Avoid swearing and unnecessary shouting or loud stereos/radios onsite. N2. No dropping of materials from height, throwing of metal items and slamming of doors. N3. Priority will be given to the use of quieter and less vibration emitting construction methods and plant alternatives. N4. All potentially affected residents will be informed at the commencement of works, working hours adhered to and the level and duration of noise to expect during construction. N5. Noisy activities would be scheduled to occur in the daytime where possible to avoid undue disturbance to surrounding residences.

4.4 Other impacts

4.4.1 Existing environment and potential impacts

Environmental factors with negligible to minor impacts can be assessed in the table below.

Environmental factor	Existing environment	Potential impacts
Non-Aboriginal Heritage	One non-listed heritage item is located directly adjacent to the slope. The Thomas James Bridge was constructed in 1830 as part of the Great North Road project using convict labour. The bridge is not heritage listed and sits outside the heritage boundaries for the following listings: Old Great North Road Hawkesbury LEP I0091, Roadworks Central Coast LEP I65, Old Great North Road Between Devine's Hill and Mount Manning SHR#00991, Old Great North Road NHL 105961 and Australian Convict Sites (Old Great North Road) WHL 106209. A large portion of Settlers Road, including the project area is however within the buffer zone of the Australian Convict Sites (Old Great North Road Buffer Zone) World Heritage Site. Remediation work is expected to be occurring on Thomas James Bridge at the time of the Project. This remediation work is similarly to rehabilitate the bridge and surrounding area after the heavy rainfall events of 2022.	The proposed work to rehabilitate the landslide along Settlers Road is unlikely to have a negative impact on the heritage values of the area as a whole. The project would help to preserve adjacent heritage items by rehabilitating the road to prevent further major landslides that could impact the heritage fabric adjacent items such as Thomas James Bridge. Overall, there is not expected to be any impacts to the locally listed heritage items adjacent to the proposal, or the World Heritage listing from the proposal.
Aboriginal Heritage	An Aboriginal heritage due diligence assessment has been undertaken for the proposal. This is attached as Appendix D. Database searches were carried out using the AHIMS system. These searches noted 13 Aboriginal Heritage sites within a 4km radius of the project area. Despite this the due diligence assessment noted the following: *"Based on the findings of previous archaeological assessments, the most common site types in the vicinity of the study area are closed context rock shelters with art in the steeper sandstone creek*	The due diligence assessment noted that the study area was assessed under the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (OEH 2010a). No Aboriginal objects, archaeological sites or areas of archaeological potential were identified within the study area as a result of the due diligence assessment. Background research including AHIMS and other database searches, and review of previous archaeological investigations, did not identify any archaeological sites within the study area. Visual inspection confirmed that the study area has been disturbed by land use practices, natural

Environmental factor	Existing environment	Potential impacts
	valleys. Open context engraving and grinding groove sites also occur on the ridge crests and upper slopes. The majority of the current study area has been subject to disturbance related to the existing road corridor, bridge construction and natural erosional processes, leading to a very low likelihood of any intact open context artefact sites within the study area."	erosional and colluvial processes and construction of the existing road alignment. It is therefore reasonable to assume that no Aboriginal objects or sites would be affected by the proposed remediation works within the study area. Based on the results of this assessment there are no Aboriginal archaeological heritage constraints to the proposal and according to the Heritage NSW Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales, works can proceed with caution.
Air Quality	Air quality in a region is influenced by a number of factors including the terrain, meteorology (weather patterns), historical trends in road traffic emissions and the current (ambient) and historical air quality environment. The Project is expected to involve earth moving activities and lead to an influx in heavy vehicles. These both have the potential to impact air quality in the immediate vicinity of construction activities.	During construction some short-term localised impacts on air quality could be expected. These impacts are likely to be caused by emissions and generation of dust during the operation of plant and equipment. Providing that the appropriate safeguards are implemented, it is not expected that there would be any significant adverse impact on air quality during construction.
Landscape and Visual Characteristic	The project footprint is directly adjacent to the Macdonald and Hawkesbury Rivers which is a major element of the landscape of the Hawkesbury Region. The landscape is dominated by the rivers and bushland to the north-east.	Overall, the proposed work is likely to have minor short-term impacts to the visual/scenic landscape owing to the requirement for vegetation clearing prior to remediation works. The clearing of vegetation along the landslide is not expected to be a long-term impact as the area would be left to revegetate naturally. In its current state the slope already provides a significantly different outlook than was present prior to flooding. The addition of the protective rock screen is unlikely to have a significant visual impact for motorists travelling along Settlers Road. The shotcreted area of the lower slope is expected to have a minor negative impact to the visual amenity of this section of Settlers Road, particularly when compared to the previously vegetated slope, however, colouring the

Environmental factor	Existing environment	Potential impacts
		shotcrete a dark recessive colour would minimise the potential impact. The necessity of the shotcrete to ensure the ongoing stability of Settlers Road and the ongoing safety of the road users outweighs the minor visual impact in this instance.
Traffic Management	Settlers Road is primarily used by light vehicles, a number of heavy vehicles likely use the road for deliveries to residences and businesses in the area. Settlers Road does not have a dedicated pedestrian path. As such it is not frequented by pedestrians. Additionally, owing to the rural location it is not a common thoroughfare for cyclists.	The work would temporarily increase heavy vehicle movements in the area owing to spoil handling, delivery of materials and plant. The Project would additionally require the closure of Settlers Road to traffic at times, while works high risk activities are taking place. While this would inconvenience the local community, construction would take place 24/7 to ensure the expedited remediation of the slope and road surface.
Land use and Property	The project would not lead to changes to land use in the locality. There are gravel and sealed driveways to access the private properties. Consultation with neighbouring landowners will be conducted prior to works commencing.	During the construction phase, access to all properties will be maintained to ensure minimal disruption to the residents.
Waste	The proposal would not generate a significant amount of waste material. Any surplus material will be correctly classified in accordance with NSW EPA Waste Classification Guidelines disposed of at an appropriately licenced facility. Construction would generate waste streams typical of road infrastructure maintenance including: • Green waste from cleared vegetation. • Oil, grease and other liquid wastes from the maintenance of construction plant and equipment. • General wastes and sewage from port-a-loos. • Concrete waste.	The volumes and types of waste generated by the proposal would be readily managed through the application of standard mitigation measures.
Cumulative Impacts	The proposal would be occurring at a similar time to the rehabilitation of Thomas James Bridge. These works are programmed to overlap as much as practicable	

Environmental factor	Existing environment	Potential impacts
	and safe to expedite the overall remediation of Settlers Road and allow for normal, pre flood, access to be reinstated. Cumulative impacts may result owing to the overlap in the work schedule. The benefits of expediting the work in this case is deemed to outweigh impacts from working in tandem.	

5 Environmental management

This chapter describes how the proposal will be managed to reduce potential environmental impacts throughout detailed design, construction and operation. A summary of site-specific environmental safeguards is provided and the licence and/or approval requirements required prior to construction are also listed.

5.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in the REF in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these safeguards and management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.
A Construction Environmental Management Plan (CEMP) will be prepared to describe the safeguards and management measures identified. The CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by Hawkesbury Council prior to the commencement of any on-site work. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements.

5.2 Summary of safeguards and management measures

Environmental safeguards and management measures outlined in this REF will be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed work on the surrounding environment. The safeguards and management measures are summarised in Table 5-1.

Table 5-1: Summary of safeguards and management measures

Safeguards for the proposed work	
Fauna and Flora	B1. Avoidance of native vegetation clearing outside the approved Project footprint (0.55 ha), and an exclusion zone (No-Go-Zone) will be established and marked to indicate the limit of clearing boundary. B2. Prior to works, the applicant should commission the services of a qualified and experienced Ecological Consultant (minimum 3 years' experience) with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. B3. Where safe access is possible pre-clearing surveys would be undertaken by an ecologist for candidate threatened flora and fauna within the Project Footprint, prior to vegetation removal. The project ecologist is to mark and identify all hollow-bearing trees and stags identified within the Project Footprint as part of this assessment. B4. To compensate for the removal of hollows, artificial hollows (nest boxes or hollow-log tool) should be provided (1:1 ratio) within an appropriate location (not within the bounds of Dharug National Park). In preference, the artificial hollow should be installed outside the Subject Land, in an area where they are more likely to provide habitat for the threatened species they are targeting. B5. All habitat trees should be felled using a 'slow drop' technique. This involves knocking the trees to encourage any in situ fauna to vacate (e.g. using an excavator bucket) before slowly pushing the trees to the ground. Logs and log piles should be relocated outside of impact areas to minimise any loss of habitat. B6. An unexpected threatened species finds protocol is to be adopted and, in the case where a threatened species is encountered on site during construction or clearing activities, the procedure followed B7. Sedimentation and erosion control plan to be incorporated into the construction management plan B8. Hygiene protocols are to be implemented onsite during construction to prevent the spread of zoonotic and fungus diseases, and soil pathogens B9. Allocate all storage, stockpile, and laydown sites away from any vegetation that is planned to be retained. Avoid importing any soil from outside the site in order to avoid the potential of incurring indirect impacts on biodiversity values as this can introduce weeds and pathogens to the site. If materials are required to be

	imported for landscaping works, they are to be sterilised according to industry standards prior to importation to site. B10. Control measures (e.g. the directional lighting and task lighting) are to be installed to minimise glare and light spillage into adjoining vegetation to minimise potential impacts to fauna species.
Erosion, Sedimentation and Water Quality	S1. Erosion and sediment control measures are to be implemented and maintained to: • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces • Divert clean water around the site (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)). S2. An Erosion and Sediment Control Plan (ESCP) will be prepared and progressively updated throughout the proposed work, where required. The ESCP will be prepared in accordance with the Blue Book and Roads and Maritime Specification G38. S3. Erosion and sediment control measures will not be removed until the works are complete and the work areas are stabilised. S4. Weather forecasts will be checked regularly prior to and during works, works would be scheduled around forecast rainfall. S5. Where rainfall is predicted to exceed 10 millimetres, the work area would need to be set up to behave as a "clean" water area and have all disturbed, and or, exposed surfaces covered and all loose material cleaned up and removed from the main channel area. S6. If Acid Sulfate Soils are found within the site boundaries, an Acid Sulfate Soil Management Plan must be prepared and implemented in line with relevant legislation and guidelines. S7. There is to be no release of dirty water into drainage lines and/or waterways. S8. Refuelling of plant and machinery must be undertaken off site or in an impervious double bunded area away from drainage lines. S9. Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc.) entering drain inlets or waterways.
Aboriginal Heritage	AH1. If any archaeological remains are discovered during works, work will cease immediately, and the discovery reported to the Council's Heritage Adviser and the National Parks and Wildlife Service.
Non-Aboriginal Heritage	H1. In the event that unexpected Non-Aboriginal items are located during the works all works will cease immediately and Council's Heritage Adviser or Heritage Council shall be contacted.
Noise and Vibration	N1. Avoid swearing and unnecessary shouting or loud stereos/radios onsite. N2. No dropping of materials from height, throwing of metal items and slamming of doors.

	N3. Priority will be given to the use of quieter and less vibration emitting construction methods and plant alternatives. N4. All potentially affected residents will be informed at the commencement of works, working hours adhered to and the level and duration of noise to expect during construction. N5. Noisy activities would be scheduled to occur in the daytime where possible to avoid undue disturbance to surrounding residences.
Air Quality	A1. Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust A2. Vegetation or other materials are not to be burnt on site. A3. Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation. A4. Stockpiles or areas that may generate dust are to be managed to suppress dust emissions in accordance with the Blue Book (Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines)
Landscape and Visual Character	V1. Shotcrete will be colours and shaped to blend in with the natural surroundings. The shotcrete colour will be a recessive colour to better blend with the local area, dark vegetation and soil colours and shadows that are present on the slope for long periods of the day and year.
Traffic Management	T1. Where possible, current traffic movements and property accesses are to be maintained during the works. Any disturbance is to be minimised to prevent unnecessary traffic delays.
Land Use and Property	Nil
Waste	WR1. Resource management hierarchy principles are to be followed: a. Avoid unnecessary resource consumption as a priority; b. Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery); c. Disposal is undertaken as a last resort (in accordance with the *Waste Avoidance & Resource Recovery Act 2001*). WR2. There would be no illegal disposal or re-use of construction waste onto other land. WR3. Waste is not to be burnt on site. WR4. Waste material would not be left on site at the completion of works. WR5. Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day. WR6. Waste would be disposed of in accordance with the *Waste Classification Guidelines* (EPA, 2014).

5.3 Licensing and approvals

Table 5-2: Summary of licensing and approvals required

Instrument	Requirement	Timing
Roads Act 1993	*Road Occupancy Licence*	*Prior to the start of construction*

6 Conclusion

This chapter provides the justification for the proposal taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in Section 193 of the Environmental Planning and Assessment Regulation 2021.

The proposed slope stabilisation works is subject to assessment under Division 5.1 of the EP&A Act. The REF has fully examined and considered all possible matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration (where relevant) of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal as described in the REF best meets the project objectives but would still result in some impacts on traffic and access, biodiversity noise and landscape character. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. On balance the proposal is considered justified and the following conclusions are made.

6.1 Justification

Severe wet weather throughout 2022 and 2023 have caused slope instability along Settlers Rd, Wisemans Ferry. The road is currently still open to the public, however there is a risk that the slope will continue to become more unstable and pose a greater safety concern to the public.

6.1.1 Social factors

The proposal is expeected to have negligible negative social implications. It is recognised that the proposal will have some impacts to road users during construction as a result of lane closures. Impacts would include negligible visual impacts, traffic impacts and noise impacts, particularly during night works. However impacts would be temporary in nature. The safeguards and mitigation measures included in the environmental assessment (refer to section 4) would minimise impacts during construction.

There would however be positive social implications by undertaking this proposal. Increasing the stabiliy of the slope will reduce the risk of rock falls, subsequently improving the safety of road users.

6.1.2 Biophysical factors

The proposal would only have minimial biophysical impacts- with the removal of about 0.78 ha of native vegetation (refer to section 3.1**Error! Bookmark not defined.Error! Reference source not found.**). Vegetation removal would only occur in a sections of the slope that have been directly impacted by the slope instability and is unlikely to include any endangered or threatened ecologcial communities.

6.1.3 Economic factors

By undertaking this proposal HCC and CCC also reduce the ongoing costs and risks to road users associated with the existing maintenance regime at the slope.

6.1.4 Public interest

The proposal would be of public interest due to the safety benefit it would provide. The proposal would increase the stabiliy of the slope and reduce the risk of rock falls, subsequently improving the safety of road users.

6.2 Objects of the EP&A Act

Table 6-1 Objects of the Environmental Planning and Assessment Act 1979

Instrument	Requirement
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposal improves road safety for users of Settlers Road. Including users of the National Park.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	Ecologically sustainable development has been considered throughout the proposal, with the legislative context of ecological sustainable development considered in section 3.1 and the impact of the overall proposal and the REF proposal is considered in detail in section 4. An options process was also undertaken for the proposal that has considered a range of constraints (refer Section 1.4) Outcomes of further investigations would be considered as part of detailed design, constructability assessments and the construction contractor's construction environmental management plans. Mitigation measures are proposed to be implemented to minimise direct and indirect impacts of the proposal.
1.3(c) To promote the orderly and economic use and development of land.	Improving this site would support the use of the road and access to the Dharug National Park. The proposal would also improve safety and reduce the ongoing costs and risks to road users
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the proposal.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Construction of the proposal would require the removal of trees. This does not include any endangered or threatened ecological communities. The impacts to vegetation have been minimised where possible. The safeguards and mitigation measures included in the environmental assessment (refer to section 4) would further minimise these risks
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The proposal is considered to have no heritage impacts.
1.3(g) To promote good design and amenity of the built environment.	The proposal has been developed with the aim to minimise the overall impact of the proposal on existing landscape character of the site. However, construction of the proposal would result in negligible unavoidable visual impacts.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the proposal
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposal.

Instrument	Requirement
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Section 3 outlines the community and stakeholder consultation carried out during various stages of the proposal.

6.2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the project.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are discussed below.

The precautionary principle

The precautionary principle deals with reconciling scientific uncertainty about environmental impacts with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

This principle was considered during options development (refer to Chapter 2). The precautionary principle has guided the assessment of environmental impacts for this REF and the development of mitigation measures.

- The best-available technical information, environmental standards and measures have been used to minimise environmental risks.
- Specialist studies were incorporated to gain a detailed understanding of the existing environment.

Intergenerational equity

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations.

The proposal would maintain safe road usage along the road for use for future generations. The proposal would also protect the safety of future generations by maintaining the integrity of the rock structure at the site. The proposed scope of works is minor and would not impact on biological diversity or ecological integrity.

Conservation of biological diversity and ecological integrity

The proposal will result in minor biodiversity and ecological integrity impacts. Of the options considered, the selected option has the smallest impact while still achieving the proposal goals.

Improved valuation, pricing and incentive mechanisms

The principle of internalising environmental costs into decision making requires consideration of all environmental resources that may be affected by the carrying out of a proposal, including air, water, land and living things.

Valuation of environmental resources has shaped the proposal and mitigation measures. The proposal demonstrates value to the community in regard to improved safety. The design of the proposal has considered all environmental impacts and have tried to reduce impacts to the greatest extent practicable.

6.3 Conclusion

The proposed remediation of a section of Settlers Road, Wisemans Ferry that was damaged by a serious landslide during the severe weather event is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration (as relevant) of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the EPBC Act.

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal as described in the REF best meets the project objectives but would still result in some potential impacts on Flora and Fauna, Traffic and Transport, and Noise and Vibration. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would restore the damaged slope and reinstate the road to full working order, allowing the community to once again us Settlers Road at normal capacity. On balance the proposal is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposal is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

Significance of impact under Australian legislation

The proposal is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Government Department of Agriculture, Water and Environment is not required.

7 Certification

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

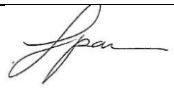
Completed By:

Name	Aidann Stathis
Signature	
Position	Environmental Consultant – Hutchison Weller Pty Ltd
Date	

Checked by:

Name	Cameron Weller
Signature	
Position	Principal Environmental Consultant – Hutchison Weller Pty Ltd
Date	

Approved by:

Name	Jay Spare
Signature	
Position	Unit Manager Roads and Drainage Infrastructure Central Coast Council
Date	12/09/2023

Appendix A

Consideration of clause 228(2) factors and matters of national environmental significance and Commonwealth land

Clause 228(2) Checklist

In addition to the requirements of the *Is an EIS required?* guideline (DUAP 1995/1996) and the *Roads and Related Facilities EIS Guideline* (DUAP 1996) as detailed in the REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposal on the natural and built environment.

Factor	Impact
a) Any environmental impact on a community? The construction of the proposal may cause minor short-term environmental impacts on the community, such as delays to traffic, however the potential impacts would be managed with the implementation of the safeguards detailed in Section 3. The operation of the proposal would have a beneficial environmental impact on the community in the long-term from the reduced risk of road failure and re-establishment of normal travelling conditions along the road.	Short-term, minor, negative Long-term, positive
b) Any transformation of a locality? The construction of the proposal would result in temporary impacts for the existing locality, predominantly through negative visual amenity impacts associated with the placement and movement of construction plant and equipment, as well as the removal of vegetation.	Short-term, minor, negative
c) Any environmental impact on the ecosystems of the locality? The minor vegetation removal is considered to have a negligible impact on the ecosystems of the locality, however any potential impacts would be minimised with the implementation of the safeguards given in Section 3 of this REF.	Minor, negative
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The construction of the proposal may result in reduction of aesthetic quality due the construction activities and equipment visible to residential and surrounding viewpoints. Dust and noise generation may potentially cause short-term impacts to environmental quality, however these impacts would be managed with the implementation of the safeguards detailed in Section 3.	Short-term, minor, negative
e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The proposal is unlikely to negatively affect any locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations.	Nil
f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974)?* The proposal is unlikely to significantly impact on the habitat of any protected fauna.	Nil
g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The proposal would not endanger any species of animal, plant or other life form, whether living on land, in water or in the air.	Nil
h) Any long-term effects on the environment? The proposal would have positive long-term effects on the environment due to improved safety for road users and reduced risk of erosion /failure of the slope.	Long-term, positive

Factor	Impact
i) Any degradation of the quality of the environment? The construction of the proposal may potentially degrade the quality of the environment through minor accidental spills, erosion and sediment, and dust generation issues. These potential impacts would be managed with the implementation of the safeguards detailed in Section 3.	Short-term, minor, negative
j) Any risk to the safety of the environment? The construction of the proposal may potentially impact on safety of the environment due to road works and the movement of construction plant and equipment. The operation of the proposal would have a beneficial impact on the safety of the environment due to the reduced risk of slope failure and provision of safer travelling conditions for road users.	Short-term, minor, negative Long-term, positive
k) Any reduction in the range of beneficial uses of the environment? The construction of the proposal would result in a disruption to road use due to lane closures, potentially increasing travel time for road users	Short-term, minor, negative
l) Any pollution of the environment? The construction of the proposal may potentially result in pollution to the environment through minor accidental spills, erosion and sediment, and dust generation issues. These potential impacts would be managed with the implementation of the safeguards detailed in **Section 3.**	Short-term, minor, negative
m) Any environmental problems associated with the disposal of waste? Contaminated waste is not anticipated to be encountered during the proposed work. Any waste generated during construction of the proposal will be reused, recycled or disposed of appropriately in accordance with the safeguards detailed in **Section 3.**	Short-term, minor, negative
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The required quantities of resources for the Project of would not create any significant demands on these resources.	Nil
o) Any cumulative environmental effect with other existing or likely future activities? The proposal would not result in any cumulative environmental effects with other projects as no projects are currently or known to be occurring in the vicinity of the project in the future.	Nil
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposal is not located near the coast and therefore has no impact on coastal processes.	Nil

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on the Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Agriculture, Water and Environment.

A referral is not required for proposed actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. Impacts on these matters are still assessed as part of the REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
a) Any impact on a World Heritage property?	Nil
b) Any impact on a National Heritage place?	Nil
c) Any impact on a wetland of international importance?	Nil
d) Any impact on a listed threatened species or communities?	Nil
e) Any impacts on listed migratory species?	Nil
f) Any impact on a Commonwealth marine area?	Nil
g) Does the proposal involve a nuclear action (including uranium mining)?	Nil
h) Additionally, any impact (direct or indirect) on the environment of Commonwealth land?	Nil

Appendix B

Biodiversity Assessment

Appendix C

Non-Aboriginal Heritage Searches

Appendix D

Aboriginal Heritage Due Diligence Assessment